

ITTO Tropical Forest

UPDATE

Volume 11 Number 2 2001

A newsletter from the International Tropical Timber Organization to promote the conservation and sustainable development of tropical forests



Catching on to reduced impact logging

THE IDEA of reduced impact logging (RIL) seems to be catching on at last. Only a handful of companies might actually be practising it, but the buzz it is creating is as loud as a forest full of chainsaws.

RIL brings with it both satisfaction and pain. The satisfaction is derived from the more efficient use of personnel and machines, less wastage of timber and, of course, a healthier residual forest. The pain is inflicted mostly by the bottom line: according to articles published in this edition, the up-front costs of RIL, particularly those incurred in training and planning, are usually higher than those associated with 'conventional' logging. Moreover, RIL requires a new approach to management: the officials and managers charged with its introduction must be imaginative and flexible if they are to avoid being hurt by the process.

The mounting interest in RIL was obvious at a recent conference on the subject hosted by the Sarawak Timber Association and supported by FAO, ITTO and a number of other institutions (page 24 presents a full list of organisers and the conference's recommendations). Attended by more than 260 RIL enthusiasts and skeptics, it left the impression that RIL has arrived as a phenomenon and its uptake is increasing. Particularly notable were the presentations of several logging companies showing the positive steps they are taking to improve their ways (see, for example, articles on pages 6-7 and 19). It's too early to say that a revolution in attitude is taking place in the sector, but the signs are positive.

Assistance from international development agencies is proving useful in the start-up phase of RIL (see, for example, pages 10-11).

For its part, ITTO has funded 35 forests for the demon-▶



Inside ▶ reduced impact logging ▶ outcomes of the latest Council session ▶ more ...

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Publishing and distribution coordinated by Anutech Pty Ltd, Canberra, Australia.

The *Tropical Forest Update* is published quarterly in three languages (English, French and Spanish) by the International Tropical Timber Organization. Content does not necessarily reflect the views or policies of ITTO. Non-copyrighted articles may be reprinted without charge providing the *TFU*, author and photographer are credited as source. The editor should be sent a copy of the publication.

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Cover image **Painting the picture:** the pre-harvest marking of trees to be felled and retained is an important element of RIL. *Photo: B. Dale, courtesy Tropical Forest Foundation*

stration of sustainable forest management and good logging practice and has funded logger training in Brazil, Cameroon and elsewhere. A new ITTO-sponsored initiative aims to establish a RIL training centre in each of the three tropical regions to train loggers, supervisors and forest managers in RIL techniques; planning is under way for such facilities in Indonesia and Cameroon, and several countries in Latin America have expressed interest in the concept. ITTO is also about to launch a program of workshops to train industry workers in applying ITTO's criteria and indicators for sustainable forest management at the forest management unit level. The increase in awareness of sustainable forest management that will flow from these workshops should facilitate the uptake of RIL.

In 1996, FAO significantly advanced the concept of RIL when it produced the *FAO Model code of forest harvesting practice*. Building on this, FAO worked with the 29 member countries of the Asia-Pacific Forestry Commission (APFC) and various partner organisations, including ITTO, to develop the *Code of practice for forest harvesting in Asia-Pacific*, which was published by APFC in 1998. Attention has now shifted to implementation of the Code, developing national codes (now completed or being drafted in 14 Asia-Pacific countries), training, and generating political commitment. Recently, FAO began working with Central and West African countries to draft a regional code for that part of the world. To promote awareness and understanding of RIL and other sound harvesting practices, FAO manages RILNET, an email list server (see page 11), and publishes the *Forest harvesting bulletin* and a series of technical reports on environmentally sound forest harvesting.

While interest in RIL is high, many questions still need to be answered. One is implied in the term itself: 'reduced' impact logging. Is a 5% reduction sufficient, or 95%? According to Alf Leslie (page 32), ecosystem management demands 'almost zero' impact logging. Pragmatists say this is unhelpful and reckon that any reduction is better than the high impact logging that is still the norm in the tropics. But eventually the question of 'how much is enough' will need to be answered.

When widely applied, RIL will solve the immediate problem of excessive logging damage (whatever 'excessive' is interpreted to mean). But it won't solve the fundamental problem of sustainable forest management: the cost of keeping forest as forest when other land uses are more profitable. If timber grown in natural forests was more valuable it might pay the rent, but prices are actually declining (see pages 20–21). With plantation wood set to swamp the commodity markets, the prospect of a sharp price increase seems dim. How to pay for sustainable forest management remains a question of critical importance.

Also under debate is how to foster the large-scale uptake of RIL. A first step would be to admit that the blame does not lie solely with the logging sector. Governments have been unwilling or unable to enforce regulations that stipulate good forestry, the response of the timber trade to rising criticism has often been to don figurative earmuffs, and foresters and environmentalists have made plenty of noise but done far too little on the ground to bring about change for the better.

There is a better way, as hinted at by Graham Wilkinson on page 18. If the disparate forces at work in tropical forests can come together in partnership to create an enabling environment, progress will be much more rapid towards better logging practice.

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Collaborating editors for this RIL feature

Articles in this edition are based largely on the papers presented to the RIL conference in Kuching, February/March 2001.

The old and new of reduced impact logging

More training and less waste are critical to the wise use of tropical forests

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What's wrong with this photo? People living downstream drink the mud caused by poor logging and land use management upstream.

Photo: A. Sarre

THE TERM 'reduced impact logging' (RIL) started to appear in forestry publications in the early 1990s; before long it was being used widely in both technical articles and news releases. The concept of forest management technologies that reduce logging impacts appeared to resonate not only with foresters but also with the general public and, perhaps more importantly, with influential environmental organisations such as the Worldwide Fund for Nature and IUCN—the World Conservation Union. As a consequence, RIL gained a legitimacy that foresters alone could never have provided.

... there is a tendency to treat the logging operation in the way farmers treat the slaughterhouse—hide it away in the hope that it won't disturb the customers. As a result, harvesting operations are often left entirely to loggers, with little or no oversight by foresters ...

What then is RIL? The term has become associated with logging technologies that have been introduced into tropical forests explicitly for the purpose of reducing the environmental and social impacts associated with industrial timber harvesting. Although it varies somewhat with the local situation, RIL in tropical forests generally requires the following (in approximately chronological order):

- pre-harvest inventory and mapping of individual crop trees;
- pre-harvest planning of roads, skid trails and landings to provide access to the harvest area and to the individual trees scheduled for harvest, while minimising soil disturbance and protecting streams and waterways with appropriate crossings;
- pre-harvest vine-cutting in areas where heavy vines connect tree crowns;

- construction of roads, landings and skid trails so that they adhere to engineering and environmental design guidelines;
- the use of appropriate felling and bucking techniques including directional felling, cutting stumps low to the ground to avoid waste, and optimal crosscutting of tree stems into logs in a way that maximises the recovery of useful wood;
- the winching of logs to planned skid trails and ensuring that skidding machines remain on the trails at all times;
- where feasible, using yarding systems that protect soils and residual vegetation by suspending logs above the ground or by otherwise minimising soil disturbance; and
- conducting a post-harvest assessment in order to provide feedback to the concession holder and logging crews and to evaluate the degree to which RIL guidelines were successfully applied.

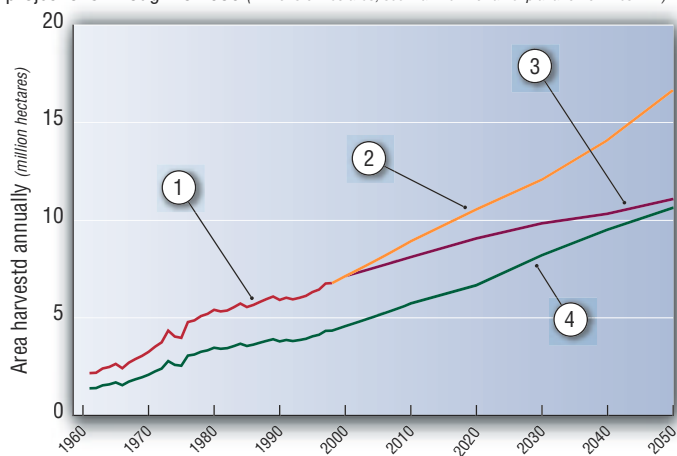
Many of these practices were developed in temperate countries, where they are widely applied (the mapping of individual crop trees and pre-harvest cutting of vines are two exceptions that are generally applicable only in tropical forests). In this sense, RIL is not new—it is simply the transfer of well-established technologies from temperate forests to the tropics. As the following discussion indicates, however, significant impediments remain to the widespread application of RIL technologies in the tropics.

Issues in reduced impact logging

Philosophical acceptance by foresters: although most foresters recognise that harvesting is necessary if income

Less waste, more forest?

Figure 1: Historical area of tropical forest harvested annually 1961–98, with projections through to 2050 (millions of hectares; see main text for an explanation of lines 1–4)



is to be generated from forestry investments, there is a tendency to treat the logging operation in the way farmers treat the slaughterhouse—hide it away in the hope that it won't disturb the customers. As a result, harvesting operations are often left entirely to loggers, with little or no oversight by foresters and no one insisting on the application of best practice.

The cost: conventional wisdom holds that environmental protection always costs more. It is generally assumed, therefore, that RIL *must* be more costly than conventional logging. The truth is just the opposite. A long series of studies, culminating in a recent study by Holmes et al. (2000), have demonstrated convincingly that properly planned and supervised harvesting operations not only meet conditions for sustainability but also reduce harvesting costs by a substantial margin compared to conventional logging. The difficulty is that these cost-savings are due to better planning, better supervisory control and more efficient use of felled timber. To obtain these savings, therefore, it is necessary to have technically competent planners, loggers and supervisors.

Training: perhaps the single most critical requirement for the successful application of RIL on a wide scale in tropical forests is the availability of skilled logging and supervisory personnel at all levels. Unless tropical countries and the development assistance agencies that work with them recognise this and strive to overcome it, there is little hope that forest concessionaires will be able to implement RIL on a large scale: they simply will be unable to find the personnel who understand both why and how to do RIL.

Aerial logging systems: most logging in tropical forests relies on ground-based skidding machines. Such systems can achieve acceptably low impacts when operators are properly trained and slopes are of low to moderate steepness. Soil impacts associated with ground skidding become unacceptably high when slopes are steeper than about 30–40% (approximately 15–20°). Aerial logging alternatives such as cable systems and helicopters can substantially reduce the direct impacts associated with ground disturbance during logging and, because of their extended yarding capabilities, can also reduce the density of haul roads needed to support logging operations. Since most soil erosion associated with logging can be traced directly to roads and skid trails, reducing the density of this infrastructure will lessen stream sedimentation and all its related offsite impacts. The primary disadvantage of aerial logging systems is that they require highly skilled crews and specialised knowledge that is often in scarce supply. This emphasises the need, again, for effective and widely available training. An additional disadvantage, for

helicopter logging at least, is that in many situations the cost is substantially higher per unit volume than for ground-based systems.

Improving harvest recovery: regardless of the logging equipment used, the amount of usable wood recovered from forest harvesting can be improved by reducing wood residues at all stages of production, from felling to skidding, to transportation and final processing. The projections given in Figure 1 show that improved utilisation, in tropical forests particularly, has tremendous potential for reducing the area of forest disturbed annually through timber harvesting. The projections assume that the demand for industrial roundwood is driven by population growth, and that a 1% increase in population results in a 0.75% increase in demand for industrial roundwood (this is based on an analysis of FAO industrial roundwood data for the period 1960–98). Under these assumptions, the United Nations' projected world population of 8.9 billion in 2050 implies a level of demand for tropical industrial roundwood in the order of 453 million m³ per year, compared to about 195 million m³ in 2000.

The historical trend (line 1) shows the rather steady increase in area harvested annually in all tropical forests between 1961 and 1998, the most recent year for which data are available. Line 2 projects this trend through 2050 on the basis of expected population growth as described above; it thus assumes no change in utilisation standards compared to the historical period. Under this level of use, 16.6 million hectares of tropical forest would need to be disturbed in the year 2050 to satisfy the projected demand for industrial roundwood.

Line 3 assumes an improvement in harvesting utilisation rates of 1% annually beginning in 2001. Even such a modest rate of improvement would result in a significant reduction in the area harvested over time. By 2050, the area of tropical forest disturbed annually in order to harvest 453 million m³ of industrial roundwood would be 11.1 million hectares, a reduction of one-third compared to the 'no change' scenario. Even more dramatically, the 1% annual improvement in utilisation would reduce the total area of tropical forest disturbed over the fifty-year period 2001–2050 by almost 150 million hectares! This is an area equivalent to more than one-tenth of the world's protected areas.

As a 'reality check', line 4 shows the area of tropical forests harvested annually between 1961 and 2050 if the tropical harvesting recovery rate were equal to the harvesting utilisation rate reported for the USA around 1990. Although far better than current practice in tropical forests, this level of use should be achievable over the long run with reasonable improvements in training and forest management. As the figure indicates, a 1% annual improvement in harvesting utilisation beginning in 2001 would result in a utilisation rate around 2050 that is very close to the 1990 USA rate.

A reduction in the annual area of tropical forest harvested in the order of magnitude suggested by this analysis would substantially benefit both timber and non-timber forest resources. In addition, the improved utilisation of felled timber would significantly reduce forest residues, thus decreasing the risk of destructive fires of the type that occurred in 1997 and 1998 in places like Brazil and Indonesia.

Reference

Holmes, T., Blate, G., Zweede, J., Pereira, R., Barreto, P., Boltz, F. and Bauch, R. 2000. *Financial costs and benefits of reduced-impact logging in the eastern Amazon*. Tropical Forest Foundation, Alexandria, Virginia.

Why RIL won't work by minimum-diameter cutting alone

RIL guidelines need to recognise that logging is the first and most important silvicultural act in tropical forests

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ACCORDING to the mean diameter cutting limit (MDCL) rule applied in the mixed dipterocarp forests of Southeast Asia, any tree with a diameter at breast height (dbh) above the specified limit of 60 cm may be felled. In the lowland dipterocarp forests, this rule leads to felling intensities as high as 10–20 trees/hectare or 100–150 m³/hectare. With such high extraction rates, reduced impact logging (RIL) is unable to significantly reduce damage to the stand. Moreover, foresters and ecologists generally agree that RIL operations based only on MDCL can neither sustain timber yields in the long term nor maintain forest ecological and functional integrity.

Here, I propose four silvicultural rules which aim to: 1) keep extraction rates below an acceptable threshold compatible with timber yield capability; 2) limit the impact of harvesting on tree species' diversity and composition; and 3) maintain timber species' populations by reducing the impact of logging on their ecology.

Rule 1

Minimum diameter cutting limit based on stand structure: three main types of population structure can be distinguished in mixed dipterocarp forest (Figure 1). For dipterocarp species, which belong to Structure I, an MDCL of 60 cm could still apply but should be modified by a rule that maintains an extraction rate threshold for all classes above 60 cm dbh based on growth model simulations.

In Structure II, the minimum diameter limit should be increased to 80 cm to leave sufficient adults to ensure reproduction and population maintenance after logging. Moreover, rare species should not be logged when the number of adult trees (ie dbh \geq 50 cm) is below five individuals within a 100-hectare compartment.

Applying the MDCL of 60 cm to species of Structure III would result in very low extraction, even if the overall tree density was similar to that in the other structure types. In these populations, trees probably reach their sexual maturity at a dbh lower than 60 cm; it might therefore be possible to decrease the minimum diameter cutting limit to about 45 cm.

Rule 2

Minimum spacing distance of 35 m between harvested trees: this rule aims to reduce both felling intensity and gap size. Experiments in East Kalimantan, Indonesia have demonstrated that logging damage can only be significantly reduced if RIL techniques are used under a moderate felling intensity of 8–9 trees/hectare. A spacing of 35 m between felled trees ($d = \frac{100}{\sqrt{x}}$, where d = distance in m and x = number of trees per hectare) would achieve this density.

Rule 3

Single-tree felling gaps: the growth of seedlings and saplings of climax dipterocarps is stimulated by canopy openings not exceeding 600 m². However, within the dipterocarp family there is a continuum from the most light-demanding species (eg *Shorea leprosula*) to understory species (eg *Vatica* spp) that grow in continuous shade. Single-tree gaps of different sizes are likely to promote and maintain post-logging species' diversity, at least within the dipterocarps.

Rule 4

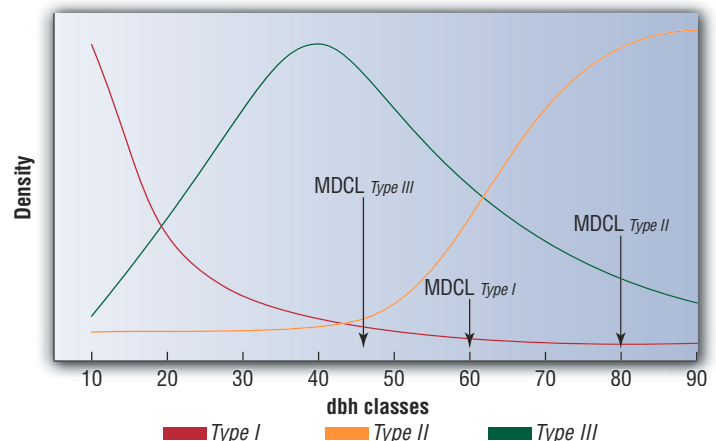
Maximum diameter cutting limit: one possible method for limiting gap size to an area that would not compromise dipterocarp regeneration is to avoid harvesting trees with dbh \geq 100 cm. In the dipterocarp forests of Southeast Asia, the density of harvestable trees with dbh 60–100 cm reaches 10–11 stems/hectare, a rather high density compared to the rainforests of Africa and South America. Limiting harvesting to commercial trees within this dbh range should not therefore be a significant production constraint.

Concluding comment

Contrary to the common understanding of RIL, reducing damage to the stand is not its objective; rather, it is only one of many requirements for maintaining the forest's productive capacity and ecological function—that is, its sustainability. Harvesting guidelines should not only tell us how to plan skid trails and implement directional felling, they should specify how many trees should be felled, which species can be harvested, which should be protected, and what will be the future timber yield. On the latter, logging is indeed the first and most important silvicultural treatment. The integration of silvicultural principles and guidelines is essential for improving RIL techniques towards sustainable harvesting practices.

