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Maybe we should talk

FORESTERS need to become better communicators; we need to talk more. This doesn't mean more international meetings (we probably need fewer of those), it means talking with communities so that we properly understand their concerns.

In this edition of the *TFU* we explore the emerging concept of forest landscape restoration (FLR). It's not just about techniques that work in a nursery or along a planting line; most importantly it is about the roles, rights and responsibilities of stakeholders and how these can be discerned and accommodated by restoration initiatives. The key to it is talk: face-to-face interaction that gives stakeholders the opportunity to influence decisions and benefit from them. Kusumanto (page 9), for example, says that FLR should be implemented using an action-learning or adaptive-management approach by which stakeholders collaboratively, systematically and deliberately plan, implement and evaluate restoration activities. Gilmour (page 7) describes it as a process of learning through experience, which is well-suited to situations that contain a great deal of uncertainty.

Sounds good in theory; can it be done? The Iwokrama experiment in Guyana, although not FLR, suggests that it can. Olav Bakken Jensen evaluated an ITTO project there which has assisted in the development of the Iwokrama Forest (page 16). He reports that the initiative has enabled local indigenous communities to organise themselves to "speak with one voice" on issues related to the management of the forest. The source of this initiative's strength is innovative legislation enacted by the Guyanese parliament that respects indigenous user rights to the forest, complemented by a broad con-

Inside ▸ forest landscape restoration ▸ logging and wildlife ▸ trade barriers ▸ Council outcomes …

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Contents

Regular features

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Cover image Orang Ulu warrior (Sarawak, Malaysia) in traditional dress. *Photo: Martin Puddy/Getty Images*

... Editorial continued

sultative process and participatory training. According to Jensen, an harmonious relationship has developed between the communities and the Iwokrama initiative, and he is optimistic about the future of forest management there.

Another participatory approach appears to be working for the Ngata Toro community, which occupies an enclave within Indonesia's Lore Lindu National Park. Helmi (page 32) reports that, with outside help, this community has been documenting its local knowledge, customary laws and traditions and mapping its interactions with the environment. This information has been used in a participatory planning process for the long-term management of those parts of their territory that overlap the boundaries of the park.

Talking is important, but sooner or later it must be supported by tangible results. Jensen notes that actual logging is yet to take place in the Iwokrama experiment: the talking and planning have taken years, and still the system hasn't been fully tested. Without the financial rewards there's a strong possibility that at least some stakeholders will become disillusioned, sick of talk, and ready to pursue other routes to economic development and other ways of resolving their conflicts. Maginnis and Jackson (page 4) stress the need to not only tell stakeholders of the benefits, but to deliver them. Proponents say that FLR can bring local economic growth and environmental security, and help reduce poverty; they will have to prove this every time they introduce the concept to a community.

It's not just about immediate financial rewards, either. One of the most important outcomes of the processes pursued by the Ngata Toro community and in Iwokrama has been the formal recognition of traditional community lands, and the granting of access to them. Resolving issues related to land tenure is probably the single most important step in producing better outcomes for forests and their stakeholders. Foresters and forest policymakers around the world are starting to realise this, proving that listening is just as important as talk.

Maginnis and Jackson suggest that practitioners should even take a proactive role in policy development, because they know what works and what doesn't and how policies can impede or facilitate. Actually there's no reason why the forestry profession, with all its problems, can't become a leader in the discovery of creative solutions to conflicts, poverty and the loss of cultural identity. Articles in this edition suggest we are making some headway in this regard, but the success stories are still too few.

And the task is immense. Of all the planet's biodiversity, the human species is by far the most complex. Orangutan might grieve, chimpanzees might deceive their friends, and dolphins might play practical jokes, but no species can match us for the breadth of our emotions, the height of our aspirations or the intricacy of our societies. The tools of the forester are still too primitive; we need to do much more work on our skills in conflict resolution, action learning, adaptive management, participatory planning and policy development—because we want to deal with stakeholders, not spear-throwers.

Alastair Sarre

Restoring forest landscapes

A partnership of international organisations, national governments and NGOs is promoting a landscape approach to forest restoration

THE TERM forest landscape restoration (FLR) was first coined in 2001 by a group of forest restoration experts meeting in Segovia, Spain, which defined it as:

a process that aims to regain ecological integrity and enhance human well-being in deforested or degraded forest landscapes.