Structural adjustment

Figure 1: The three main types of tree population structure in mixed dipterocarp forest (Type I = dipterocarp-dominant; Type II = eg *Agathis borneensis*, *Dyera costulata*; Type III = *Scaphium macropodum*). Arrows show the suggested minimum diameter cutting limit (MDCL) for each structure.



Implementing RIL in Indonesia

Introducing reduced impact logging requires a conducive company culture, which can be fostered by an understanding of company expectations

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Which way? Directional felling is one of the components of RIL and requires on-the-job training. Photo: A. Hinrichs

REDUCED impact logging (RIL) has been tried recently by several forest concessions in Indonesia, the results indicating that RIL can be implemented in a practical manner to increase forest harvesting performance (Klassen 2000). Successful implementation also fulfils several key indicators of the Indonesian standard for forest certification in natural forests (Agung & Hinrichs 2000).

Yet most forest concessionaires in Indonesia remain reluctant to adopt RIL, mainly because it requires well-trained staff and major changes in field operations, and because the costs and benefits are still unclear. In principle, RIL is already part of the Indonesian Selective Cutting and Planting System (TPTI) but it is not widely enforced.

Following a request by the Ministry of Forestry in 1998, the Indonesian-German Technical Cooperation Project SFMP-gtz-MoF began supporting the implementation of RIL in a private forest concession in East Kalimantan. Early

on, the company set a number of criteria for introducing RIL: operational costs should be similar to 'conventional' logging; it should employ current machinery and the existing workforce; it should increase timber utilisation and reduce accident rates, rehabilitation costs and soil disturbance; and it should cause less damage to the residual stand.

We feel that these are typical desires of private companies. In this cooperative project, we therefore tried to develop a system that would meet them to the greatest extent possible.

Implementation

The first step towards RIL implementation was an analysis of field conditions (topography, workforce and management/control system). We found that the concession area was suitable for ground-based skidding (moderate terrain, slopes < 30%), but that soils were sensitive to erosion or compaction. The workforce at all levels needed considerable training, and there had to be closer cooperation between the planning and production divisions. Moreover, it would be necessary to establish a system of operational control and revise the payment scheme to include incentives for high-quality performance.

The project redefined RIL as reduced impact *tractor* logging (Ruslim et al. 1999); the existing fleet of crawler tractors would be used for skidding but machinery movements avoided as much as possible through the use of winches. All steps in the RIL process were integrated into the TPTI system to provide continuity with current management tasks and government regulations (Figure 1). The steps were:

- a detailed topographic survey—in addition to the standard pre-harvest inventory, which includes the marking of harvestable, protected and future crop trees—is conducted two years before felling (Time of extraction [Et]-2);

Logging: the damage done

We conducted detailed measurements of forest damage in five 1-hectare plots within two 100-hectare compartments, one of which was harvested using RIL and one by 'conventional' logging. Both compartments contained lowland dipterocarp forest on slightly undulating terrain. Slopes were less than 30%. The volume felled in all plots was 65 m³/hectare (11–12 trees/hectare). The distances between plots and log decks were identical between RIL and conventional plots.

For all plots, logs were extracted using Komatsu D85E-SS crawler tractors operated by experienced operators. In the RIL plots, logs were winched for up to 30 m with the assistance of two tractor helpers. The following results were achieved:

- **soil disturbance:** opening up caused by skidding decreased by 66% with RIL, while overall opening up decreased by 29%;
- **residual stand quality:** residual stand damage caused by skidding decreased by 56% with RIL, while overall residual stand damage decreased by 28%;
- **logging waste:** waste was reduced by 20% under RIL; and
- **productivity:** RIL caused a slight drop in skidding productivity (due to longer winching distances).

Source: Ruslim et al. (2000)

- based on the topographic and tree location data, a GIS-generated map showing tree locations and topographic information is developed one year before harvesting (Et-1). The optimal skid trail locations are planned on this map following ten agreed principles;
- three months before felling (Et-0.3), skid trails are marked in the forest and opened up;
- the felling team is advised to conduct directional felling wherever possible and to reduce waste. Safety measures are required (escape route, flexibility in felling direction, personal safety equipment);
- skidding is restricted to skid trails, with a winching corridor of 30 m on both sides. 'Blading'—the use of tractor blades to clear a path through the vegetation—is avoided wherever possible and no skidding takes place when it is raining; and
- the foremen of the production division perform supervisory and routine control. After skidding, the tractor operator 'closes' the skid trails and log decks to minimise erosion. Joint teams from the planning and operational divisions conduct post-harvest assessment; work quality is assessed for the calculation of premium wages based on a detailed set of agreed criteria.

In-house training courses were held for staff of the planning division and the logging crews (foremen, operators), while division heads attended outside training courses on the theory and practice of RIL.

Winning the company over

RIL, as defined in the steps above, significantly reduces forest damage at a reasonable cost at this East Kalimantan forest concession (*see box*). Due to lower skidding productivity and the additional planning steps, RIL was US\$1/m³ more expensive than conventional logging. But under RIL an additional 2 m³/hectare was extracted through waste reduction measures and rehabilitation costs were cut to almost zero; the time before the next cut could therefore be reduced. Based on the study results, the company started to implement RIL on an operational scale last year.

Lessons learned

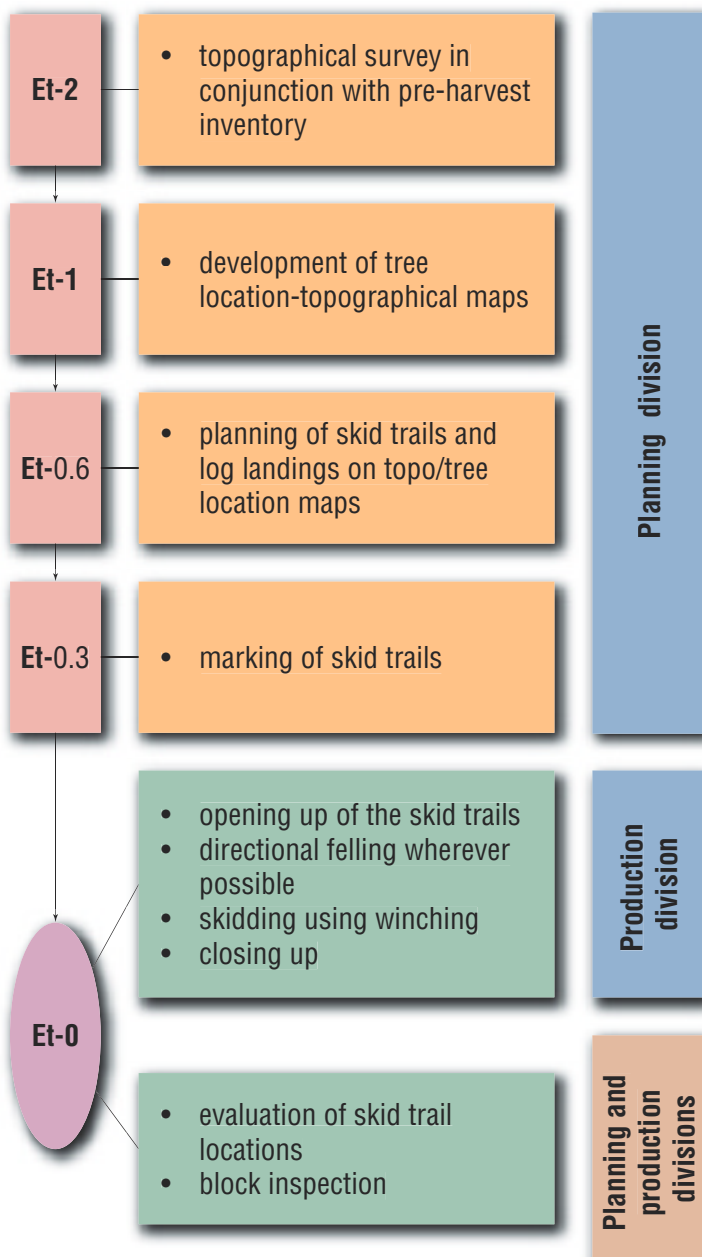
RIL can be implemented in a private forest concession if:

- increased knowledge about the benefits of RIL leads to a strong commitment for implementation by top management;
- company management is willing to invest in human resources and, if required, superior technologies;
- intensive and reliable internal control systems are in place or can be put in place;
- forest operators—planners, foresters and machine operators—have the freedom to apply a 'learning by doing' approach and the company fosters a culture of openness to criticism; and
- the company is given time—about two years—to adjust planning and production measures.

We strongly urge the Indonesian authorities to establish a legal framework in support of RIL and sustainable forest management. Only transparent and stable framework conditions will encourage investments in environmentally sound harvesting techniques by the private sector and forest communities. The forest concessionaires themselves should understand that RIL is nothing more or less than a prerequisite of sustainable forest management, which in turn is a prerequisite for any company wishing to engage in forestry over the long term.

When to do what

Figure 1: The chronology of reduced impact logging in the study area



References

Agung, F. and Hinrichs, A. 2000. *Self-scoping handbook for sustainable forest management certification in Indonesia*. SFMP Document No 6a/2000.

Klassen, A. 2000. Analisis aspek finansial dan produktivitas reduced impact logging (RIL). Hutan Indonesia. *Bulletin APHI*. 9th edition, 8/2000.

Ruslim, Y., Hinrichs, A. and Sulistioadi, B. 2000. *Study on implementation of reduced impact tractor logging*. SFMP Documents No. 01a/2000.

Ruslim, Y., Hinrichs, A., Ulbricht, R. and PT Limbang Ganeca 1999. *Technical guideline for reduced impact tractor logging*. SFMP Documents No 10a/1999.

Changing harvesting practice in the Amazon

What facilitates and what impedes the adoption of reduced impact logging in the Brazilian and Bolivian Amazon?

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Measuring up: knowing what's in the forest—and where it is—is an essential element of RIL. *Photo courtesy the Tropical Forest Foundation*

BOLIVIA and Brazil have made progress towards implementing reduced impact logging (RIL) in their Amazonian forests in recent years, but such practices are still far from universal in either country. Recently we interviewed eleven people in Brazil (including owners and foresters from seven companies) and 13 in Bolivia (including foresters from four companies). Our aim was to address three questions:

- which producers in Bolivia and Brazil are adopting RIL?
- what specific RIL elements are being adopted?
- what factors are motivating or impeding adoption?

Although several forest communities in both countries have also made substantial progress toward RIL adoption, we focused our efforts on the corporate sector because it represented the largest proportion of forestry activities.

The four Bolivian companies interviewed hold concessions located in the three principal forest types (dry, transitional and wet). Three of these companies, CIMAL/RODA, La Chonta and San Martin, hold 80% (about 650 000 hectares) of the total area of forests certified as well-managed in Bolivia. The fourth, Oquiriquia, is not certified.

The area represented by the seven Brazilian companies is about 800 000 hectares. At present, only Gethal, Mil Madeiras

and Jurua are certified, although CIKEL and Rosa Madeiras recently went through the certification process. Jarcel and Amacol are not certified. Five of these companies are in the eastern Amazon and two are near Manaus.

Forest ownership and market access

Approximately 80% of Bolivia's production forest (by area) is state-owned and the government uses a concession system to grant timber-harvesting rights (40-year renewable contracts) to private companies. In contrast, about 90% of Brazil's timber is derived from privately owned forests. Although the government regulates forestry activities in both countries, confidence in resource tenure security as well as motivation for resource stewardship probably differ between the two kinds of land ownership.

Market access also affects the forest sectors of Bolivia and Brazil differently. Although Bolivia relies on foreign markets (particularly in Europe and the USA) proportionally more than Brazil, accessing these markets is costly because companies must transport wood across either the Andes or the Amazon Basin. This limitation reduces the number of species (and hence volumes) that can be harvested profitably. Similar difficulties exist for companies located in the western and southern Brazilian Amazon: they harvest fewer species and lower volumes than those operating in the eastern Amazon, where roads are better and transport distances shorter.

RIL progress: general trends

In 1996 the Bolivian government enacted a forestry law that mandates sustainable forest management. The technical guidelines for this law are equivalent to RIL prescriptions. The law also created a new, more transparent forest service (Superintendencia Forestal – SF) responsible for law enforcement. According to the SF and other sources, about one-third of the 45 firms operating concessions are making substantial progress towards RIL implementation.

In Brazil, the forest service (IBAMA) has incorporated RIL guidelines into its technical norms for forest management

Motivating good logging

Table 1: The importance of factors motivating the adoption of RIL in Bolivia and Brazil (on a scale of 0–4, 0 = not important, 4 = most important)

Factor	Bolivia	Brazil
Law/enforcement	3	2
Efficiency/cost savings	3	4
Public (NGO) pressure	1	1
Certification/markets	4	2
Technical assistance	3	4
Image/good for forest/safety	2	2

in upland forests. IBAMA rangers audit forest management using RIL prescriptions as their evaluation standard. One indicator of uptake, the demand for RIL training, has increased dramatically in the region in the past five years.

Which producers are using RIL?

The companies making most progress towards RIL implementation are large, well organised and vertically integrated. They also have a diverse product base and own substantial forest areas (Brazil) or have multiple concessions (Bolivia). In Bolivia, most progress has been made by companies that began the transition to improved forest management before enactment of the 1996 law. Such companies realised they would improve their access to international markets if they obtained Forest Stewardship Council (FSC) certificates. To their advantage, the gap between complying with the law (ie adopting RIL) and becoming FSC-certified is small (Jack 1999). As a result, Bolivia leads the tropical world in area of natural forest certified (Nittler & Nash 1999).

In Brazil, the companies making most progress towards RIL adoption are those with enough capital to invest in appropriate technology and training of personnel and with moderately low levels of perceived risk from wildfire or squatters. Although far fewer companies (and hectares) are FSC-certified in Brazil than in Bolivia, these numbers are growing. Given Brazil's strong internal markets that do not yet demand certified wood, the movement toward certification may reflect a growing interest among producers in export markets and long-term forest management.

What RIL elements are being adopted?

Knowing the elements of RIL most commonly adopted may help refine training efforts and also reveal those elements that producers believe are most immediately beneficial. In general, companies in Bolivia and Brazil have most readily adopted the RIL elements that increase efficiency, reduce costs, enable them to comply with the law, and help them improve marketing. Mostly, these include planning (eg harvest maps, annual operating plans, and road planning). Still lacking is full implementation of those RIL elements especially beneficial for the forest, including directional felling and skid trail layout to protect future crop trees, minimal impact skidding, and watercourse protection. Producers must also improve the supervision of felling and skidding crews. Finally, although many producers appear to be valuing the resource more than in the past (eg by leaving low stumps), most can still considerably improve wood utilisation efficiency.

Motivating factors for RIL adoption

Many factors influence the degree to which companies are adopting specific RIL elements and these factors vary between the two countries (Table 1). In Bolivia, improving market access through certification is probably the most important reason for RIL adoption. The 1996 forestry law and its enforcement by the SF have undoubtedly accelerated the pace at which companies are moving toward certification in Bolivia. In Brazil, the most important factor driving RIL is increased operational efficiency and consequent cost savings. It is noteworthy that most companies implementing RIL only became convinced of its benefits after receiving technical assistance and, in some cases, the subsidised training of workers.

Impeding factors to RIL adoption

Given the size and complexity of the region, generalisations about the factors impeding RIL uptake in the Amazon Basin must be viewed with

caution. Nevertheless, several important obstacles are apparent in both Brazil and Bolivia (Table 2). First, the perception that RIL is prohibitively expensive is still common among forest (or company) owners and senior managers. Second, RIL adoption is especially limited where risks from fire and squatters and insecure land tenure prevail. Large transport distances, weak processing capacity, poor organisation and management, and limited stocks of commercial species also seem to be important disincentives. Finally, the lack of trained people at all levels (practitioners to managers) is an important constraint to RIL adoption throughout the region.

Getting in the way

Table 2: The importance of factors impeding the adoption of RIL in Bolivia and Brazil (on a scale of 0–4 where 0 = not important and 4 = most important)

Factor	Bolivia	Brazil
Think RIL too costly	4	4
Lack of understanding	3	3
Forest management not main interest	2	4
General disincentives	3	3
Insecure land tenure	4	3
Risk of fire, squatters, etc	4	3
Lack of trained people	4	4
Lack of proper equipment	1	2
Low volume of valuable species	3	1
Poor market access	4	2
Credit unavailable	3	3
Cheap wood available	1	2

Recommendations

A number of actions may help accelerate the adoption of RIL in Bolivia and Brazil. First, we need to use appropriate media to explain the benefits of RIL to relevant target audiences. The fact that numerous companies across the Amazon have begun adopting RIL suggests a willingness to move towards better forest management. Second, we need to develop and test cost-effective options for the range of producers operating under different conditions across the Amazon. Third, a detailed elaboration of the disincentives to sustainable forest management may help clarify the risks to producers. Better targeted policies may not remove all these risks, but they could create a more enabling environment. Fourth, we need to strengthen third-party certification and other market-based incentives for good forest management.

References

- Jack, D. 1999. *La certificación y el manejo forestal sostenible en Bolivia*. Documento Técnico 79/1999, BOLFOR, Santa Cruz, Bolivia.
- Nittler, J. and Nash, D. 1999. The certification model for forestry in Bolivia. *Journal of forestry* 97: 32–36.
- SF (Superintendencia Forestal) 2000. *Informe anual de la Superintendencia Forestal*. Santa Cruz, Bolivia. Superintendencia Forestal.

Changing attitude in the forest

A pilot project to implement RIL in Indonesia has created enthusiasm for the practice amongst concessionaires

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Contrast: under conventional practice (left), snig trails are needlessly wide, often restricting water drainage and causing undue damage to the soil. Under RIL (right), snig trails are narrower and cause less soil disturbance.



THE Bulungan Research Forest (BRF) comprises 321 000 hectares of forest in the Malinau District of East Kalimantan. Together with the adjacent Kayan Mentarang National Park it constitutes an expanse of more than 1.7 million hectares of primary forest in the heart of one of Asia's largest remaining tracts of biodiverse tropical rainforest.

Although much of the BRF is protected, some of it is currently being logged or will be logged. The standard practice of timber concessionaires is to employ the Indonesian Selective Logging and Planting System (TPTI), a logging regime designed by the Indonesian government that has been in use for some decades. Such concessionaires are concerned that RIL will increase logging costs because of the need for better planning and supervision. Therefore, the Indonesian Government requested experiments to test the feasibility of applying the RIL approach in Indonesia.

PT Inhutani II, a state-owned logging company, collaborated with the Center for International Forestry Research (CIFOR) in an ITTO-funded project (PD 12/97 REV.1(F)) to test the RIL approach in its operations in the BRF near the town of Malinau. The work is also being supported by the John D and Catherine T MacArthur Foundation, CIRAD-Forêt, the USDA Forest Service and PT Trakindo Utama, a private enterprise.

The project has several main components: development of appropriate logging guidelines for the Malinau forest; training of PT Inhutani II staff in the various aspects and techniques required for the successful implementation of the guidelines, especially in inventory, tree felling and planning; assessment of the costs and benefits of RIL versus conventional logging; and co-management of the transition to self-implementation of RIL by the concessionaire. This article reports some of the results, problems and outcomes of the initial phase of the project.

RIL guidelines

Central to the successful implementation of RIL is a clear set of guidelines that define the actions necessary to achieve it. The guidelines adopted by the project conform with TPTI regulations and are based on the ITTO *Guidelines for the sustainable management of natural tropical forests* (ITTO 1990) and the FAO *Model code of forest harvesting practice* (Dykstra & Heinrich 1996). The purpose of the guidelines was to set up the rules for RIL implementation in the Malinau concession; they concentrate on reducing the impacts of tree-felling and heavy machinery on the remaining stand and forest soil. The main elements (see Sist et al. 1998 for a full description) are:

- stock survey and mapping (1:2 000 scale) of trees to be harvested and potential future crop trees above 20 cm dbh;
- topographic assessment and mapping (1:2 000 scale);
- designation and mapping of protected areas (eg streamside buffer zones, important wildlife habitats, sacred areas) and unworkable areas (too steep, rocky and/or possessing very low volumes of commercial timber);
- cutting all climbers (dbh > 2 cm) around each tree to be felled at least nine months before logging;
- planning and marking roads and skid trails, which are preferentially located on ridge-tops;
- reduction in the size and number of log landings; and
- protection of topsoil and water courses by reducing use of bulldozer blades, introduction of cross-drains on skid trails, establishment of stream buffer zones, and halting forest operations during rainy periods.

The guidelines include detailed specifications for road construction, stream crossings, wet weather shut-down, skid trail width, log-landing size and location, and post-logging closure of roads and skid trails. They were developed into a

manual that can be easily understood by operators; most important of all, their implementation was closely supervised in the field at all times.

Training and implementation

The project included a strong training component aimed particularly at tree-fellers, tractor operators and forest planners. Chainsaw operators were trained in tree marking and directional felling techniques. Tractor operators were instructed on techniques to reduce damage while skidding by avoiding excessive blading and maximising use of the winch. Forest planners were trained on stock survey and topographic assessments as well as planning the skidding network using user-friendly computer software. Although these training courses were primarily for Inhutani II staff, other logging companies in the area and the research and training agencies of the Indonesian Ministry of Forestry also participated.

Assessing the differences

Logging efficiency and operational costs

RIL and conventional techniques were tested in three blocks of about 100 hectares each. Logging damage was assessed on the basis of pre- and post-harvesting stand inventories in 24 sample plots of one hectare each. The assessment showed that the area of skid trail per volume of timber extracted was twice as high in the conventionally logged blocks than in the RIL blocks (18.6 m²/m³ vs 8.6 m²/m³). Damage to the stand and canopy increased with felling intensity in the RIL blocks but not in the conventionally logged blocks. Under high felling intensity (> 9 trees/hectare), the proportions of damaged and dead trees in RIL were similar to those recorded in conventionally logged sites. This study confirmed the conclusions of other studies in tropical forests (eg Sist et al. 1998; see also Sist in this issue) that RIL cannot significantly reduce damage to the residual trees under high felling intensities. In mixed dipterocarp forest, where harvestable timber density generally exceeds 10 trees/hectare, specific rules to limit felling intensity are urgently needed.

Costs

Preliminary results from an economic cost assessment show that the productivity of felling and skidding in RIL increased by 28% and 25% respectively compared to that achieved using conventional techniques. Overall, RIL reduced costs in these two components by Rp3 235/m³ (or about US\$0.3/m³). The main changes in the operational costs of conventional logging and RIL occurred in skidding and pre-harvesting. The direct financial benefit gained through waste reduction or higher recovery was estimated at Rp20 000/m³ (about US\$2/m³) of commercial volume. Hence, RIL increased revenue by Rp23 235/m³. However, the total net cost or benefit of RIL, including the costs of training and planning, remains to be calculated.

Impacts of project activities

One of the most pleasing consequences of the project has been the development of a sense of pride among the logging crews and field staff in applying RIL. The training of a few logging crews has catalysed changes in attitude towards logging in neighbouring concessions. For example, two concessionaires in nearby forests joined the first RIL training course and still more joined the second. Moreover, an increase in professional pride and a sense of competitiveness has led to an unexpected improvement in the performance of logging crews operating elsewhere in the Inhutani II concession.

Another positive effect has been the increased awareness of the benefits of RIL. The wider public has become better informed about the benefits of logging to a higher standard, while the BRF has attracted hundreds of loggers and forestry professionals to view good logging practice in action.

It is crucial to differentiate between the cost of *introducing* RIL and its *ongoing* cost. The 'up-front' costs involved in initial training and changes to the management regime and operational procedures can be considerable, but they will bring lasting returns in increased productivity and efficiency and reduced time before the next viable harvest. Assistance from international development agencies in the start-up phase of RIL can therefore have a long-term impact on forest practices and attitudes.

Critical to the success of the project is the extent of adoption by the company once the project finishes. Undoubtedly Inhutani II managers now have a more positive attitude towards RIL. Our work clearly showed that production and productivity were significantly increased under RIL; RIL is therefore no longer regarded as the experimental tool of scientists but as a way of increasing logging efficiency. The best demonstration of this change in attitude was the decision taken by Inhutani II to harvest two 100-hectare blocks in 2000 and three more blocks in 2001 using RIL.

The first phase of this RIL project has created a positive momentum towards better logging practices. It has demonstrated that the technical impediments can be overcome without major difficulty. Presenting locally adapted guidelines in a format that operators understand is critical for effective uptake.

References

- Dykstra, D. and Heinrich, R. 1996. *FAO Model code of forest harvesting practice*. FAO, Rome.
- ITTO 1990. *ITTO Guidelines for the sustainable management of natural tropical forests*. ITTO, Yokohama.
- Sist, P., Dykstra, D. and Fimbel, R. 1998. Reduced impact logging guidelines for lowland and hill dipterocarp forest in Indonesia. *Bulungan research report series no. 1*. CIFOR Occasional Paper No. 15. Bogor.
- Sist, P., Nolan, T., Bertault, J.-G. and Dykstra, D. 1998. Harvesting intensity versus sustainability in Indonesia. *Forest ecology and management* 108: 251–260.

RILNET: Fifty sent and more to come!

RILNET is an email listserver dedicated to the distribution of information on reduced impact logging (RIL). In June this year, RILNET sent out its 50th message to a subscriber list that has grown from 150 at its inception in October 1999 to more than 550 today.

RILNET forms part of the Asia-Pacific Forestry Commission's efforts to raise awareness for its Code of practice for forest harvesting in Asia-Pacific. It is supported by the USDA Forest Service and FAO.

What exactly does RILNET do? It keeps its subscribers up to date on RIL-related issues. It mails out brief messages and indicates how additional information on a particular topic can be obtained. Currently it is only distributed in English.

RILNET is all about sharing information and experiences and its success depends on the enthusiasm of its subscribers. If you have experiences to share or would just like to tap into a valuable information resource contact: RILNET c/o Tan and Associates; tlc@loxinfo.co.th

Does it cost or does it pay?

An investigation of the costs and benefits of reduced impact logging

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THERE has been increasing interest in reduced impact logging (RIL) in the last decade. Given the political and market demand for the change, we need to further articulate the nature of RIL and address some important questions. For example, what have the harvesting studies carried out to date told us about the cost-effectiveness of RIL? Perhaps more importantly, what have they not told us? Does RIL cost or does it pay?

In order to answer this key question, we analysed 266 publications dealing with RIL. We aimed to:

- define and characterise RIL;
- review existing literature to extract the quantitative information on RIL;
- develop a prototype model for recording data of RIL and conventional logging operations; and
- compile a general cost profile of different logging machines.

Defining and characterising RIL

Based on the work of various authors (Armstrong & Inglis 2000; Elias 1999; van der Hout 1999; Reid & Rice 1997; Ruslim et al. 1999; Sist et al. 1998; Sist 2000; Vanuatu Department of Forests 1999; Webb 1997), the following definition of RIL was chosen:

RIL is the intensively planned and carefully controlled implementation of harvesting operations to minimise the impact on forest stands and soils, usually in individual tree selection cutting.

Under RIL, stands should be harvested only on a predetermined cutting cycle, which generally should be no shorter than 20 years. No more than one-third of stand basal area should be removed at any one entry and a pre-harvest operational inventory should be conducted. Access road construction should be done well in advance of harvesting and climbers should be cut, if required, two years before harvest. Tree-marking, location mapping and determination of preferred felling directions should be linked to the layout of an optimum number of extraction (skid) trails. Once the logs are removed,

Quantifying the difference

Table 1: Median values for various parameters in conventional (CL) and RIL obtained from examples in the scientific literature.

Parameter	Total no of observations (CL/RIL) ¹	Unit	CL	RIL	Differences in %
Logging intensity	130 (93/37)	m ³ /hectare	45	37	-18
Logging intensity	101 (56/45)	trees/hectare	8	8	0
Logging cycle		years	35	34	0
Costs—planning	10 (2/8)	\$US/m ³	1.44	1.72	+19
Costs—felling	10 (3/7)	\$US/m ³	0.60	1.16	+93
Costs—skidding	11 (5/6)	\$US/m ³	4.64	4.46	-4
Costs—total ²	23 (10/13)	\$US/m ³	19.73	28.23	+43
Damage—residual stand	75 (42/33)	% of residuals	49	29	-41
Damage—stand	15 (8/7)	trees/trees felled	22	9	-59
Damage—site	58 (39/19)	% of area	18	8	-56
Canopy opening	25 (14/11)	% of area	25	16	-36
Lost timber	33 (25/8)	% of removal	25	15	-40
Utilisation rate	35 (17/4)	% of felled timber	47	60	+28

¹The number of data sets obtained from the literature; numbers in brackets refer to the number of observations of CL and RIL, respectively.
²Total cost data were obtained from different studies than were the detailed costs data, therefore the results differ.

they should be placed on landings of minimal size. Logging operations should only be conducted under favourable conditions (eg when soils are dry). Forest workers and supervisors should be well trained and capable of conducting post-harvest assessments.

Results

The information given in the various studies was analysed using parameters that corresponded to the characteristics described in the box. Table 1 presents median values for observed results.

Discussion

Since there is no standard protocol for assessing the impacts of logging, the challenge is to compare data from a wide and disparate range of studies. Although the findings presented here can only be considered indicative of general trends, a number of conclusions can be drawn:

- RIL is more expensive than conventional logging if only the operational costs are considered and a short-term perspective is taken;
- RIL has considerably less impact on the residual stand and site and creates smaller canopy openings. This enhances regeneration and, in some cases, allows an earlier re-entry with a higher second cut; and
- RIL considerably increases the recovery of timber felled and reduces the percentage of lost logs, increasing productivity and income for the logging operator.

Considering the long-term economic implications of site and stand damage, and increased timber recovery, it is argued that in many cases RIL is economically competitive with conventional logging.

A standard protocol for assessing the impacts of RIL and conventional logging should be further developed. A prototype statistical framework, which is being designed as a web-based statistical tool, can be obtained by contacting the authors of this article. With a solid statistical base, more

The main characteristics of RIL

- Stand entries at pre-determined cutting cycle
- Landings planned
- Harvest planning includes tree-marking, location mapping and determination of felling direction
- Less than 1/3 of stand basal area removed
- Pre-harvest operational inventory conducted
- Climber-cutting if required
- Skid trail length minimised
- Advanced access road construction
- Operations only allowed under favourable conditions
- Maximum utilisation of all trees felled
- Minimal residual damage
- Rehabilitation conducted to 'fix' negative impacts
- Worker and supervisor training conducted
- Post-harvest assessment carried out

Improving occupational safety and health in forestry is a precondition for reduced impact logging

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LIFE is often hard and dangerous for the tens of millions of people who work in forests or depend on them for a living. High accident rates and poor working conditions are not only detrimental to the workforce, they constitute a major impediment to the implementation of reduced impact logging (RIL).

Forestry: profession of last resort?

Most forestry work is still characterised by a difficult working environment, heavy physical effort and a high risk of accident. In developing countries in particular, this often results in a vicious circle of low productivity, poor wages and an unstable workforce. Forestry becomes employment of last resort for people with no other alternatives—obviously not the best basis for recruitment. High labour turnover also provides a poor base for skill development, which in turn is a precondition for the effective implementation of RIL.

Increasingly, performance-based forest management and certification standards, such as those developed by ITTO and the Forest Stewardship Council, include explicit social and labour requirements. Failing to meet these jeopardises the chances of obtaining certification and therefore access to some markets. It may also limit opportunities for other incentives schemes such as carbon offsets.

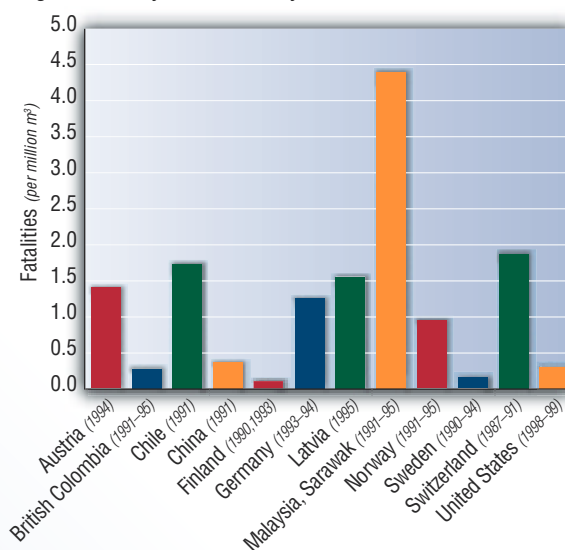
This picture might seem gloomy and exaggerated, but the current safety and health situation in many countries gives reason for worry.

The dangers of logging

Forestry continues to be one of the most hazardous occupations in the world. In the United States, for example,

Deadly work

Figure 1: Fatality rates in forestry work for selected countries



forestry had the highest fatality rate (160 per 100 000 people employed) of any industry in 1998/99. Nevertheless, Figure 1 shows that the US rate is much lower than in many other countries. The data are mostly from the mid-nineties, but more recent information obtained from individual companies in Indonesia (1997) and Malaysia (2000) suggests that the situation in the tropics has remained the same or, in some cases, deteriorated. Some large logging companies are known to have fatality rates of up to 14 deaths per million m³ of harvested timber.

Often eclipsed by the more visible accidents are the serious health problems associated with forestry, particularly those

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elaborate harvesting models can be built to include critical variables such as the cost of lost logs, timber utilisation, stand and site damage, and canopy opening size.

The annotated bibliography compiled by the research reported in this article can be found at <http://www.fao.org/forestry/FOP/FOPH/harvest/x0001e/X0001E00.htm>

References

Armstrong, S. and Inglis, C. 2000. RIL for real: introducing reduced impact logging techniques into a commercial forestry operation in Guyana. *International forestry review* 2(1): 17-23.

Elias 1999. Introducing a manual on reduced impact timber harvesting in the Indonesian selective cutting and planting system. *ITTO Tropical forest update* 9(3): 26-30.

Pulkki, R. 1997. *Literature synthesis on logging impacts in moist tropical forests*. Working Paper No. 6, Forest Products Division. FAO, Rome.

Pulkki, R., Schwab, O. and Bull, G. 2001. *Reduced impact logging in tropical forests: literature synthesis, analysis and prototype statistical framework*. Working Paper No. 8, Forest Products Division. FAO, Rome.

Reid, J. and Rice, R. 1997. Assessing natural forest management as a tool for tropical forest conservation. *Ambio* 26(6): 382-386.

Ruslim, Y., Hinrichs, A. and Ulbricht, R. 1999. *Technical guideline for reduced impact tractor logging*. SFMP Document No. 10a. Indonesian-German Technical Cooperation. Ministry of Forestry and Estate Crops in cooperation with Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ).

Schwab, O., Pulkki, R. and Bull, G. 2001. *Literature review on logging impacts in moist tropical forests*. Working Paper No. 7, Forest Products Division. FAO, Rome.

Sist, P. 2000. Reduced impact logging in the tropics: objectives, principles and impacts. *International forestry review* 2(1): 3-10.

Sist, P., Dykstra, D. and Fimbel, R. 1998. *Reduced impact logging guidelines for lowland and hill dipterocarp forests in Indonesia*. CIFOR Occasional Paper No. 15. Centre for International Forestry Research, Jakarta.

Van der Hout, P. 1999. *Reduced impact logging in the tropical rain forest of Guyana*. PhD dissertation. University Utrecht.

Vanuatu Department of Forests 1999. *Vanuatu reduced impact logging guidelines*. Vanuatu Department of Forests, Port Vila.

Webb, E.L. 1997. Canopy removal and residual stand damage during controlled selective logging in lowland swamp forest of northeast Costa Rica. *Forest ecology and management* 95: 117-129.

Competency-based training and education in Vanuatu have helped improve forest harvesting practices

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PEOPLE differ in their responses and commitment to new standards or technologies and in their ability to put them into practice. Critical to any strategy for improving forest harvesting practices, then, is a structured and systematic approach to the training and education of industry personnel at all levels.

Traditionally, training in forest practices has focused on the inputs, contents and 'time spent' at training courses rather than on the tasks that participants could accomplish after attending such courses. Competency-based training, on the other hand, is a modern training procedure that recognises prior learning and practical experience. It:

- provides objective, pre-determined assessment criteria and clearly specified training outcomes;
- emphasises the essential skills, knowledge and attitudes required to successfully complete a specified task;

- requires trainees to demonstrate competence by completing a task to the required standard. Operator competence is defined as possessing the necessary skills, knowledge and attitude to complete a nominated task satisfactorily using predetermined assessment criteria (usually based on industry standards); and
- provides formal recognition of competence ('competency-based assessment') either internally within an organisation or externally via an industry accreditation scheme.

A systematic approach to competency-based training involves the following steps:

- a detailed 'training needs analysis' (either at the organisational, vocational or individual level);
- a definition of detailed assessment criteria for each task;

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Looking after workers ► continued from page 13

related to excessive physical workloads, noise and vibration. These can induce life-long impairments and serious illness and are a major reason for employees leaving their jobs prematurely.