Recently, ITTO coordinated the production of a book, *Restoring forest landscapes*, to illuminate the theory and practice of FLR. It draws on the ideas and needs of tropical forest restoration practitioners and is the outcome of close collaboration between a number of institutions, including ITTO, IUCN, the Forestry Commission of Great Britain, WWF International, Intercooperation, CIFOR and the University of Queensland, under the auspices of the Global Partnership on Forest Landscape Restoration. It builds on the ITTO *Guidelines for the restoration, management and rehabilitation of degraded and secondary tropical forests*, which were published by ITTO in collaboration with FAO, Intercooperation, IUCN and WWF International in 2002.

In this edition of the *TFU* we present some edited excerpts from the book, which can be ordered from ITTO (address on page 2).

What is FLR?

While the overall conceptual framework of FLR is new, virtually all the principles and techniques behind the approach have been around for some time and will already be familiar to many forestry practitioners. In essence, FLR is an approach to managing the dynamic and often complex interactions between the people, natural resources and land-uses that comprise a landscape. It makes use of collaborative approaches to harmonise the many land-use decisions of stakeholders with the aims of restoring ecological integrity and enhancing the development of local communities and national economies.

FLR differs from conventional restoration approaches in several ways:

- **it takes a landscape-level view:** this does not mean that every FLR initiative must be large-scale or expensive but rather that site-level restoration decisions need to accommodate landscape-level objectives and take into account likely landscape-level impacts;
- **it uses a 'double filter' approach:** that is, restoration efforts need to result in both improved ecological integrity and enhanced human well-being at the landscape level (see article page 4);
- **it is a collaborative process** involving a wide range of stakeholder groups collectively deciding on the most technically appropriate and socioeconomically acceptable options for restoration (see article page 9);
- **it does not necessarily aim to return forest landscapes to their original state**, but rather is a forward-looking approach that aims to strengthen the resilience of forest landscapes and keep future options open for optimising the delivery of forest-related goods and services at the landscape level; and

Safe hands: a child holds a 'sangre de grado' seedling to be used in the restoration of degraded forest land in an Ashaninka community in the Peruvian Amazon (ITTO project PD 14/98 Rev.1 (F)). *Photo: R. Guevara/ITTO*

- **it can be applied not only to primary forests** but also to secondary forests and degraded and deforested land.

The specific activities of any FLR initiative could include one or more of the following:

- rehabilitation and management of degraded primary forest;
- management of secondary forest;
- restoration of primary forest-related functions in degraded forest lands;
- promotion of natural regeneration on degraded lands and marginal agricultural sites;
- ecological restoration;
- plantations and planted forest; and
- agroforestry and other configurations of on-farm trees.

The book is composed of a series of 'essential reading' chapters on the key principles and techniques of FLR and will serve as a bridge between the policy-level guidance provided by the ITTO guidelines and the context-specific field guides that it is hoped will be developed following national-level FLR workshops to be held during 2005 and 2006.

To find out more about these workshops contact Mr Emmanuel Ze Meka, ITTO Secretariat; rfm@itto.or.jp

Balancing restoration and development

FLR is a tool for ensuring that forest restoration complements development at the landscape scale

by Stewart Maginnis and William Jackson

IUCN

Gland, Switzerland

All there: the 'classic' forest landscape (Lao PDR).
Photo: © Stuart Chape

Changing: the 'secondary forest' landscape (Vietnam).
Photo: © Stewart Maginnis

DEFORESTATION and forest degradation have altered many of the world's tropical forest landscapes to such a degree that at the very most only 42% of remaining forest cover (or 18% of original forest cover) in the tropics is still found in large, contiguous tracts. At least 830 million hectares of tropical forest are confined to fragmented blocks, of which perhaps 500 million hectares are either degraded primary or secondary tropical forest.

Conventional responses to the fragmentation and degradation of forest resources can seldom on their own restore the full range of forest-related goods and services that society requires.

In addition to the large area of fragmented tropical forest, 350 million hectares of former forest land can no longer be classified as forest because of the extent to which they have been degraded by fire, land clearance and destructive harvesting practices. Such areas often remain in a state of arrested succession because the conditions do not support secondary forest regeneration or conversion to other productive land-uses. These areas lack nearly all forest-related attributes (structure, function, productivity, composition) and constitute the greater part of degraded forest landscapes. There also exists an additional 400 million hectares of productive agricultural land that still retains a significant tree component.

1: Using a landscape perspective to enhance site-level management – two case-studies

Early attempts at large-scale reforestation of the Khao Kho district in central Thailand met with violent opposition from landless families, who often resorted to arson in order to prevent plantation establishment. The stand-off was resolved by looking at the broader issues within the landscape, incorporating local people into the project, reallocating about 500 hectares from reforestation to agriculture, and redefining the species' mix and planting configuration to suit both local needs and technical challenges (Marghescu 2001).

Oil-palm plantation managers along the Kinabatangan River in Sabah, Malaysia observed that in some areas of their estate regular flooding prevented them from establishing an oil-palm crop. In collaboration with WWF and local communities, some of these managers encouraged secondary and planted forests to regenerate in affected areas, offering added protection to the rest of the estate while also reducing fertiliser and pesticide run-off to the river, expanding species' habitats and enhancing landscape connectivity for threatened species such as orangutan and forest elephant, and optimising the productivity of the flooded sites (WWF 2002)).

Despite the fact that forest fragmentation, modification and degradation have shaped so many of the world's remaining tropical forests, many national forest strategies still tend to focus on how best to manage and protect intact forest. And, even when national forest programs and strategies do recognise restoration as a priority, they tend to focus activities on the establishment of industrial roundwood plantations. Forest landscape restoration builds on the growing realisation that such strategies alone are insufficient to guarantee a healthy, productive and biologically rich forest estate in the longer term.

What has been missing so far?

Conventional responses to the fragmentation and degradation of forest resources can seldom on their own restore the full range of forest-related goods and services that society requires. Plantation forestry, for example, very definitely has a place in FLR. On their own, however, industrially oriented plantations will rarely replace all the forest functions that have been lost or compromised through landscape-level deforestation, fragmentation and degradation. We therefore need to 'create' space within the landscape so that other, complementary restoration strategies can be deployed. 'Dominant use' is a perfectly legitimate approach to site-level activities, while the achievement of 'multiple functionality' should be the goal of landscape-level management. Thus, a landscape configured so that it accommodates plantations, protected reserves, ecological corridors and stepping stones, regenerating secondary forests and agroforestry systems (or other agricultural systems that make use of on-farm trees) lays the foundation of multiple functionality.

Taking a landscape-level perspective into account in site-level management results not only in potentially healthier landscapes, but also in improved stand-level management, as illustrated in the two case-studies in *Box 1*. Both highlight two key principles that are critical to building a landscape perspective into decision-making:

- **meaningful public participation:** as many as 500 million people live within modified and degraded

Changing: the 'modified' forest landscape (Costa Rica).
Photo: © Alberto Salas

Gone: the 'degraded' forest landscape (Papua New Guinea).
Photo: © David Lamb

forest landscapes in the humid tropics and are dependent on a mixture of agricultural and forest resources to maintain their livelihoods. Practitioners need to realise that landscapes, especially modified or degraded ones, have many different stakeholder groups—each with their own particular needs and priorities. FLR seeks not only to take local people's needs into account but also to involve them actively in the processes of decision-making and implementation; and

- **balancing land-use trade-offs:** it is common to hear about the need to pursue win-win solutions—that is, where two independent outcomes (such as biodiversity conservation and economic development) are maximised through a single intervention. In reality, however, win-win outcomes are extremely rare, particularly at the site level. There are often trade-offs involved between two sets of priorities and there is usually a need to develop compromise solutions. Without a landscape perspective, the same types of compromises tend to be repeated over and over again until key forest-related functions are lost from the landscape. Under an FLR approach, the ecological and economic benefits of FLR *(see Box 2)* complement other approaches to economic development at the landscape scale.

Many of the challenges to making forest landscape restoration work are social, legal and political in nature. For example, ambiguity over ownership rights for timber trees growing on private or communal agricultural land in Ghana during the 1980s and 1990s resulted in many farmers 'ring-barking' ecologically and economically valuable trees; it also made it almost impossible to persuade farmers to invest in tree-planting, even though this would have been beneficial agronomically. Nevertheless, despite these kinds of problems there is nearly always an opportunity for practitioners to take decisions with a landscape perspective.