Safety and health make economic sense

Accidents cost money, often much more than meets the eye. Paradoxically, safety has tended to be neglected as a result of economic difficulties. In view of the cost of inaction, such difficulties should really have had the opposite effect and been a major stimulus for tackling safety issues. One reason why this has not happened might be that management often does not know the real cost of accidents. Many of the indirect costs are not obvious or easy to assess: a case-study from Malaysia (Manikam 1985) provides data suggesting that the indirect costs of poor work safety can be up to six times higher than the direct cost.

Codes of practice—the way ahead

The recent development of standards and codes of practice that integrate safety and health aspects with environmental and productivity requirements promises a way out of the safety and health spiral. While setting minimum standards for qualification and working conditions, such codes also improve efficiency in forest operations, which in turn provides a basis for better terms of employment. The more positive image of the profession further helps to stabilise the workforce.

Codes have had a positive impact in the field. For example, independent evaluations of the Fiji *National code of logging practice* adopted in 1990 with assistance from the International Labour Organisation (ILO) concluded that the Code had had a clear, positive impact on the environment, working conditions and productivity.

ILO recently published the *Code of practice on safety and health in forestry work* (ILO 1998). This aims to protect workers from hazards in forestry work and to prevent or reduce the incidence of illness or injury. It emphasises that safety policies must be pursued at all levels—nationally, in the enterprise

and at the worksite. ILO is promoting its Code and assisting member countries and industry to adapt it to national conditions, by, for example, incorporating it in broader codes of forest practice. It recommends that the Code be used systematically as a reference in the design and implementation of RIL operations.

Occupational safety and health criteria

Occupational safety and health criteria should be part of the criteria of sustainable forest management (see Poschen 2000). For example, forest management could not be considered sustainable unless:

- a safety and health policy and management system is in place to systematically identify hazards and preventive measures and ensure that these are implemented in the operation;
- all necessary tools, machines and substances are available at the worksite and are in a safe and serviceable condition;
- safety and health requirements are taken into account in all stages of forest work—from planning to execution; and
- where workers stay in camps, conditions for accommodation and nutrition comply at least with the ILO *Code of practice on safety and health in forestry work*.

References

ILO 1998. *Safety and health in forestry work. An ILO code of practice*. International Labour Office, Geneva.

Manikam, D. 1985. *Accidents and safety in logging companies in Sarawak*. Occasional Paper No.3. Universiti Pertanian Malaysia, Serdang.

Poschen, P. 2000. *Social criteria and indicators for sustainable forest management. A guide to ILO texts*. International Labour Office, Geneva.

ILO operates a network on the forestry workforce. Information on this and other forestry activities is available at <http://www.ilo.org/public/english/dialogue/sector/sectors/forest.htm>

- recruitment and training of instructors and assessors;
- development and delivery of training programs based on the identified training needs and assessment criteria; and
- formal assessment of operator competence and, if required, accreditation.

The Vanuatu code

Vanuatu introduced its *Code of logging practice* (hereinafter referred to as 'the Code') in 1998. Complementary to the Code was a set of reduced impact logging (RIL) guidelines designed to assist field supervisory staff and industry operators to execute a forest harvesting plan (Vanuatu Department of Forests 1999). These guidelines are enforceable by law and specify tree selection and skid trail alignment procedures, maximum skid trail and landing dimensions, and log extraction techniques.

Vanuatu's forest industry is small in international terms but nationally is an important sector. Numerous recent initiatives aimed at improving forest management include:

- a 1994 moratorium on log exports and the development of a downstream processing policy;
- the endorsement in 1998 of a national forest policy;
- revision of forestry-related legislation; and
- the development of flexible silvicultural prescriptions.

Training activities

Harvesting planner and supervisor training programs

The Code requires that all harvesting operations have an approved harvesting plan and are executed in accordance with that plan. Nominated industry supervisors are responsible for plan preparation and operational supervision.

To ensure that the supervisory group had sufficient skills and knowledge to prepare harvesting plans and supervise operations, a series of modular training programs were designed and delivered by staff of the Department of Forests and members of the AUSAID-sponsored *Vanuatu sustainable forest utilisation project* (Andrewartha et al. 2000). Course contents included operational forest planning, data collection, the supervision of harvesting operations, and monitoring procedures. Trainees were required to conduct forest inventories and prepare operational and strategic harvesting plans based on the requirements of the Code.

Operator training programs

Operators are those forest workers involved primarily in road construction and maintenance, tree felling, log extraction and processing. This industry group is characterised by low levels of both skill and literacy.

A modular, progressive approach to training was adopted whereby operators participated in short, formal training programs over a period of months. The training emphasis was on the requirements and practical application of the Code and RIL guidelines; the program provided training on such aspects as directional felling, low-impact skid trail construction, and the conservation of streamside reserves.

Detailed training manuals were developed to assist in providing efficient and effective training and were based on the key components of the Code. The manuals contained session objectives, session notes and supporting visual or training aids. Twenty-one training modules were developed:

these were either compulsory for all harvesting personnel (eg water and soil protection) or vocationally specific (eg restoration requirements) for designated machinery operators. Most courses were structured around the introduction of theoretical principles followed by their practical application in the forest.

Training was delivered and assessed by a dedicated training and assessment team comprising industry and departmental staff using an agreed curriculum. This team participated in trainer-training programs and was involved in the design of the Code implementation strategy.

The industry program, delivered over a six-month period in 1999, was constantly reviewed and refined by the training team, resulting in numerous improvements in course content, structure and methods of delivery.

Accreditation of operators

An operator accreditation scheme was introduced to coincide with the introduction of the Code and RIL guidelines. The scheme is managed by the Department of Forests and involves assessing basic operator competence, including technical skills and knowledge of and compliance with the Code. All major forest industry organisations are required to have accredited operators.

Conclusions

To improve forest harvesting practices, a skilled and trained workforce is essential. Developing such a workforce requires money, resources and support from all levels of management, dedication by forest supervisors, enthusiasm from trainers and, above all, application of the required standards by all forest operators.

All these aspects are intrinsically linked, vary in the support given to them, and can be difficult to measure objectively. However, some key steps are essential for real progress in establishing a competent workforce. These include:

- developing competency-based training and assessment programs;
- developing industry operating standards and assessment criteria on a local, state, national or regional basis;
- developing and implementing internal or external operator accreditation schemes;
- establishing and supporting industry training teams responsible for delivering competency-based programs using a consistent curriculum;
- the continuous review of training programs to assess outcomes and revise the programs where appropriate; and
- establishing and maintaining local demonstration forests for the training and education of the workforce.

References

Andrewartha, R., Raymond, D., Applegate, G. and Wood, D. 2000. Training of trainers in codes of practice for forest harvesting, silvicultural prescriptions and reduced impact logging guidelines: outputs and lessons learnt in the Pacific. In: Bulai, S., Tang, H., Pouru, K. and Masianini, B. (eds) *Proceedings of regional consultation on implementation of codes of logging practice and directions for the future*. Field document No. 3. Pacific Islands Forests and Trees Support Programme, Suva, Fiji. pp 246-253.

Vanuatu Department of Forests. 1999. *Vanuatu reduced impact logging guidelines*. Vanuatu Department of Forests, Port Vila.

ITTO tackles its mission

The implementation of ITTO's ambitious agenda will intensify after decisions made at its Council's 30th session

ITTTO is to send a mission to the five ITTO Congo Basin countries to strengthen sustainable forest management and forest protection there.

This was one of several major decisions made by the International Tropical Timber Council at its 30th Session held 28 May–2 June in Yaoundé, Cameroon. The action implied in the decisions will ensure that the tropical forests agenda continues to move forward at a rapid pace.

The Congo Basin comprises Cameroon, Congo Brazzaville, the Democratic Republic of Congo, Gabon, and the Central African Republic. It contains one-quarter of the world's rainforests and is home to more than half of Africa's biological diversity, including the forest elephant and lowland gorilla.

The Council provided funding for ITTO's Executive Director to send a mission to the Congo Basin countries to assist them in implementing, through sub-regional cooperation, those aspects of the Yaoundé Declaration which coincide with ITTO's objectives. The Yaoundé Declaration was signed in March 1999 by the Congo Basin countries, committing them to conserve large parts of their forest resource. The mission will probably commence before the end of the year.

More work on certification

In another decision, the Council agreed to assist its producer member countries to build capacity in voluntary certification.

Forest certification, which is a way of guaranteeing to consumers that a forest is well managed, is becoming an important requirement for those timber producers wanting to sell their products in international markets.

The decision by Council calls on members to submit project proposals for building capacity in certification. A workshop to be financed from ITTO's Bali Partnership Fund—currently comprising contributions from the governments of Japan, Switzerland and the United States—will also be held. It will bring together a broad range of stakeholders to discuss the principles, frameworks and elements of certification schemes, identify principles and critical elements relevant to the development of standards for certification, review progress being made towards the comparability and equivalence of certification schemes, and

obtain the perspective of buyers' groups towards certification. The workshop, which will be held before the 32nd session of the Council next May, will also assist members in developing suitable project proposals for ITTO funding.

Guidelines for secondary forests

Recognising that the area of secondary forests—those that have been recently logged or otherwise disturbed—is growing quickly in the tropics, the Council decided to look more closely at what was needed for their management. It requested the Executive Director to develop guidelines in collaboration with FAO, IUCN and other relevant organisations for:

- the management of secondary tropical forests;
- the restoration of degraded tropical forests; and
- the rehabilitation of degraded forest lands.

Two consultants will be hired to help develop a set of draft guidelines, which will then be examined by an expert panel. The panel will, in turn, report to the Council at its 32nd session.

'Status of forest management' report planned

While the *Review of progress towards the Year 2000 Objective*, published last year, found significant progress in policy reform in most ITTO producer member countries, it found much less evidence of progress on the ground. A decision made by Council at this session should make a significant contribution to the field-level assessment of progress. It requested the Executive Director to arrange national-level workshops in ten major producer member countries to train officials, forest managers, forest concessionaires and others in the effective application of criteria and indicators, using ITTO-approved formats for reporting. The decision also authorised the Executive Director to prepare and publish a 'Status of tropical forest management report' based on national-level reports by members, meetings with stakeholders, and field visits to random samples of forest management units.

Another, related decision responds to an invitation by FAO for ITTO to co-sponsor an international conference on 'the way forward' for criteria and indicators for sustainable forest management. The Council gave its full support to such co-sponsorship and made up to US\$150 000 available for this purpose from the Bali Partnership Fund.

ITTO to provide staff to UNFF

In a decision dealing with ITTO's role in international and regional organisations and forums, the Executive Director was authorised to second a "highly qualified professional" to the secretariat of the United Nations' Forum on Forests, assuming that funds are made available. During the session,

Forestry experts urge logging training in Africa

Reduced impact logging must be adopted as a matter of urgency, according to a group of Central African forestry experts that met in Yaoundé prior to the 30th Session of the International Tropical Timber Council.

The 1-day workshop was organised by ITTO, IUCN—the World Conservation Union, the Conference on Central African Closed Moist Forest Ecosystems and the United States Forest Service and attended by representatives of forest concessionaires, governments, non-governmental organisations and the international forestry community. Presentations covered topics such as fauna management in concessions, a code of logging practice for Central Africa, the costs and benefits of reduced impact logging, and the training needed for the widespread uptake of good logging practice. The presentations were followed by group discussions.

The meeting called for changes in policy that would lead to long-term concession agreements. Among other benefits, these would result in greater investment and commitment by industry and lead to improved forest management by concessionaires. Another recommendation was to increase the participation of local people in forest planning for reduced impact logging and in the harvesting of forest products.

Participants stressed the urgent need to train the forestry workforce in reduced impact logging. The meeting discussed a proposal being developed by ITTO to establish a reduced impact logging training school for Central Africa, designed to train hundreds of forest workers in good logging practice. Participants provided input that will be used to improve the proposal, which will be submitted to the International Tropical Timber Council for consideration.

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the United States pledged US\$50 000 for this purpose; further funds will be required before the appointment can be made.

IUCN collaboration

A separate decision was devoted to strengthening cooperation between ITTO and IUCN—the World Conservation Union. The Council requested the Executive Director to work with the IUCN Secretariat to:

- improve awareness among the general public of those areas where the objectives, policies and activities of the two organisations coincide;
- strengthen cooperation in the formulation, implementation, monitoring, evaluation and co-financing of ITTO projects, pre-projects and activities;
- ensure that ITTO can participate in the 2003 IUCN World Parks Congress; and
- convene an international workshop in order to share experiences in areas of common interest.

Transboundary conservation is one area of mutual interest that will benefit from closer cooperation. ITTO's transboundary reserve network now spans some 8 million hectares of tropical forest, while IUCN boasts impressive expertise in the management of such reserves through its World Commission on Protected Areas, which comprises over 1 000 experts from more than 140 countries. The planned workshop, for which the Council made funds available through the Bali Partnership Fund, will afford an excellent opportunity for the process of collaboration to begin.

Illegal logging in Indonesia

The Council approved and financed a project to develop and implement guidelines to stop illegal logging in Indonesia.

International attention on illegal logging and illegal trade has intensified in recent years; many observers see both as major impediments to sustainable forest management and forest conservation. Moreover, they create price instability and undermine timber markets.

The project in Indonesia, which will be financed by the governments of Japan and the United States, will implement a pilot study on ways to control illegal logging in production

and protected areas in Riau and West Kalimantan. Outputs from the study will be used to develop guidelines for overcoming illegal logging nationwide.

Meanwhile, the Council continued its debate on the problems of illegal logging and the illegal timber trade. Delegates heard that the underlying causes of these problems are complex and that they deprive governments, forest owners and local communities of significant revenues and benefits. However, a decision on action by the Organization was not taken during the Session, other than to approve and finance the Indonesian project. The Council will continue to consider the issue at its next session.

More projects funded

All up, the Council agreed to fund 25 projects, pre-projects and activities worth about US\$9 million. Among these were two projects and two pre-projects to be implemented in Congo Basin countries. One will boost management of the Mefou and Afamba Valley forest near Yaoundé and another will help to improve training at Cameroon's Mbalmayo National School of Forestry. A project to establish a gorilla sanctuary on the border between Cameroon and Gabon was approved; the governments of Switzerland, Japan and the United States expressed interest in funding it once Gabon has submitted a proposal for work on its side of the border.

The 31st session of the Council is scheduled for 29 October–3 November 2001 in Yokohama, Japan.

Producers

Africa

Cameroon
Central African Republic
Congo
Côte d'Ivoire
Democratic Republic of
the Congo
Gabon
Ghana
Liberia
Togo

Asia & Pacific

Cambodia
Fiji
India
Indonesia
Malaysia
Myanmar
Papua New Guinea
Philippines
Thailand
Vanuatu

Latin America

Bolivia
Brazil
Colombia
Ecuador
Guyana
Honduras
Panama
Peru
Suriname
Trinidad and Tobago
Venezuela

Consumers

Australia
Canada
China
Egypt
European Union
Austria
Belgium/Luxembourg
Denmark
Finland
France
Germany
Greece
Ireland
Italy
Netherlands
Portugal
Spain
Sweden
United Kingdom
Japan
Nepal
New Zealand
Norway
Republic of Korea
Switzerland
United States of America

Fellowships awarded

Twenty-six fellowships were awarded at the 30th session of the International Tropical Timber Council in May–June. Awardees were:

Ms Rita Gabriela Gutierrez Perez (Bolivia); **Mr Thelmo Muñoz Rodriguez** (Bolivia); **Ms Chelsia Moraes Ferreira** (Brazil); **Mr Claudio Henrique Soares Del Menezzi** (Brazil); **Ms Reine Félicité Eteta'a Edzambi** (Cameroon); **Mr Bikando Michel Issekou** (Cameroon); **Mr Takem Bienvenu Mbi** (Cameroon); **Mr Joseph Matahala** (Central African Republic); **Ing Olga Lucia Ospina Arango** (Colombia); **Mr Jose Fernando Ortiz Ramirez** (Colombia); **Mr Bernard Nsiah** (Ghana); **Ms Margaret Sruku-Lartey** (Ghana); **Ms Twydale Nkasi Martinborough** (Guyana); **Ing Nelson Arturo Díaz Cerezo** (Honduras); **Dr Surendran Thekkumbad** (India); **Ms Vijay Laxmi Tiwari** (India); **Dr Mohan Varghese** (India); **Mr Waluyo Eko Cahyono** (Indonesia); **Dr Yadi Setiadi** (Indonesia); **Ms Sing Yeng Wong** (Malaysia); **Ms Namrata Sharma** (Nepal); **Ms Puspa Rawal** (Nepal); **Mr Stewart Havini Serawe** (Papua New Guinea); **Ms Violette Colan Colan de Chero** (Peru); **Mr Alfredo Jr Rabena Racoma** (Philippines); **Mr Gervais-Ludovic Itsoua-Madzous** (Republic of Congo).

Reducing impact on forest stakeholders

'Partnership' is the key word in Tasmania's approach to forest practice regulation

by Graham Wilkinson

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TASMANIA—an island state of Australia—has 3.4 million hectares of forest, of which 39% is in formal reserves, 30% is available as public multiple-use forest and 31% is privately owned. The state's forest practices system began in 1985 with the introduction of the Forest Practices Act. The objective of the Act is "to achieve sustainable management of Crown and private forests".

Forest regulation

Forests themselves tend to be remarkably well behaved; forest regulation is primarily concerned with regulating *human* behaviour. The attitudes and behaviour of governments, industry, landowners, communities and other stakeholders determine the effectiveness and efficiency of regulatory regimes.

The choice of a regulatory regime depends on the interplay of factors such as: social attitudes; the proportion of operations within the public and private sectors; the type of forest operations; institutional arrangements within government; and the availability of skills and resources in both the government and private sectors. In many jurisdictions, an emphasis on government regulation and litigation has led to an increasing spiral of tightening regulations. Such processes impose considerable costs on both industry and government and often result in systems that only achieve the minimum standards necessary to avoid penalties, rather than the pursuit of excellence. In contrast, a more self-regulatory approach with appropriate safeguards can avoid unnecessary bureaucratic costs, provide greater flexibility and autonomy for industry, and deliver improved environmental performance.

Tasmania's regulatory regime can be described as one of self-regulation by the forest sector, with oversight and independent enforcement by the government through a Forest Practices Board established under the Act. The membership of the Board comprises expertise and experience in the management of public and private forests, forest harvesting, local government and environmental management. The system is based on a philosophy of cooperation, which is achieved through the development of partnerships.

Key partnerships

Partnership between government and private landowners

The Board fosters a partnership between government and private landowners that recognises the rights of landowners and provides benefits in terms of resource security and streamlined approval processes. In return, private landowners agree to comply with the legally enforceable Forest Practices Code. The partnership also recognises the principle of 'duty of care', through which landowners have agreed to reserve land from logging, up to prescribed thresholds, in order to protect natural and cultural values. The reservation of land beyond the thresholds is deemed to be for community benefit and on this basis is subject to voluntary arrangements or the payment of compensation.

Partnership between government and the forest industry

This partnership recognises that all parties have a collective responsibility to ensure that forestry operations are properly

planned and conducted. Foresters employed by industry can be appointed under the Forest Practices Act as forest practices officers. These officers have a statutory responsibility to plan and supervise their operations to ensure compliance with the requirements of the Act and Code. In return, forest practices officers may be given the power to approve plans. To support these officers, the industry funds a research and advisory program within the Forest Practices Board, which conducts research and provides specialist advice to the officers in the areas of botany, zoology, soils, water, geomorphology, cultural heritage and visual landscape quality.

Partnerships between government agencies

In Tasmania we have tried to overcome the traditional adversarial relationship between 'production' and 'conservation' agencies by fostering a partnership approach. A good example of this relates to the management of threatened species within wood production forests. A streamlined, efficient process has been developed that allows forest practices officers to make scientifically validated decisions on routine matters with a minimum of bureaucracy. In return for this benefit, the industry is prepared to fund further research as part of a program of continuing improvement.

Partnerships between the forest industry and the rural community

The forest industry has developed a Good Neighbour Charter, in partnership with the main representative body of the rural sector, to address concerns that may arise with neighbours as a result of forestry operations. We have found that direct consultation with neighbours generally leads to a more pragmatic and reasonable outcome than might result from a more bureaucratic or adversarial approach.

Comment

Striving for sustainable forest management can place increasingly onerous demands on the resources and skills that are available within both the governmental and private sectors. The regulation of forest practices in Tasmania involves a large number of landowners and forest companies. Neither the government nor the majority of forest companies has, in isolation, the resources to deliver best-practice forestry across all sectors in an effective and efficient manner. Collectively, partnership arrangements have facilitated the development of a progressive forest practices system through the sharing of resources and responsibilities.

Compliance with codes of forest practice can be achieved through either a cooperative or adversarial approach. Partnerships by their nature require a cooperative approach that achieves mutually agreeable outcomes. The continuing challenge for Tasmania's forest practices system is to maintain a spirit of cooperation and to avoid regulatory changes that would lead to a more adversarial and punitive system. This means a commitment at all levels to the maintenance and further development of partnerships among all key stakeholders.

A locally developed log-extraction technique is reducing damage to the peat swamp forests of Peninsular Malaysia

by Alastair Sarre

ITTO Secretariat
Yokohama, Japan



The Rimbaka Timber Harvester in action in peat swamp forest near Kuantan, Peninsular Malaysia. Photo: A. Sarre

EMPLOYEES of Rimbaka Forestry refer to themselves as “born-again loggers”. For three decades or more, the company has logged its forest concessions in the conventional—and highly damaging—way common in the tropics. Recently, though, it started introducing reduced impact logging (RIL) to its operations.

Rimbaka Forestry operates in peat swamp and mixed hill dipterocarp forest near Kuantan in the Peninsular Malaysian state of Pahang. Its logs supply a sawmill that produces about 6 000 m³ of sawn wood per month, most of which is exported to Europe, the United States and elsewhere.

The impetus for the change in forest management was provided partly by the company’s desire to have its forests certified as well managed, and partly by the State government, which is insisting that concessionaires conform to the Malaysian *Criteria, indicators, activities and standards of performance* (MC&I). The MC&I, which are based on the ITTO *Criteria and indicators for sustainable forest management*, specify a range of forest management standards that loggers must achieve. For example, the density of skid trails must be less than or equal to 300 m per hectare and overall disturbance should be less than 30% of the surface area of the logged compartment.

According to Rimbaka Forestry chairman Dato’ Dr Wong Yeon Chai, such a standard cannot be met using conventional machinery—tractors. So he set about developing his own, tailor-made piece of logging equipment.

This machine, dubbed the Rimbaka Timber Harvester, is a mobile highlift with an extended boom and a powerful winching system. It operates like a mobile highlead yarding system: a cable is dragged into the forest from the skid trail and attached to the log. The log is lifted and then winched to the track by the harvester, the long boom enabling the front of the log to be raised off the ground, thereby reducing damage caused by the passage of the log through the forest. The machine is prevented from toppling by its grapple, which grabs hold of

a log or other support on the ground and thereby acts as a counterbalance. The grapple is also used to place the logs along the side of the skid trail, eliminating the need for local log landings.

Besides reducing the damage caused by the log as it is dragged over the ground, the ability to winch logs for up to 150 m on flat terrain means that the density of skid trails can be greatly reduced over that required for bulldozers. A recent survey by forest monitoring company SGS (MALAYSIA) SDN BHD found that the average length of skid trails in forest logged with the Rimbaka Timber Harvester was less than 40 m per hectare, well below the threshold required under the MC&I. The same survey found that the total area damaged by the harvesting operation was about 15%, which is 50% below the MC&I threshold.

The company is now testing the machine in mixed dipterocarp hill forest. It is expected to perform better there than in the peat swamp forest because the terrain will enable the harvester to lift the front end of the logs from the ground at a greater distance from the machine. This means that the density of skid trails can be lower than in peat swamp forest.

Innovative harvesting technology such as the Rimbaka Timber Harvester is not, on its own, sufficient for achieving RIL. The company is also improving its harvest planning, including pre-harvest inventory of standing trees and the marking of trees for felling and retention. It is confident that such measures will ensure that the peat swamp forest will support a second harvest within 20 years. It should also ensure that the company retains access to the forest, since the State government is likely to look favourably on those companies practising responsible forest management.

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Life-cycle analysis could be a boon for timber, but how should the tropical trade take advantage of it?

by Michael Adams

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ALONG with prices, optimism in the tropical timber trade seems to be declining. But while markets almost everywhere—China being the notable exception—remain depressed, there is some good news for timber. It's all in an acronym: LCA.

LCA stands for life-cycle analysis, which is a method of measuring the total impact of a product on the environment, from the extraction of the raw materials, through the manufacturing process, to the product's service life and its eventual disposal or recycling. LCAs measure, among other things, 'embodied energy'—the energy used to produce, transport, process and maintain the product—so that similar products made of different materials can be compared. LCAs also take into account the extent to which resources are depleted or damaged in the manufacture, use and disposal of the product.

LCA has been attracting attention as a methodology for realistically comparing the 'environmental friendliness' of different materials. And, for the first time in a long while, wood is getting some positive press. A new report by the UK Department of the Environment and Transport has found that windows made of timber are more environmentally friendly than those made of polyvinyl chloride (PVC), a kind of plastic. For example, the PVC window system tested was found to consume over three times more energy in the production phase, while the energy consumption for wood windows was attributable mainly to the coatings applied to the wood to reduce weathering. In addition, wood windows were found to generate significantly less waste than PVC throughout the life-cycle. The environmental organisation Greenpeace is reportedly urging architects and specifiers to use windows made of timber over PVC because of its superior environmental performance.

The UK study is not the only recent evidence pointing to the advantages of wood. Work in Australia by the Forest and Wood Products Research and Development Corporation and other work in Malaysia on meranti has confirmed the superior environmental qualities of wood

compared to its steel, aluminium, concrete and plastic competitors.

But the good news must be tempered on two fronts. The first is that any timber produced using unsustainable harvesting techniques and/or environmentally unsound processing methods will almost certainly fail in LCA comparisons, even against steel and PVC. The articles in this *TFU* devoted to reduced impact logging demonstrate the considerable challenge faced by the industry in adapting logging techniques to minimise forest damage while at the same time maintaining reasonable profits.

Housing 'stops'

The other cause for worry is the current state of the market and its immediate prospects. House-building is a very useful guide to economic activity and is a leading indicator of demand for wood products for construction, joinery and furniture and fittings. Recent figures for the world's biggest economies reinforce concerns about the global economic slowdown and give little encouragement to timber producers.

As *Figure 1* shows, housing starts in the United States have fallen from their peak of 2–3 years ago but have weathered the economic downturn fairly well so far. They began to decline in mid 2000, but the drop was minimal. Total starts in 2000 amounted to 1.60 million units, compared to 1.68 million units in 1999.

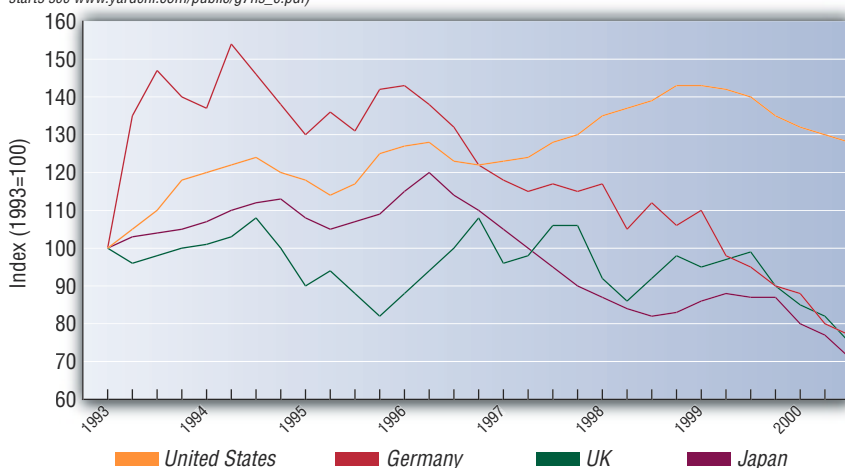
The prospects seem gloomier in the near future. Even though mortgage rates are likely to fall, forecasts suggest that total US housing starts will reach only 1.47 million by year's end. While tropical hardwoods are not widely used in construction, the markets for tropical timber in the joinery, fittings and furniture sectors have been hit badly and prices have declined. Next year may again show some improvement, with starts estimated to climb to about 1.53 million units.

The picture is even darker in Japan, where house-building is stagnant at levels well below those of the early 1990s (*Figure 1*). In April, Japan's Forestry Agency released its projections of wood supply and demand for 2001; it predicted that total demand would be less than 2000. Demand for lumber could be 3.6% less than last year and the first drop in three years, while the volume of plywood will also decline due to slower housing starts, which have been sluggish since the beginning of this year. Overall demand for building materials is expected to stay very weak.

Adding to the problem is the dollar/yen exchange rate, which has moved from 108–109 yen per dollar at the beginning of this year to 124–125 in March/April. Such a big change was unexpected and importers were unprepared. Since the market is so depressed importers are unable to pass on the high exchange costs to end-users and are currently having to absorb the losses.

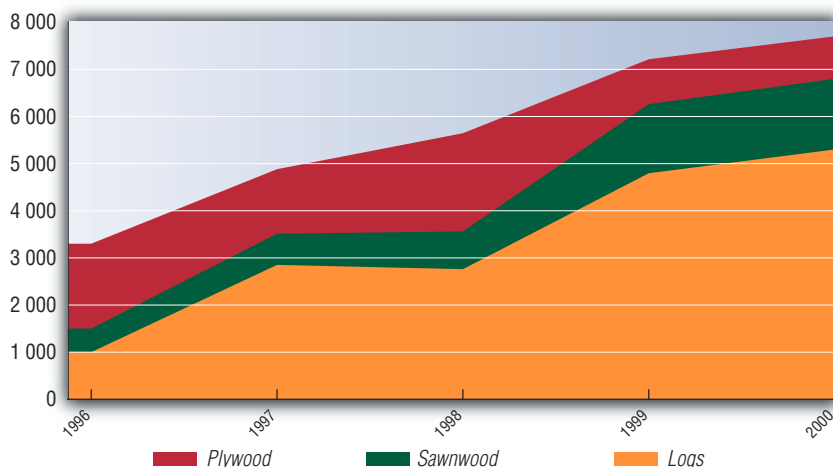
Housing crisis

Figure 1: Housing starts in the G7 group of countries, 1993–2000 (For a comprehensive dataset of housing starts see www.yardeni.com/public/g7hs_c.pdf)



Logging on

Figure 2: China's imports of tropical plywood, sawnwood and logs, 1996–2000 ('000 m³)



In Germany, one of the biggest housing markets in Europe, new orders for residential building have been falling for the past two years and plunged further at the end of 2000. This compounds recent worries about a sharp decline in German business confidence.

Prospects for the German economy within a slowing euro-zone are being viewed with concern. Chancellor Schröder has acknowledged that official forecasts of 2.6–2.8% economic growth this year will be hard to reach. Average growth predicted by the nation's leading economic institutes has been revised sharply downwards to 2.1% in 2001 and 2.2% in 2002.

While no one is predicting a recession in Germany, growth of around 2% is a far cry from the 4.4% growth achieved in the first half of last year (before declining rapidly in the second half to just 1%). An overall growth rate of 3% last year was still the country's best performance since re-unification but all the countries in the 12-nation euro-zone except Italy did better.

The story in the UK is not much rosier: housing starts had been ticking along only to fall in the first quarter of this year. By the time this article goes to press the European Central Bank will no doubt have buckled to pressure to lower interest rates and this could help at least to set a bottom to the decline in residential housing.

Lower economic growth and housing starts in the main consumer countries have had a significant impact in tropical producer countries. Prices for tropical timbers have at best remained flat or, as with plywood, have fallen again after modest gains at the end of last year.

China continues to shine

There is some good news in the marketplace: China. You could say the trade is bullish on China since there is little else to be bullish on.

Demand will increase in 2001

China's markets for wood products have changed considerably since the introduction of the Natural Forest Protection Program. The huge reduction in domestic log harvests, first felt in 1998, led to a massive increase in imports and significant changes in domestic consumption.

The Chinese government is committed to maintaining current economic growth through active fiscal policies and this will further stimulate demand for wood. Moreover, since this is also the first year of the country's 10th Five-year Plan, many large infrastructure projects have been initiated.

Competition among importers

For two years now, competition between log importers in China has been fierce, often to the detriment of the market. The volume of log imports has been climbing in recent years (Figure 2) and both the sources of logs and the range of species have widened considerably. While this process is expected to continue this year, the new element will be a focus on log shipments of smaller quantities and imports of more high-grade logs.

Although the consumption of wood is expected to increase this year, market demand is unlikely to be as feverish as over the past two years, when it was characterised by periods of frantic imports followed by overstocking and price-cutting. Chinese analysts point to a growing maturity in the business that will moderate such wild swings. Purchases are now

more likely to be driven by demand than speculation, and log stockpiles will start to shrink. Overall, analysts expect log imports to fall from current levels, while sawnwood imports will likely increase further in the medium term.

Trading futures

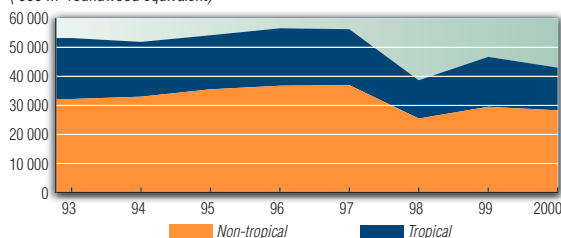
All this negative news leaves the tropical timber trade at risk to more competition. Even Chinese demand will moderate over coming months and years, and arresting the decline in the export markets of Europe, the us and Japan will take considerable effort. Where in its life-cycle does the trade now sit? Can it renew itself? Without doubt it faces considerable challenges—environmental and economic—to stay competitive with other products and, in particular, with other timbers. To regain market share the trade must go on the offensive to promote tropical hardwoods; LCA might just provide the clarion call the trade needs.

CORRECTION

The two figures accompanying the article 'The ups and downs of North Asia' by Mike Adams and Jairo Casteño in *TFU* 11/1 were incorrect. They should have appeared as shown below.

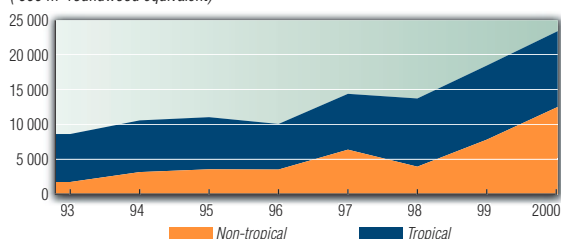
Japan imports

Figure 1: Japan's primary timber product imports, 1993–2000 ('000 m³ roundwood equivalent)



China imports

Figure 2: China's primary timber product imports, 1993–2000 ('000 m³ roundwood equivalent)



Lessons from Japan's forest sector

by Mohd Adnan B. Ali

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I WAS AWARDED an ITTO Fellowship to spend more than four months in Japan last year with the Japan International Research Center for Agricultural Sciences (JIRCAS).

During the period I participated in field studies for a forest engineering course on forest machinery, road construction, forest management, planning and harvesting. In particular, the course concentrated on the theories and practical application—in an actual logging operation—of a cable logging system using a mobile tower yarder. It included cable system set-up, operation, dismantling and maintenance.

My studies were conducted at a number of Japan-based institutions, including the Forestry and Forests Products Research Institute, the Department of Agronomy and

Forestry at Iwate University, the Ryoshin Forest Engineering Institute, the Oikawa Motor Co Ltd (to study the operation and maintenance of forest machines, including the mobile tower yarder), Sōgo Zōrin Co Ltd, the Numata Forest Mechanisation Centre, the Iwate Prefecture Forest Technology Centre, and several others. I also worked in forestry operations in Miyagi and Iwate prefectures. By travelling widely, speaking with a wide range of people and getting 'hands-on' experience in forestry operations, I believe I gained valuable insight into the domestic Japanese forest industry. Perhaps the overriding impression was that the Japanese forest sector is in the business for the long term; all operations are conducted with an extraordinary level of care and a low impact on the environment.

Forest classification

The forests of Japan can be classified by ownership into three categories:

- private forest (shiyūrin): a total area of 14.6 million hectares (59% of the forest area), characterised by a large number of smallholders;
- public forest (kōyūrin): local authorities (shichōsōn) and prefectural governments (kenyūrin) control about 2.7 million hectares of forest. They are often managed with particular emphasis on the public functions and services offered by forests; and
- national forests (kokuyūrin): 7.6 million hectares of forest come under the jurisdiction of the Forestry Agency within the Ministry of Agriculture, Forestry and Fisheries.