The Shinyanga case-study

The Shinyanga region in Tanzania used to be covered with dense acacia and miombo woodland, but by 1985 much of the landscape had been transformed into semi-desert. Significant areas of forests had been cleared under colonial tsetse fly eradication schemes and some of the remaining areas were converted to cash crops such as cotton and rice in the 1970s. In 1975 many people were relocated under the government's 'villagisation' program, which meant that they had to leave their homes, their farms and, most significantly, their *ngitili*—their enclosures of acacia-miombo woodland.

2: Building support for forest landscape restoration

Convincing policymakers of the value of FLR is important not only for the success of restoration initiatives but also for continued support for forestry activities in general. Indeed, unless foresters can start to convince their own governments of the real value of forests and the need to restore degraded forest landscapes, then it is likely that forest department budgets will decline significantly.

Poverty reduction

Ironically, poor people rely more on natural resources, particularly degraded natural resources, than do other sectors of the population, even though they are often denied formal permission to utilise such resources. Experience has shown that once poor people are given long-term secure rights over degraded forest resources and supported with good technical advice they can turn such resources into healthy, productive and biologically rich assets within a few years. An economist might question whether this is enough by itself to lift poor people out of poverty. It seldom is, but it does constitute an effective and efficient first step, particularly in rural areas—where up to 75% of very poor people live.

Local economic growth

Economic planners and treasury officials spend a good deal of time considering how to make macroeconomic conditions more conducive to stimulating economic growth. At first appearance such concerns may seem completely unrelated to forest conservation and FLR and it is true that the forest sector (especially where forests are degraded) can never be expected to make the same contribution to national economies as many other sectors. However, the forest sector still has a role to play, particularly in stimulating local economic growth in places that have not, or will not, benefit from the trickle-down effects of globalisation and national-level growth.

The benefits of national economic growth are seldom distributed evenly across all sections of society. In general, countries experiencing high economic growth are also seeing a widening in the gap between the rich and poor. What can be done to stimulate economic growth in poor rural areas? Part of the answer is to permit people to invest in, use and enhance the productivity of degraded and secondary forest resources.

Environmental security

The links between FLR and environmental security are relatively straightforward. Loss of forest functionality in degraded landscapes has both *in situ* and downstream impacts. For example, as forest land is degraded and fragmented, the velocity and rate of site-level run-off increases, soil erosion accelerates, slope stability reduces, siltation loads increase and water quality declines. The disasters that grab headlines are therefore not just a consequence of, for example, one particularly heavy rainfall but are symptomatic of a long-term erosion of ecological integrity. FLR can help reverse this trend by increasing not only landscape-level resilience to shocks but also by enhancing landscape-level adaptability so that both government and local communities are better able to respond to such shocks.

Gone: in the mid-1980s it was estimated that the Shinyanga region of Tanzania had only 1000 hectares of *ngitili*. At that time the landscape was typically barren and degraded, with few if any forest resources. *Photo: © Stewart Maginnis*

Back: the 17-year-old Mwendakulima *ngitili*. These villagers used an FLR approach to restore 105 hectares of productive woodland, mainly by excluding cattle from the area and introducing silvicultural treatments. *Photo: © Stewart Maginnis*

The Sukuma have long relied on *ngitili* to provide them with dry-season fodder for their cattle, firewood and other essential products. But by 1985, a mere 1000 hectares of *ngitili* remained across the entire region. Previous government land rehabilitation initiatives relied mostly on exotic species and largely failed, so in 1985 government foresters started to consult with the local people as to what sort of strategy might be more likely to succeed. The response they received was almost unanimous—the restoration of the old system of *ngitili* should be a priority.

The first task of the new program (HASHI) was to raise awareness about the importance of restoring forest resources within a degraded landscape context. Farmers and communities were helped to select the most promising sites for their *ngitili* and advised on how to manage them. Besides advising individual farmers, HASHI also worked closely with the *dagashida*, the traditional community assemblies that lay down and enforce customary by-laws. It wasn't long before the *ngitili* were transforming the lives of tens of thousands of people. In Mwendakulima village, for example, where animal fodder and forest product shortages were common, the villagers removed the grazing pressure from 105 hectares of severely degraded land in 1987 and the site was soon colonised through natural regeneration. Income from *ngitili* is now used regularly throughout the Shinyanga region to support basic social services such as the construction of primary schools and the employment of local village health workers. In some villages there is anecdotal evidence that water supply has also improved because of the *ngitili*.

The HASHI project recently sampled 172 out of the 800 villages in the Shinyanga region. They enumerated over 15 000 individual and communal *ngitili* covering around 70 000 hectares. When one considers that this pattern of woodland restoration has also occurred in the other 628 villages that were not surveyed it means that it is highly likely that over 350 000 hectares of once-degraded forest land have been restored in a period of less than 20 years (Barrow et al. 2002).

What makes forest landscape restoration different?

The concept of FLR is different from many other restoration-orientated technical responses for several reasons:

- it focuses restoration decisions on how best to restore **forest functionality** (that is, the goods, services and processes that forests deliver), rather than on simply maximising new forest cover;
- it encourages the practitioner to take site-based decisions within a **landscape context**, ensuring, at the very least, that such decisions do not reduce the quality or quantity of forest-related functions at a landscape level;
- it requires that **local needs** are addressed and balanced alongside national-level priorities and requirements for reforestation, thus making **local stakeholder involvement** in planning and management decisions an essential component;
- while promoting the need for site-level specialisation, it strongly discourages actions that would result in **human well-being** being traded off against ecological integrity at the landscape level, or vice versa. Such trade-offs are unsustainable and tend to be counterproductive in the medium to long term;
- it recognises that neither the solutions to complex land-use problems nor the outcomes of a particular course of action can be predicted accurately, especially as ecosystems and land-use patterns change over time. FLR is therefore built on **adaptive management** and requires that necessary provision is made for monitoring and learning; and
- given the complex challenge of restoration, FLR will normally require a package of tools.

Over the long term, FLR cannot be driven solely by good technical interventions but will require supportive local and national policy frameworks. In many situations it is likely that policy change will follow on from good innovative practice. Therefore, if FLR is to succeed, practitioners need to familiarise themselves with how other land-use policies impact the restoration and management of forests. They also need to convince both policymakers and local communities of the benefits of FLR—and to show that these will actually materialise.

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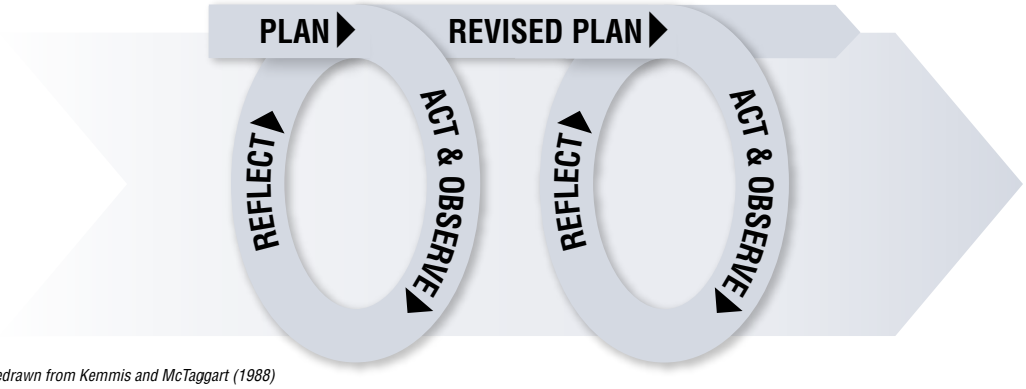
Adaptive management is one of the key elements of forest landscape restoration

by Don Gilmour

Moving forward

The action-learning spiral



Source: Redrawn from Kemmis and McTaggart (1988)

THIS ARTICLE proposes the adoption of an adaptive management approach to enable forest landscape restoration practitioners to respond to the dynamics found in natural and socioeconomic systems.

FLR initiatives typically have the following characteristics:

- multiple stakeholders with multiple interests (local, regional and national);
- complex ecological systems across a large landscape, with a variety of land-uses;
- the interface between large-scale natural systems and social systems; and
- a high level of uncertainty and many unknown factors.