Forest types

For management purposes there are three basic types of forest:

- protection forests, which are used in various ways to protect other natural resources, the public and its property from the adverse affects of Japan's weather and unstable soils;
- protected forests, which have the additional role of preserving unique habitats and areas of ecological value; and
- other forest areas, which are available for commercial exploitation, subject to certain restrictions.

Forest planning and activities

In Japan, the main commercial forestry species are sugi or cedar (*Cryptomeria japonica*), hinoki or cypress (*Chamaecyparis obtusa*) and karamatsu or larch (*Larix leptolepis*). Planting is done at a high initial density to quickly shade out the highly competitive weed vegetation. The growing season is short and well defined in Japan but growth is lush and weeding is usually undertaken once or

ITTO Fellowships offered

ITTO offers fellowships through the Freezailah Fellowship Fund to promote human resource development and to strengthen professional expertise in member countries in tropical forestry and related disciplines. The goal is to promote sustainable management of tropical forests, the efficient use and processing of tropical timber, and better economic information about the international trade in tropical timber.

Eligible activities include:

- participation in short-term training courses, training internships, study tours, lecture/demonstration tours and international/regional conferences;
- technical document preparation, publication and dissemination, such as manuals and monographs; and
- post-graduate studies.

Priority areas: eligible activities aim to develop human resources and professional expertise in one or more of the following areas:

- improving the transparency of the tropical timber market;
- improving the marketing and distribution of tropical timber species from sustainably managed sources;
- improving market access for tropical timber exports from sustainably managed sources;
- securing the tropical timber resource base;
- improving the tropical timber resource base, including through the application of criteria and indicators for sustainable forest management;
- enhancing technical, financial and human capacities to manage the tropical timber resource base;

- promoting increased and further processing of tropical timber from sustainably managed sources;
- improving the marketing and standardisation of tropical timber exports; and
- improving the efficiency of tropical timber processing.

In any of the above, the following are relevant:

- enhancing public relations, awareness and education;
- improving statistics;
- research and development; and
- sharing information, knowledge and technology.

Selection criteria: Fellowship applications will be assessed against the following selection criteria (in no priority order):

- consistency of the proposed activity with the Program's objective and priority areas;
- qualifications of the applicant to undertake the proposed fellowship activity;
- the potential of the skills and knowledge acquired or advanced under the fellowship activity to lead to wider applications and benefits nationally and internationally; and
- reasonableness of costs in relation to the proposed fellowship activity.

The maximum amount for a fellowship grant is US\$10 000. Only nationals of ITTO member countries are eligible to apply. The next deadline for applications is **29 August 2001** for activities that will begin no sooner than December 2001. Applications are appraised in May and November each year.

Further details and application forms (in English, French or Spanish) are available from Dr Chisato Aoki, Fellowship Program, ITTO; Fax 81-45-223 1111; itto@itto.or.jp (see page 2 for ITTO's postal address).

twice a year for the first 5–6 years after planting. Pruning of all stems begins when diameter-at-breast-height reaches 10 cm and two or three lifts are performed during the plantation cycle.

Since initial stocking is high, thinning is necessary to allow the correct distribution of increment and also to admit additional light to the forest floor and thereby stabilise the soil. This is done 3–4 times before clearfell.

Forest operations and harvesting

Forest harvesting is most commonly done as a highly mechanised clearfell operation. A variety of methods are used, but I studied most closely the use of a mobile tower yarder. This is a harvesting machine used for carrying, yarding and lifting the logs from stump to roadside. The machine is easy to move, having a telescopic or foldable tower, but the operator and assisting crew must nevertheless be well trained to use this machine efficiently and safely. Such training includes knowing how to set up the cables (skyline, mainline and haul-back line) and to fit the wire ropes. These machines are very suitable for thinning or clearfelling and their use reduces the density of forest roads.

A wide range of cable logging systems is used in Japan. It includes the endless-tyler, hoist carriage, self-propelled hoist carriage, running skyline, h-shaped skyline and double skyline systems.

The Ryoshin mobile tower yarder

One of the systems I studied was the Ryoshin mobile tower yarder, a highly efficient system that can operate at distances of up to 500 m. One advantage over some other yarding systems is the ease with which it can be set up and operated, reducing labour requirements. It can be used for uphill, downhill and lateral yarding.

A special model of the Ryoshin mobile tower yarder may be suitable for cable logging in tropical forest. The Ryoshin type RME 500TM was sent to Malaysia for a collaborative study between JIRCAS, the Forest Research Institute of Malaysia and Kumpulan Pengurusan Kayu Kayan Terengganu, Malaysia (KPKKT). The machine has been put into operation in the KPKKT concession to test both its technical feasibility and its ability to reduce logging damage.

Fellowship reports available

The following ITTO fellowship reports are available on request from the authors:

Variation in growth and wood traits among provenances of *Calycophyllum spruceanum* Benth. from the Peruvian Amazon

Contact: Mr Carmen Sotelo Montes, Programme for the Domestication of Agroforestry Trees, International Centre for Research in Agroforestry, Av. La Universidad 795, Apartado 1558, Lima 12, Peru; c.sotelo@cgiar.org

Multi-species glued laminated timber

Contact: Mr Calvin Nguedjio Fouepe, PO Box 13632, Yaoundé, Cameroon; nguedjiofouepe@yahoo.fr

Biodiversite, ecologie et structure de la forêt de la region de Bipindi—Lolodorf—Akomi II

Contact: Mr Hubert Ngoumou Mbarga, c/o Abbé Jean Mbarga, BP 7287 Yaounde, Cameroon; hngoumou@uycdc.uninet.cm

Análisis silvicultural de la regeneración natural de dos tipos de bosque de Podocarpus en San Ignacio, Cajamarca—Perú

Contact: Mr. Segundo Vaca Marquina, Bolivar 1342 Jaén, Peru; 19980469@correo.lamolina.edu.pe

Conservation of indigenous tropical tree species: genetic variability in eleven provenances of iroko (*Milicia excelsa*)

Contact: Mr Mark Appiah, Department of Forest Ecology, Unit of Tropical Silviculture, University of Helsinki, PO Box 28 (Koetilantie 3) Fin-00014, Finland; appiah@LadyBird.helsinki.fi

Demand forecast and analysis of Ghanaian certified timber products in the UK and US

Contact: Dr Timothy Afful-Koomson, International Environment and Resource Policy Program, The Fletcher School of Law and Diplomacy, Tufts University, Medford MA 02155, USA; koomson@netzero.net

Cable logging workshop

9–12 October 2001

Christchurch, New Zealand

Cost: US\$650

This 4-day workshop will present the advantages and disadvantages of cable logging and introduce the requirements in engineering design, technique and equipment systems needed to make cable logging productive. Like any harvesting method, cable logging must be environmentally acceptable and economically feasible. The workshop will discuss the different cable systems, their advantages and disadvantages, and the different techniques used to meet environmental and economic requirements.

Contact: Forest Engineering Inc, 620 SW 4th St, Corvallis Oregon 97333, USA; Tel 1-541-754 7558; Fax 1-541-754 7559; office@forestengineer.com; www.forestengineer.com

Championing reduced impact logging

International conference on the application of reduced impact logging to advance sustainable forest management

26 February–1 March 2001
Kuching, Sarawak

This conference was attended by more than 260 people from 36 countries representing government agencies, private companies and industry associations, non-governmental organisations, universities and international forestry organisations. Major financial and in-kind support was provided by the Food and Agriculture Organization of the United Nations (FAO), ITTO, the USDA Forest Service, the United States Agency for International Development, the Centre for International Forestry Research, the Tropical Forest Foundation, Cirad-Forêt, the Indonesian Ministry of Forestry, the Sarawak Forestry Department and the Sarawak Timber Association. A wide range of papers was presented covering the key technologies for improving forest harvesting, the dire need for more training in RIL techniques, the financial costs and benefits of RIL, safety and health issues, practical experiences in the introduction of RIL in forest operations, and other aspects. The conference emphasised that RIL was an essential element of sustainable forest management but was not, by itself, sufficient for achieving it. Participants called on governments, industry, research institutions and international organisations to cooperate in furthering uptake. The following recommendations were made:

For governments

- provide an enabling environment for RIL and sustainable forest management, including provision of secure resource tenure and investment climate, appropriate resource pricing, fiscal incentives, and the elimination of policies that discourage improved forest management;
- strengthen monitoring of forest harvesting practices and enforcement

of regulations pertaining to RIL and sustainable forest management;

- develop and implement industry operating standards and competency criteria, and support through appropriate training programs, operator accreditation schemes and promotion of occupational health and safety;

For forest industry

- show commitment to good forest management by adopting RIL and working towards sustainable forest management;
- enhance skills and capabilities of employees through training and raising awareness of the environmental, social and economic implications of forest harvesting;
- develop payment and incentive systems for forest workers that promote and reward quality performance and efficiency in forest harvesting;

For international organisations

- support human resource development to enhance capacities at all levels, from forest workers to policy makers, for effective implementation of RIL;
- support the transfer of appropriate technology and facilitate the sharing of information and experiences related to RIL and other aspects of sustainable forest management;
- foster development and raise awareness of innovative mechanisms for encouraging the adoption and application of RIL (eg certification, forest-based carbon offsets, and other payments for the environmental benefits of sustainable forest management);

For research

- develop and apply standardised methods for assessing the costs and benefits of specific components of RIL so as to allow comparison of operational studies and to promote acceptance of results by all stakeholders;
- assess RIL in the context of sustainable forest management, with due consideration to damage reduction, timber productivity, the conservation of biological diversity, and social welfare;

- give priority to practical applied research that supports the adoption of RIL practices by timber harvesting organisations.

The proceedings of the conference will be published later this year. For more information contact: Thomas Enters, FAO Regional Office for Asia and the Pacific, Maliwan Mansion, Phra Atit Road, Bangkok 10200, Thailand; Thomas.Enters@fao.org

Improving iroko, improving international cooperation

The ITTO/FORIG odum project

15–16 November 2000
Kumasi, Ghana

by Douglas Pattie

ITTO Secretariat
itto@itto.or.jp

One of the challenges for researchers working with certain prime commercial timber species is to facilitate the next generation of pest-resistant clones. One such species is *Milicia excelsa*, known in the tropical timber trade as iroko or, in Ghana, odum. An indigenous species in sub-Saharan Africa, it is valued for its natural durability and good working properties but over-exploited in the natural forests of Ghana, Côte d'Ivoire and Cameroon. From the early stages of development, iroko falls prey to the insect *Phytolyta lata* that stunts its growth and affects stem shape and size. This gall-forming insect also reduces the regeneration rate of the species and hampers its establishment in plantations.

This conference was the final activity conducted under ITTO PROJECT PD 3/95 REV.2 (F) *Conservation and provenance plantings and integrated pest management to sustain iroko production in West Africa*. The project was implemented by the Forest Research Institute of Ghana (FORIG) and involved collaboration with SODEFOR (Côte d'Ivoire), ONADEF (Cameroon), Form Ecology Consultants (the Netherlands), the Northern Arizona University (USA), the University of Aberdeen (Scotland), the

University of Firenze (Italy), the National University of Côte d'Ivoire, the University of Ghana, the University of Helsinki (Finland), the Forestry Department of Kenya, the Forestry Department of Sierra Leone and the Forest Research Unit of the Democratic Republic of Congo.

Over 200 attendees discussed and debated the results of the project, which included research into breeding strategies for the genetic improvement of the species and its use in plantations, agroforestry and natural forest regeneration. Participants presented papers on germination trials, seedling survival trials, the identification of genetic variability, and the experimental testing of seedling pathogens. A wide range of collaborative approaches was used to investigate the critical problem of progressive improvement of iroko in natural forest and past failures in establishing the species in plantations.

The difficult task of obtaining propagules that resist *Phytolyma* gall attack may be aided by iroko's wide ecological tolerance: the species occurs in forests ranging from dry semi-deciduous to wet evergreen. Germplasm was collected across West and East Africa (Sierra Leone, Côte d'Ivoire, Ghana, Tanzania and Cameroon) and screened for *Phytolyma* resistance using the conventional procedure of provenance and progeny field trials. Researchers noted that establishment success was higher for seeds collected in drier forests.

Pathogen identification research work in Côte d'Ivoire and Italy was considered in a session addressing the variety of potential pathogens that can be isolated from *Milicia* seedlings. The research suggested that one species, *Fusarium solani*, was predominant and appeared to be more common in dry forests than in wet forests.

Conference participants realised that high genetic variability between and within iroko populations can be used to advantage in integrated pest management programs. Strong evidence was discovered that planting iroko in provenance mixtures and in low densities significantly reduced susceptibility to galling. Management of the pest can be further improved by fostering populations of indigenous natural enemies.

Overall, the project has broadened the cooperative program in Africa between Anglophone and Francophone research and development institutes and has improved the North-South dialogue on genetic pest resistance. A great deal of international cooperative work during the project has been directed at selecting individual resistant lines to be perpetuated and mass-produced for plantation establishment. The European Community component of the project focused on identifying parent trees which produce seeds relatively resistant to drought and fungal pathogen attack, complementing the multinational African research program on resistance to galling.

With the closing of PD 3/95 REV.2, a successor project has been submitted to ITTO by the government of Côte d'Ivoire entitled *Genetic resistance of iroko to Phytolyma lata*. This project, if funded, will focus on the continued genetic improvement of iroko for plantations through the selection of resistant seeds and individuals and the implementation of asexual reproduction. Project activities are proposed that will establish conservation plots of various iroko provenances, an arboretum of trees selected for their resistance to *Phytolyma*, and the increase of cutting production from cloned individuals.

For further information contact Dr Joe Cobbinah, FORIG Director, Ghana; Tel 233-51-60123; Fax 233-51-60121; dir@forig.org

Andean forestry unites

1st meeting of Andean forestry chambers and associations

29-31 January 2001
Quito, Ecuador

by Antonio Villa Lopez

Colombia
avilla@cable.net.co

This meeting, which was organised by the Ecuadorian Association of Timber Industries (AIMA) and funded by ITTO, brought together representatives of the private and public forestry sectors from the five Andean countries—Bolivia, Colombia, Ecuador, Peru and Venezuela—along with representatives of companies and organisations from elsewhere, including ITTO. The meeting had three main goals: to evaluate the status of forestry in each country from the perspective of the private sector; to review progress made with the use of criteria and indicators (C&I) and other tools for sustainable forest management (SFM); and to assemble and set into operation an Andean Forestry Chamber. Topics considered were the use of C&I for SFM in the native tropical forests of the region (day 1), exchange of experiences and case-studies of C&I applications in the region (day 2), and forestry certification of native forests as a tool towards SFM (day 3).

In parallel, the meeting convened four working groups to discuss: 1) the role of ITTO and its relations with the five Andean countries; 2) joint project proposals for bilateral and multilateral cooperation; 3) competitiveness and markets within the Andean region and other countries; and 4) the formation of the Andean Forestry Chamber.

For more information on the outputs of the meeting, contact: Mr Jose Franco M., AIMA; aima@latinamail.ec

► **Innes, J. and Haron, A. (eds) 2000.** *Air pollution and the forests of developing and rapidly industrializing countries. IUFRO Research Series, No 4.* CABI Publishing, Wallingford, UK. ISBN 0 85199 481 4. 264 pp. £49.95

Price, M. and Butt, N. (eds) 2000. *Forests in sustainable mountain development. A state of knowledge report for 2000. IUFRO Research Series, No 5.* CABI Publishing, Wallingford, UK. ISBN 0 85199 446 6. 264 pp. £75

Available from: CABI Publishing, Wallingford Oxon OX10 8DE, UK; Fax 44-(0)-1491-828 292; orders@cabi.org; www.cabi.org

CABI Publishing and the International Union of Forestry Research Organisations (IUFRO) are publishing a 'research series' that "seeks to provide a single, uniform forum and style that ... the users of information will ... see as a reliable and reputable source". These two books broach issues of importance for tropical forestry. In the first, for example, at least seven papers report air pollution/forestry problems in the tropics, summarising the effects of forests on air pollution and vice versa in Southeast Asia, India, Latin America and elsewhere. The second of the two books contains several dozen papers ranging from case-studies of mountain forests under threat, to global reviews and syntheses on a broad suite of issues relating to mountain forest functions, cultures, policies, management and research.

► **Karsenty, A. 2000.** *Economic instruments for tropical forests: the Congo Basin case. International Institute for Environment and Development, London.* ISBN 2 87614 376 3. 85 pp + 2 annexes.

English version available from: Earthprint Ltd, Orders Dept, PO Box 119 Stevenage Hertfordshire SG1 4TP, UK; Fax 44-1438-748844; orders@earthprint.co.uk; www.iied.org

Original French version (published 1999) available from: La librairie du Cirad, Avenue Agropolis (Bât. 4) BP 5035, 34032 Montpellier Cedex 1, France; Fax 33-4-6761 5547; librairie@cirad.fr

This thoughtful report draws on economic theory and experiences in the countries of central Africa to assess the use of different economic instruments for

promoting sustainable forest management and sustainable development. It concludes that the context within which tropical forestry takes place requires "original, flexible combinations of regulations and economic instruments". It calls for the replacement of administered systems with market mechanisms, royalties with auctions and taxes with marketable permits. "Care must be taken, however, not to confuse efficiency with ideology: a mechanism may be theoretically efficient, but the economic, political or institutional conditions may not be right for it to work". Moreover, market mechanisms "should always be overseen by a regulatory policy defined and implemented by government, and administrative regulation is still necessary to oversee management practices."

► **Casson, A. 2000.** *The hesitant boom: Indonesia's oil palm sub-sector in an era of economic crisis and political change. CIFOR Occasional Paper No 29.* CIFOR, Bogor. ISSN 0854-9818. 37 pp +8 appendices.

Contreras-Hermosilla, A. 2000. *The underlying causes of forest decline. CIFOR Occasional Paper No 30.* CIFOR, Bogor. ISSN 0854-9818. 25 pp.