Given the diversity of the FLR context, and the generally high level of uncertainty, FLR practitioners should employ what is called adaptive management; this is an approach to the management of complex systems based on incremental, experiential learning and decision-making, supported by ongoing monitoring of and feedback from the effects of decisions. The approach has elements of trial and error but it is much more than this, as it incorporates explicit learning as part of a process of building social capital among multiple stakeholders. This involves elements of:

- collaboration and learning;
- combining the learning and action that take place within a group of people (capturing both knowledge generation and the application of this knowledge in action); and
- knowledge-sharing among group members.

Adaptive management offers three important benefits:

- it can avert crises in conditions of uncertainty and surprise by increasing the societal capacity to 'roll with the punches';
- it offers a social steering instrument that can complement market, fiscal, regulatory and other measures to strengthen broad-based, multi-stakeholder engagement in the evolution of more sustainable relations between people and their environment; and
- it offers a way in which scientific-based technologies, alongside an understanding of people's perspectives, values and meanings, can contribute to collective learning and the motivation for action.

Context specific

Examples of the context of an FLR initiative

BIOPHYSICAL	Type, condition and location of forest patches
	Type and location of non-forest land
	Presence or absence of degrading influences
	Trends in forest condition—for example, increase or decrease in forest area
	Drainage pattern and slope characteristics
	Land-tenure patterns (legal and de facto)
	Geological and soil patterns
SOCIAL	Location of settlements
	Dependence of local people on forest resources for livelihood support
	Existence of local social institutions (including NGOs)
	Conflicts over land or resource use
	Stakeholder groups (inside and outside the landscape) that have an interest in the FLR initiative

Key components of adaptive management

It is convenient to think of adaptive management as a series of interrelated processes:

- **understanding the social and biophysical context** at multiple levels. This involves identifying stakeholders and dealing with multiple (and sometimes conflicting) interests;
- **negotiating objectives and outcomes** for different levels;
- **applying action-learning** (plan, act, observe and reflect) to facilitate the implementation process; and
- **monitoring and impact assessment**.

These processes should not be thought of as a series of sequential steps in which you complete one management task before moving on to the next. Rather, the processes should be thought of as interrelated and overlapping. For example, collecting and updating information to understand the context will be a process that continues throughout the life of an initiative. Likewise, monitoring and impact

1: The action-learning cycle

Step 1: plan

The action-learning cycle starts with planning to take action on some pre-defined issue or problem situation. Planning is built on the experience and ideas of all partners because learning is enhanced when it is derived from day-to-day work and experience.

Step 2: act

The results of the planning are put into practice, using timeframes agreed to in the planning sessions.

Step 3: observe and reflect

Those involved observe the results of the action and reflect on the impact. Reflections need to be carried out explicitly and are best done as a group, ideally facilitated by an outsider in the early stages. This reflection is very important because it enables the next steps in the cycle to benefit from the explicit learning that has resulted from the previous action.

Step 4: draw lessons

Lessons are drawn from the previous steps of action and reflection. The experiences to date are linked back to the concepts and ideas that were used in the initial planning. This leads to replanning for the next cycle, building on the learning of the various steps of action and reflection and drawing lessons from previous cycles. In this way, planning and action can proceed incrementally with everyone participating in and contributing to all facets of the process. Thus, there will be a strong sense of ownership over the outcomes (both successes and failures).

forest land primarily to improve timber production, while a conservation agency or NGO might want to improve habitat for wildlife or restore an endangered biotype. Hence, the primary objective of the group initiating the rehabilitation or restoration activity may create different responses from different stakeholders. It is only by identifying the interests of the various stakeholder groups that negotiations can occur, and the initial objectives may need to be modified to take account of the interests of other stakeholders. This process inevitably involves trade-offs and requires compromises in order to achieve outcomes that will be socially acceptable and sustainable over the long term.

Applying action-learning

The key idea behind action-learning is that a group of people with a shared issue or concern collaboratively, systematically and deliberately plan, implement and evaluate actions *(see Box 1)*. It is a process of learning through experience in order to act more effectively in a particular situation and is well-suited to situations with a great deal of uncertainty and risk.

assessment are not just one-off activities at the end of the initiative but ongoing practices that feed constantly into the action-learning cycle from the very beginning of the intervention.