Available from: Center for International Forestry Research, PO Box 6596 JKPWB, Jakarta 10065, Indonesia; Fax 62-251-622 100; cifor@cgiar.org; www.cifor.cgiar.org

Both these papers examine the causes of deforestation. The first concludes that while the growth of the oil palm subsector has conferred important economic benefits, it poses "an increasing threat to Indonesia's natural forest cover" and has also displaced local communities and resulted in social conflict. The author makes a number of recommendations, including that oil palm concessions should be allocated only to companies that can demonstrate they will in fact establish plantations rather than just exploit the timber. There should also be greater consultation with local communities. The second paper is concerned less about deforestation where environmental losses are compensated by economic gains and improved well-being of the poor than with "inappropriate or wasteful" deforestation and forest degradation. It provides a very interesting review of the literature on this subject and draws on research conducted by

CIFOR. The author concludes, perhaps not very usefully, that "despite the inclination of many analysts to attribute undesirable forest decline to a 'dominant' factor such as trade or population growth, it is far more plausible that forest decline is the result of an elaborate 'cocktail' [of causes]".

► **Filer, C., Dubash, K. and Kalit, K. 2000.** *The thin green line: World Bank leverage and forest policy reform in Papua New Guinea. The National Research Institute, PNG and the Australian National University, Canberra. NRI Monograph 37.* ISBN 9980-75-107-X.

Available from: The Publications Sales Coordinator, National Research Institute, PO Box 5854, Boroko NCD 111, PNG; Tel 675-236 0300; Fax 675-326 0213; nri@global.net.pg or The Bookshop, Research School of Pacific and Asian Studies, Australian National University, Canberra ACT 0200, Australia; Tel 61-2-6249 3422; Fax 61-2-6279 9975; http://rspas-bookshop.anu.edu.au

This monograph tells the story of the World Bank's effort to influence forest policy in Papua New Guinea by way of conditions attached to a series of structural adjustment loans offered to the national government between 1995 and 1999. PNG is one of the few countries in which the Bank has sought to influence national forest policy in this way, and one of an even smaller number of client countries in which it can claim to have had some success in doing so. This case-study therefore throws important light on current international debates about the Bank's engagement with the exploitation or conservation of natural tropical forests and about its choice of policy instruments for achieving its environmental goals.

From Clement Victor, PNG

Edited
by
Alastair
Sarre

Brazil's ambitious forest program

The Brazilian Ministry of Environment recently published the country's National Forest Program. This document describes the context within which the Program was developed, its objectives, its justification, its key areas of development or 'thematic lines', and a strategy for its implementation. The thematic lines are: expansion of the planted forest resource; expansion and consolidation of native forest management in public areas; management of native forests in private areas; monitoring and control; traditional and indigenous populations; forest education, science and technology; forest environmental services; institutional strengthening and forest extension; modernisation of forest-based industries; and the marketing and trade of forest products.

The cost of this ambitious program is not given in the document. However, possible funding sources are described: the potential pool of financial resources is estimated at US\$359 million per year. Of this, US\$100 million is forecast to come from non-government organisations and social movements, and US\$10 million from international cooperation grants such as those provided by ITTO.

Copies of the program in Portuguese or English can be ordered from: Ministério do Meio Ambiente—MMA, Centro de Informação e Documentação Luís Eduardo Magalhães—CID Ambiental, Esplanada dos Ministérios—Bloco B—Térreo, 70068–900—Brasília—DF, Brazil; Tel 55–61–317 1235; Fax 55–61–224 5222; cid@mma.gov.br

Indonesia issues first sustainable forest certificate

The Indonesian Ecolabelling Institute (LEI) awarded a certificate of good forest management last April to PT Diamond Raya Timber, a company based in Riau Province in central Sumatra, according to *The Jakarta Post*. PT Diamond owns a 91 000-hectare concession in the area and was granted the certificate after an audit conducted by SGS Qualifor, a company accredited by both LEI and the Forest Stewardship Council. LEI Executive Director Dradjad Wibowo said that four more forest concessionaires representing a further 812 000 hectares of forest were being audited for possible certification. Three other timber companies have been dropped from the auditing list for their inability to meet certification standards.

PNG establishes ITTO group

The recently formed Papua New Guinea (PNG) ITTO Committee held its inaugural meeting at the PNG National Forest Service headquarters in Port Moresby last March. The committee is made up of representatives of the PNG National Forest Service, the Office of Environment and Conservation, the PNG University of Technology, the University of Papua New Guinea, the PNG Forest Research Institute, the PNG Eco-forestry Forum, PNG Forest Industries, and the Association of Foresters of PNG. One of the main tasks assigned to the committee is to screen ITTO project proposals before they are submitted for approval to the ITTO Expert Panel for the Technical Appraisal of Project Proposals.

Reported by Clement Victor, Lae, April 2001

Cameroon suspends logging by 32 companies

The Government of Cameroon ordered 32 logging companies to suspend their activities because they had failed to pay taxes amounting to US\$4.1 million, according to press reports. The Minister for the Environment and Forestry, Mr Syvestre Naah Ondoua, said that the 32 companies were no longer authorised to fell, transport and export wood from their concessions. He said that the companies should be fined for breaking the law, and that logging would not be permitted to resume until the taxes were paid. He also said that logging activities are to be monitored by the forestry administration and an 'international observer body' in order to add transparency to the activities of timber companies.

Reported by Parfait Mimbimi Esono, Yaoundé, May 2001

Point of view ▶ *continued from page 32*

low by the deluge of commodity-grade timbers soon to arrive from the global plantation estate. How, then, will forest owners capture the rent they need to justify keeping natural forest as natural forest? RIL is a good start, because it will mean that the forest will be more productive—and capable of supporting a second harvest sooner—than it would be if logged in the currently standard way. But it won't be enough.

It is painfully obvious that sustainable forest management means, as Chris Maser put it more than ten years ago, that "we must change our way of thinking and to change our way of thinking we must transcend our special interests". RIL is a start in that direction but it is not much more than a first, almost hesitant step; the troubles with RIL show that we have a long,

long way to go. Foresters can help accelerate progress along the track but only if we shake off our predilection for "change without a major upheaval in the affected industries", which some adherents have suggested RIL can bring. That is impossible: major upheaval is coming and sustainable forest management is but one of the factors that will bring it about. It is, however, the one factor over which we can exercise some control. So let's stop fantasising about change without upheaval, substitute doing for talking about RIL, and start applying very greatly reduced impact logging with a sense of urgency.

Reference

Sheehan, P. 2000. Gottstein Trust report 'Enculturation of sustainable forest management systems: learning from the Canadian experience.' *Appita journal* 53(2).

Making contact

Pham Quang Vinh has been conducting research into the domestication of

multipurpose, indigenous tree species for use in agroforestry in northern Vietnam. *Contact: SFTC—Vietnam Forestry University, Hatay Province, Vietnam; sfsp.xm@hn.vnn.vn*

Fang Zhigang and **Wang Yiping** are conducting research on bamboo pests in China. They advocate an integrated pest management approach that follows principles of simplicity, effectiveness, economy and control. *Contact: Fang Zhigang at Zhejiang Forestry College, China; panjj@263.net*

The Protected Areas and Wildlife Division of the Department of Environment and Natural Resources in the Western Mindanao Region of the Philippines would like to make contact with professionals involved in protected areas management, biodiversity conservation and community-based ecotourism. Our main functions include: recommending policies, guidelines, plans and programs and project proposals on the establishment and management of protected areas; implementing policies and guidelines on biodiversity conservation and management; coordinating the implementation of biological and genetic resource prospecting; and implementing a coastal environment program.

Contact: Eduardo Bisquera, Protected Areas and Wildlife Division, DENR, Region 9, Zamboanga City, Philippines; Tel 63-62-991 3435; Fax 63-62-991 9012; pawd@zambo.i-next.net

Ecuador's legislation

Sir

I refer to the article entitled 'Bringing C&I to ground' by Dr Freezailah, Don Wijewardana and Ing. Marco Vinueza (*TFU* 10/4).

The article states that "in Ecuador, the high national-level awareness of sustainable forest management is yet to be translated into enabling legislation". This is completely false.

Ecuador has incorporated the following five basic sustainable forest management principles and criteria into its forest legal framework through the reform of regulations to the Forestry and Natural Areas and Wildlife Conservation Law of 5 March 2000:

- I **production sustainability:** the timber products harvesting rate shall not exceed the natural regeneration rate of those products in the forest;
- II **maintenance of forest cover:** natural forest areas shall be maintained under forest use;
- III **conservation of biodiversity:** the conservation of flora and fauna species, as well as the characteristics of their habitats and ecosystems, shall be ensured;
- IV **joint responsibility in management:** sustainable forest management systems will be implemented with the participation and under the control of forest landholders. Those in charge of implementing integrated management plans and sustainable forest harvesting programs shall assume joint responsibility; and
- V **reduction of negative environmental and social impacts:** sustainable forest management practices shall be aimed at reducing damage to natural resources and at promoting the development of local communities.

Subsequently, on 24 July 2000, Ecuador issued its *Sustainable forest management standards for timber harvesting in moist forests and forest plantations*, which translate the above five principles and criteria into verifiable indicators to monitor compliance with sustainable forest management principles in the forest.

It is unfortunate that an Ecuadorean national, as one of the co-authors of the article, should be unaware of the significant progress made by Ecuador towards the achievement of sustainable forest management.

Rodolfo Rendon B.

Minister for the Environment

Ecuador

13 March 2001

Translated from the Spanish by Claudia Adan

The authors* respond:

We are grateful to the Hon. Rodolfo Rendon B., Minister for the Environment, for clarifying the position regarding the

application of sustainable management criteria to the forest legal framework in Ecuador.

We held extensive discussions with various forestry stakeholders in Ecuador including officials of relevant government agencies, which included the Ministry for the Environment. These discussions left us in no doubt about the government's commitment to sustainable forest management. During these deliberations we were made aware of the reforms of regulations to the Forestry and Natural Areas and Wildlife Conservation Law of 5 March 2000 (Rule 124 and Rule 131), to which the Minister refers. We were also made to understand that while these were regulations enacted under the existing legislation, a new law encompassing sustainable management was awaiting approval by Parliament. Since a regulation does not have the same level of standing as a law we made the statement that the high level of national awareness is yet to be translated into enabling legislation. This was to reflect the actual situation and was not intended to belittle the efforts of the Minister in implementing sustainable forest management. We trust this helps clarify the matter.

While we understand the draft legislation is yet to be enacted, we want to reiterate our finding from the Latin American workshop on criteria and indicators that Ecuador has made major advances in implementing sustainable forest management among the Latin American countries. The five areas covered in the regulation clearly show the Minister's commitment to sustainable management. The enactment of the proposed new law will enhance the institutional capacity to further this objective more effectively.

Don Wijewardana and Marco Vinueza

**Dr Freezailah, a co-author of the article, collaborated in the Asia-Pacific workshops but was not involved in the workshop in Ecuador*

7 May 2001

C&I workshop held

The fourth workshop in a series to train trainers on the use of the *ITTO Manual on the application of criteria and indicators for the sustainable management of natural tropical forests* was held in Sangmelima, Cameroon last January. The first such workshop was held in Kuala Lumpur in April 2000, the second in Bogor in July and the third in Ecuador in September. The Cameroonian workshop, attended by 24 mostly government forestry officials, completes the initial series. A much larger program of training workshops funded at the recent session of the International Tropical Timber Council (see page 16) will train several hundred private- and public-sector foresters in applying the criteria and indicators at the forest management unit level.

Ernesto F. Sanvictores, erstwhile Chairman of the International Tropical Timber Council, died on 29 April 2001 aged 71



MR SANVICTORES made outstanding contributions to the development of the tropical timber industry, not only in his home country, the Philippines, but also within the ASEAN and Asia-Pacific regions as well as to the international tropical forestry fraternity, particularly ITTO.

He served for several terms as either President or Chairman of the Board of Directors of the Philippine Wood Producers Association. He was also president and chief executive officer of his own Aras-asan Timber Company and a director of several other companies.

ITTO was especially honoured by the election of Mr Sanvictores as the sixth Chairman of the International Tropical Timber Council in 1991, when global concern for the conservation of tropical forests was probably at its highest. Mr Sanvictores steered the Council through the myriad of issues and challenges confronting

the sector. Among the milestones achieved by the Council under his chairmanship were the adoption of the strategy for the attainment of the ITTO Year 2000 Objective, initiation of the renegotiation process for the International Tropical Timber Agreement, the establishment of the Finance Committee, the adoption of the ITTO *Guidelines for the establishment and sustainable management of planted tropical forests*, and initiation of the development of the ITTO *Guidelines for the conservation of biological diversity in tropical forests*. In ensuing years, Mr Sanvictores kept in continuous contact with ITTO and contributed particularly to the successful convening of the 20th Session of the Council in Manila in 1996.

With the passing away of Mr Sanvictores, we have lost not only a great personality but also someone who worked hard to further ITTO's objectives both at home and on the international scene. Survived by five children, he will be sorely missed.

ITTO Secretariat

For more information on the conference contact: Mr Gabriel AZIZET, Director General of the Department of Forestry and Fisheries, Libreville, Gabon; Tel 241-760062; Fax 241-766896; boussengath@internet.gabon.com

Clarification

ITTO project PD 34/99 REV. 2 (1) is developing and implementing stress grading rules for tropical timber in the Philippines and not the F-house as stated in *TFU* 11/1 (page 8). Development of the F-house was supported through the ITTO fellowship program and the Philippine Department of Science and Technology Grants-in-Aid Program.

Useful sites on the internet

Peruvian timber

This site, maintained by Peru's National Chamber of Forestry (Camara Nacional Forestal del Peru), contains information on the timber market, including international timber supply and demand, news, product promotion, and timber prices from the country's main forestry production zones.

www.madebolsaperu.com

Language: Spanish

PNG research

Papua New Guinea's National Research Institute has a website in English containing general information about the institute, research visas and a research database. It also contains information on research programs in the fields of economic studies, educational research, political and legal studies, and social and environmental studies. The Institute has published several monographs on PNG forest policy, which can be ordered through the Publication Sales Coordinator, NRI, PO Box 5854, Boroko NCD 111, PNG; Tel 675-326 0300; Fax 675-326 0213; nri@global.net.pg or via the website. Information on costs is provided on the website.

www.nri.org.pg

Language: English

PNG ecoforestry

The PNG Eco-forestry Forum website contains information on this non-governmental organisation, including its objectives, publications, activities and recent news.

www.ecoforestry.org.pg

Language: English

Further work on further processing

ITTO, in collaboration with the African Timber Organization (ATO), is holding a conference on the further processing of African tropical timber. The conference, which will be held in Libreville, Gabon, on 26-28 September 2001, is one of the follow-up actions arising from the decision taken by the International Tropical Timber Council to strengthen cooperation between ITTO and ATO. It has three objectives: to determine the constraints that hinder the development of the timber sector in tropical Africa; to promote investments in timber processing in the region; and to increase the dialogue between ITTO and ATO. It is also expected that the conference will help in the development of novel strategies to increase timber processing in the region and in the harmonisation of policies between West African nations for growth in the sector.

Participatory appraisal workshop

17–21 September 2001 Edinburgh, UK
Cost: £260–440

This workshop will concentrate on the practical application of participatory appraisal, with three days spent on practical exercises and other methods for learning appropriate techniques. The remaining two days will include placements in Edinburgh and the surrounding area and will provide an opportunity for the practical application of the approach.

Contact details given below.

Environmental consensus and conflict resolution workshop

25–27 September 2001 Edinburgh, UK
Cost: £280–380

This workshop aims to demonstrate how consensus building can be used in planning to prevent or resolve conflicts. It is designed for decision-makers actively involved in environmental or other public policy matters or with managing conflicts concerning natural resources. It will apply theory and consensus building skills in a practical way, using case-study material provided by the participants themselves.

Contact: Office of Lifelong Learning, CPD Unit, University of Edinburgh, 11 Buccleuch Pl, Edinburgh EH8 9LW, UK; Tel 44–131–651 1180; Fax 44–131–651 1746; Lisa.Ellis@ed.ac.uk

An introduction to agroforestry

October–December 2001 Bangor, UK
Cost: £5 400 + accommodation

This 12-week course examines agroforestry practices, their relevance in farming and forestry systems, and the ecological, economic and social principles that influence them. With the help of practical exercises, students will: understand the value of trees for soil fertility and erosion control; be able to carry out forest and woodland inventories for woodland management and ecophysiological measurements; specify associative tree ideotypes; know how to uncover indigenous knowledge and science; and design agroforestry interventions.

Contact details given below.

An introduction to agroforestry and forest ecology

October–December 2001 Bangor, UK
Cost: £5 400 + accommodation

This 12-week course provides an understanding of the ecological information needed for the management and conservation of tropical forests. It also examines agroforestry practices, their relevance in farming and forestry systems, and the ecological, economic and social principles that influence them. Assessment and research methods for biodiversity assessments, forest survey and inventory, the monitoring of species regeneration and forest dynamics and socio-economic survey techniques will be introduced and practised.

Contact details given below.

Commercial tropical forestry

November 2001–February 2002 Bangor, UK
Cost: £5 400 + accommodation

This 12-week course provides an introduction to the principal concepts and practices underlying the ecology, economics and management of forests and

MSc in agroforestry

The principal aim of this 12-month, annually run course is to provide a specialist education and training in agroforestry as a land use to meet human needs from farming and forestry systems. It has two parts: a formally taught element that runs from September to April, and a subsequent, four-month element in which students research a specific area of interest and produce a dissertation.

Contact: Dr Zewge Teklehaimanot, Course Director, School of Agricultural and Forest Sciences, University of Wales, Bangor, Gwynedd LL57 2UW, UK; Tel 44–1248–382 639; Fax 44–1248–354 997; z.teklehaimanot@bangor.ac.uk

MSc in forest industries technology

This 12-month course provides training in aspects of science, technology and commerce relevant to the wood processing industries. It comprises ten formally taught modules and original research work that forms the basis of a masters' dissertation.

Contact: Dr Martin Breese, Course Director, School of Agricultural and Forest Sciences, University of Wales, Bangor, Gwynedd LL57 2UW, UK; Tel 44–1248–382 503; Fax 44–1248–354 997; m.c.breese@bangor.ac.uk

MSc in tropical environmental forestry

This 12-month course provides interdisciplinary education and training in subjects of current and future importance for forest management in the tropics. It combines traditional forestry methodologies with detailed coverage of modern approaches to the assessment and protection of biodiversity and other components of the environment, sustainable production, participatory forest management, forest restoration and 'appropriate technology'.

Contact: Dr Jeremy Williams, Course Director, MSC Environmental Forestry, School of Agricultural and Forest Sciences, University of Wales, Bangor, Gwynedd LL57 2UW, UK; Tel 44–1248–383 708; Fax 44–1248–354 997; j.h.williams@bangor.ac.uk; www.safs.bangor.ac.uk

woodlands and the utilisation of timber and non-timber forest products. These are considered within the broader social and political context of natural resource management.

Contact details given below.

Forest management

January 2002–March 2002 Bangor, UK
Cost: £5 400 + accommodation

This 12-week course covers the principal concepts and practices underlying the management and utilisation of timber and non-timber forest resources and the basic economics behind forestry and agroforestry decision-making. Students will also have the opportunity to look at the principles of remote sensing, GIS and environmental impact assessment and their use in land resource management.

Contact details given below.

Forest resource economics and project management

January 2002–February 2002 Bangor, UK
Cost: £2 700 + accommodation

This 6-week course will introduce students to the basic economics behind forestry and agroforestry decision-making and enable them to understand economic appraisals of various land use options. Students will experience a diversity of timber and non-timber products—their processing, utilisation and marketing. The principles of project management will be introduced, providing the procedures and tools necessary for the design, funding and management of projects in general.

Contact: Short Course Organiser, CAZS, University of Wales, Bangor Gwynedd LL57 2UW, UK; Fax 44–1248–36 4717; cazs@bangor.ac.uk; www.cazs.bangor.ac.uk

By featuring these courses, ITTO doesn't necessarily endorse them. Potential applicants are advised to obtain further information about the courses of interest and the institutions offering them.

▶ 10–12 July 2001. **International Symposium on Mangroves.** Tokyo, Japan. **Contact:** Nobutaka Hanagata, Research Centre for Advanced Science and Technology; hanagata@bio.rcast.u-tokyo.ac.jp; www.bio.rcast.u-tokyo.ac.jp/symposium

▶ 11–19 July 2001. **Travelling Workshop on Linking the Complexity of Forest Canopies to Ecosystems and Landscape Function.** Portland and Corvallis, USA. IUFRO 2.01.12. **Contact:** Michael G. Ryan, USDA/FS Rocky Mountain Research Station, 240 West Prospect RD, Fort Collins, CO 80526-2098, USA; Tel 1-970-498 1012; Fax 1-970-498 1027; mryan@lamar.colostate.edu

▶ 22–27 July 2001. **Tree Biotechnology: the Next Millennium.** Skamania Lodge, Stevenson, Washington, USA. **Contact:** Dr Steven Strauss, Forestry Sciences Lab 020, Department of Forest Science, Oregon State University, Corvallis Oregon 97331-7501 USA; Tel 1-541-737 6558; Fax 1-541-737 1393; strauss@fsl.orst.edu; www.cof.orst.edu/cof/extended/conferen/

▶ 25–28 July 2001. **Communities in Flames: An International Conference on Community Involvement in Fire Management.** Balikpapan, Indonesia. **Contact:** Organization Committee, PO Box 6596 JKPWB, Jakarta, Indonesia; Fax 62-251-622 100; cbfm@cgiar.org

▶ 12–15 August 2001. **Supply Chain Management for Paper and Timber: 2nd World Symposium for Logistics in the Forest Sector.** Vaxjo, Sweden. **Contact:** Kim Sjostrom, Chief Technologist, Anjas 3 A 33, 02230 Espoo, Finland; Tel 358-405-500 780; sjostrom@technologist.com; honeybee.helsinki.fi/logistics/main.htm

▶ 12–18 August 2001. **Forest Modelling for Ecosystem Management, Forest Certification and Sustainable Management.** Vancouver, Canada. **Contact:** Dr. Valerie LeMay, Dept of Forest Resources Management, 2045-2424 Main Mall, University of British Columbia, Vancouver BC V6T 1Z4 Canada; Tel 1-604-822 4770;

Fax 1-604-822 9106; forestmd@interchange.ubc.ca; www.forestry.ubc.ca/forestmodel

▶ 24 August 2001. **CELOS Management System: Post-harvest Silvicultural Interventions in Natural Production Forest over the Past 30 Years: Adjustment or Application.** Suriname. **Contact:** Kenneth Tjon, CELOS, Leysweg 14, Paramaribo, Suriname; Tel 597-439 982; Fax 597-498 069; ktjon@hotmail.com

▶ 27–29 August 2001. **Asian Wetland Symposium: Bringing Partnerships into Good Practice.** Penang, Malaysia. **Contact:** Ahyaudin B. Ali, AWS 2001 Secretariat, Minden, Penang 11800, Malaysia; Tel 60-4-860 3181; Fax 60-4-656 5125; ahyaudin@usm.my

▶ 3–14 September 2001. **Developing the Eucalyptus of the Future.** Valdivia, Chile. IUFRO. **Contact:** Dr Roberto Ipinza, Universidad Austral de Chile, PO Box 1241, Valdivia, Chile; Tel 56-63-216 186; Fax 56-63-224 677; ripinza@valdivia.uca.uach.cl; www.infor.cl/iufro2001

▶ 12–14 September 2001. **Dynamics of Forest Insect Populations.** Aberdeen, Scotland. IUFRO 7.03.07. **Contact:** Dr Andrew Liebhold, USDA Forest Service, Northeastern Forest Experiment Station, Forestry Sciences Laboratory, 180 Canfield St, Morgantown, West Virginia 26505, USA; Tel 1-304-285 1609; Fax 1-304-285 1505; sandy@gypsy.fsl.wvnet.edu; iufro.boku.ac.at/iufro/iufro.net/

▶ 9–14 September 2001. **5th International Flora Malesiana Symposium.** Sydney, Australia. **Contact:** Dr Barry Conn, Royal Botanic Gardens Sydney, Mrs Macquaries Road, Sydney NSW 2000, Australia; fmv@rbgsyd.gov.au; plantnet.rbgsyd.gov.au/fm/fm.html

▶ 11–14 September 2001. **Dynamics of Forest Insect Populations.** IUFRO 7.03.07. **Contact:** Andrew Liebhold, USDA Forest Service, Northeastern Forest Experiment Station, 180 Canfield St Morgantown WV 26505, USA; sandy@gypsy.fsl.wvu.edu

▶ 12–15 September 2001. **104th Annual Convention and Exhibit Showcase of the US National Hardwood Lumber Association.** New Orleans, USA. **Contact:** Debby Whitten; d.whitten@natlhardwood.org; www.natlhardwood.org

▶ 19–21 September 2001. **Continuous Cover Forests: Assessment, Analysis, Scenarios.** Göttingen, Germany. IUFRO 4.00.00. **Contact:** Klaus v. Gadow, Universität Göttingen, Institut für Forsteinrichtung und Ertragskunde, Büsingenweg 5, D-37077 Göttingen, Germany; kgadow@gwdg.de; sstacho@uni-forst.gwdg.de

▶ 23–28 September 2001. **International Conference on Advancing Community Forestry: Innovations and Scaling up Experiences.** Chiang Mai, Thailand. **Contact:** Dr Somsak Sukwong, Executive Director, Regional Community Forestry Training Center for Asia and the Pacific (RECOFTC), Kasetsart University, PO Box 1111, Bangkok 10903, Thailand; Fax 662-561 4880; ftcscs@ku.ac.th; www.recoftc.org

▶ 24–29 September 2001. **The Art and Practice of Conservation Planting.** Taipei, Taiwan Province of China. IUFRO 1.07.00; 1.17.00. **Contact:** Ching-Te Chien, Taiwan Forestry Research Institute, 53 Nan-Hai Road, Taipei, Taiwan 10051; Fax 886-2-2389 5531; chien@serv.tfri.gov.tw

▶ 26–28 September 2001. **Joint ATO/ITTO Conference on Further Processing of African Tropical Timber.** Libreville, Gabon. **Contact:** Mr Gabriel Azizet, Director General of the Department of Forestry and Fisheries, Libreville, Gabon; Tel 241-760062; Fax 241-766896; boussengath@internet.gabon.com

▶ October 2001. **The Future of Perennial Crops: Investment & Sustainability in the Humid Tropics.** Côte d'Ivoire. **Contact:** Dominique Nicolas, CIRAD, Boulevard de la Lironde, 34398 Montpellier Cedex 5, France; Tel 33-4-6761 6569; Fax 33-4-67 56 59; nathalie.mercier@cirad.fr

▶ 2–5 October 2001. **5th Brazilian Symposium on Forest Transportation.** Porto Seguro, Brazil; Tel 31-3899 52125; Fax 31-3891 2166; sijf@mail.ufv.br

▶ 9–15 October 2001. **Forest History in the Mountains of the World.** Naini Tal, Central

Himalaya Region, India. IUFRO 6.07.01. **Contact:** Prof. Rawat, C2B/32C Janakpuri, New Delhi, India; or at 2B Sleepy Hollow, Naini Tal 263001, India; Tel 91-5942-36149; Fax 91-5942-36260;

▶ 1–3 October 2001. **International Conference on Forestry and Forest Products Research (CFFPR 2001).** Kuala Lumpur, Malaysia. **Contact:** Dr Shamsudin Ibrahim/Ms Safiah Yusoff, Forest Research Institute Malaysia, Kepong, 52109 Kuala Lumpur, Malaysia; Tel 603-6274 2633; Fax 603-6277 9643; sham@frim.gov.my or safiah@frim.gov.my; www.frim.gov.my/CFFPR2001.html

▶ 1–3 October 2001. **International Seminar on the Effects of Climate Change on Forest Growth and Implications for Forest Management.** Dresden, Germany. IUFRO 4.01.08. **Contact:** Heinz Röhle; roehle@forst.tu-dresden.de; www.forst.tu-dresden.de

▶ 8–11 October 2001. **Forestry Meets the Public: an International Seminar.** Ruttihubelbad, Switzerland. **Contact:** Martin Buchel, Chief, Bases and Training, Swiss Forest Agency, Ch-3003 Berne, Switzerland; Tel 41-31-324 7783; Fax 41-31-324 7866; martin.buechel@buwal.admin.ch

▶ 9–12 October 2001. **2001 International Symposium on Value Accounting of Forestry Environment.** Beijing, China. Sponsored by ITTO. **Contact:** Executive Chair, Mrs Yuling, Institute of Scientist-tech Information, Chinese Academy of Forestry, Wan Shou Shan, Beijing, China; Tel 86-10-6288 8322; Fax 86-10-6288 4836; yuling@isti.forestry.ac.cn; www.forestry.ac.cn

▶ 29 October–2 November 2001. **Extension: Assisting Forest Owner, Farmer and Stakeholder Decision-making.** Lorne, Australia. **Contact:** Rowan Reid, Agroforestry and Farm Forestry Program, Dept of Forestry, University of Melbourne Vic 3010, Australia; Tel 61-3-8344 5011; Fax 61-3-9349 4172; rfr@unimelb.edu.au; www.mtg.unimelb.edu.au/iufro.htm

▶ 29 October–3 November 2001. **31st Session of the International Tropical Timber**

Council. Yokohama, Japan. **Contact:** Collins Ahadome; itto@itto.or.jp; www.itto.or.jp

▶ 30 October–2 November 2001. **Forest Science and Forest Policy in the Americas: Building Bridges to a Sustainable Future.** IUFRO Task Force on Science/Policy Interface. **Contact:** John Parotta, USDA Forest Service R&D-SPPII, 201 14th St, SW, PO Box 96090, Washington, DC 20090-6090, USA; jparotta@fs.fed.us

▶ 11–16 November 2001. **XV Latin American Congress of Soil Science.** Cuba. **Contact:** Dr R. Villegas Delgado, Ave Van Troi No. 17203, Boyeros, Havana CP 19210, Cuba; Tel 53-7-579076; Fax 53-7-666036; XV@inica.edu.cu

▶ 20–24 November 2001. **4th Machinery and Timber Products Show and 5th Plywood and Tropical Timber International Congress.** Belém, Brazil. **Contact:** WR São Paulo; Tel 55-11-3721 3116; wr_sp@uol.com.br; www.tropicalcongress.com.br

▶ 8–20 April 2002. **Alternative Ways to Combat Desertification: Connecting Community Action with Science and Common Sense.** Cape Town, South Africa. **Contact:** Ms Roben Penny, Woodbine, Essex Road, Kalk Bay, Cape Town 7975 South Africa; Tel 27-21-788 1285; robenpen@jaywalk.com; http://des2002.az.blm.gov/homepage.htm

▶ 27 May–1 June 2002. **32nd Session of the International Tropical Timber Council.** Denpasar, Indonesia. **Contact:** Collins Ahadome; itto@itto.or.jp; www.itto.or.jp

▶ 11–17 November 2002. **Collaboration and Partnerships in Forestry.** Santiago, Chile. IUFRO 6.00.00 (All divisions). **Contact:** Susanna Benedetti, Instituto Forestal, Casilla 3085, Santiago, Chile; Tel 56-2-693 0722; Fax 56-2-638 1286; sbenedet@infor.cl

▶ 21–28 September 2003. **XII World Forestry Congress.** Quebec City, Canada. **Contact:** XII World Forestry Congress, PO Box 7275, Charlesbourg, Quebec G1G 5E5, Canada; www.wfc2003.org

Point of view ▶

The trouble with RIL

Reduced impact logging is a requirement of sustainable forest management, but it falls well short of being the complete answer

by Alf Leslie

*f c/o Awamutu Copy Centre
(New Zealand), 64-7-871 5686*

THESE IS, I suspect, a widespread feeling that reduced impact logging (RIL) represents a major, even the decisive, advance needed towards sustainable forest management in the tropics.

The truth, unfortunately, is that it does not and it does not because, for a start, we have not yet worked out anything more than a rudimentary understanding of where RIL fits in with sustainable forest management. We know that RIL must be part of it, which would be a good start if we only knew what sustainable forest management really was—but that we do not.

A recent, critical review of sustainable forest management concluded that it is “an incomprehensible blur” (Sheehan 2000). In logic if not timing, sustainable forest management is the application to forests of sustainable development, which became the norm for resource use accepted by the world community as an outcome of the United Nations Conference on Environment and Development in 1992—“development that meets the needs of the present without compromising the ability of future generations to meet their own needs”. For the most part, definitions of sustainable forest management contain similar vague and comforting terms—an inevitable outcome of the process by which sustainable forest management has been and still is being formulated. Talking about an issue is much easier and more comfortable than trying to do something about it. Those who get enjoyment from such a process have a vested interest in keeping it going. Hence the “interminable international chanting of conferences, papers, reports, books, websites, seminars, symposiums ... etc” on the issue found by Sheehan.

There is no doubt that RIL will be an improvement on the damage done and the mess left by the logging practices which are almost standard in tropical forests and still fairly common in temperate forests. But it will not automatically bring about sustainable forest management. One of the troubles with RIL, therefore, is that it is a necessary condition for sustainable forest management but not a sufficient one. In fact, it is a long way from being a sufficient condition.

Although we don't yet have an operational

definition of sustainable forest management we can identify a few things that must be included in it. The first is that sustained yield timber production is an essential requirement, implicit in the ‘development’ part of sustainable development. Since forest-based development depends on the industrial use of forest resources, timber harvesting is an unavoidable component of sustainable forest management. But it must be a very tightly constrained sort of timber harvesting. It must conform to at least three conditions:

- there is no long-term disturbance to the stability and dynamics of the forest ecosystem;
- there is no permanent irreversible damage to the environment on which that ecosystem depends or to the environments and societies which depend on the forest ecosystem; and
- it must not hinder and, preferably, should assist regeneration of the harvested parts of the forest in a form that maintains ecosystem integrity.

These conditions set the degree of impact reduction that must be achieved, not the amount of damage or disruption that may be tolerated. The latter—damage tolerance—seems to be the side from which RIL has generally been approached. It is wrong. To come at it from the other end leads us to see that sustainable forest management requires greatly reduced impact logging; in effect, almost zero-impact logging. Thus, another trouble with RIL as presently conceived is that the degree of impact reduction is rarely specified and certainly never to such a drastic level as the virtual elimination of adverse impacts. Yet, like it or not, that is the level of impact required for the strict interpretation of sustainable forest management.

To many, such a requirement must seem the ultimate in impracticability. That may well be so, but it doesn't mean that it cannot be done. Manual logging, helicopter logging, advanced cable logging and animal logging systems can all come very close to zero impact. The real objection is not technical but economic.

This brings me to the problem I see as contributing most to the trouble with RIL. This is the industry-wide problem of the economic implications of RIL as an element of sustainable forest management. It is hard to see that RIL—at the near-zero impact necessary—will not add to the cost of timber production, but even if it does not, as some studies suggest, it is inevitable that the wider requirements of sustainable forest management will. For a start, near-zero impact will require a reduction in harvesting volume. Moreover, the sustainable management of natural forests requires, by definition, the maintenance of natural forests in the long term. At the moment, this is not a profitable land use. Current prices for commodity-grade timbers are already low and will be kept

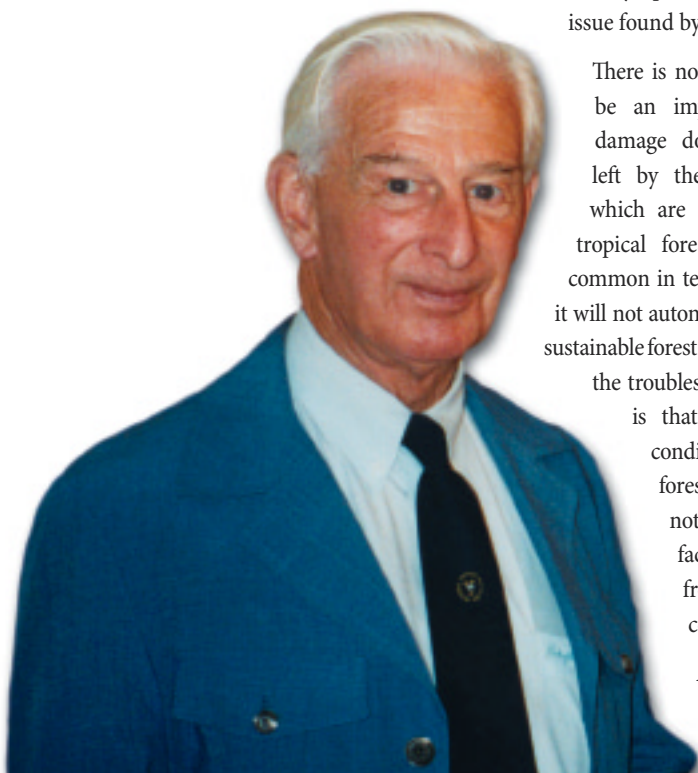


Photo: J. Graham

Continued on page 27