Each of the four key components of adaptive management is now considered in turn.

Understanding the context

The context of an FLR initiative comprises the social and biophysical conditions in which it takes place and which could have an impact on it *(see table previous page)*. While it is never possible to understand everything about the context (particularly as it will change over time), it is important to know enough about it to make a start. An improved understanding of the context can be gained while the initiative continues.

Negotiating objectives and outcomes

The objective of an FLR initiative will vary depending on the agenda of the group promoting it. A forest department, for example, might want to restore an area of degraded

The process should be thought of as ongoing rather than a one-off event *(see figure previous page)*. The participants continually go through the cycle, with each iteration improved by the knowledge and learning obtained in the previous cycles.

Monitoring and impact assessment

An ongoing approach to monitoring and impact assessment is an essential aspect of adaptive management, because it enables stakeholders to build their social capital by sharing the learning that comes from such assessments. The next action-learning cycle of planning/acting/observing/reflecting is updated by realistic information, thus helping to maintain maximum adaptability and flexibility *(see the example in Box 2)*.

The adaptive management process should be thought of as a series of action-learning loops rather than a straight line from planning to the achievement of planned outcomes. Managers should feel free to adapt and modify the approach based on the knowledge that comes from the application of action-learning throughout the process.

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2: Monitoring for action-learning—case-study from Nepal

An attempt to rehabilitate the degraded hillsides of common land in a region of eastern Nepal was eagerly accepted by local people, as evidenced by discussions at village meetings. However, after the first year of planting it was noted that most of the planted trees had not survived. Discussions with a wide range of local people outside a formal meeting setting revealed that a group of poorer people (who were not sufficiently empowered to speak at village meetings) disagreed with the rehabilitation proposal. Their livelihoods were largely dependent on managing herds of grazing animals and they did not wish to lose their grazing land. The low survival rate of the planted trees was due to the graziers having allowed their animals to graze the recently-planted hillsides. Their more wealthy and powerful neighbours were primarily sedentary agriculturalists and did not need much open grazing land. This finding enabled the original approach to be modified so that the economic needs of the graziers were taken into account, resulting in greater success in the rehabilitation initiative.

The lessons from this example are that:

- ongoing monitoring enabled problems to be identified before they became too serious, so that the next action-learning cycle could be adjusted based on the learning obtained in the previous cycle;
- even with what seems like thorough planning, there are almost always unexpected outcomes and unintended consequences that need to be explicitly looked for and learnt from before continuing with the next action-learning cycle;
- great care needs to be taken to identify all the stakeholder groups that will have an interest in the outcomes of the rehabilitation or restoration activities; and
- consensus at village meetings does not necessarily mean agreement by all interest groups, particularly where there are large differences in power relations between different groups.

Who's interests does it serve?

Forest landscape restoration requires a stakeholder approach

by Trikurnianti Kusumanto

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THIS ARTICLE looks at how forest landscape restoration initiatives should use a stakeholder approach to identify, understand and address the interests and concerns of key stakeholder groups. This kind of approach is important in FLR for two reasons. First, the success of FLR initiatives will depend on the willingness of stakeholder groups to cooperate with each other and with the FLR efforts. Second, since stakeholders will affect and be affected by the FLR activities, they need to be involved in decisions regarding the goods, services and processes of the landscape that are to be restored. Thus, a stakeholder approach will help achieve the goal of equitable benefit-sharing among the key stakeholder groups.

Scenarios: women in Bolivia use scenarios as a tool for joint decision-making. *Photo: K. Evans*

Understanding the context of stakeholder processes

Despite the importance of stakeholder approaches to FLR, caution is required when using them. For example, it is not always possible to assign distinct identities to stakeholders, as they are often engaged in many overlapping roles and activities and these can change over time.

FLR practitioners also need to understand the context in which they will work with stakeholders and be aware of why stakeholder involvement is critical to their work. The importance of stakeholder involvement stems from various aspects of the natural resource management context, including the following points:

- natural resource management issues cut across social, economic and political spheres and involve many different stakeholder groups;
- natural resource management issues are often on a large scale (covering, for example, a watershed, province or nation). This means that some stakeholders may have to bear the costs (or enjoy the benefits) generated by the management actions of other stakeholders. For example, the excessive use of fertilisers by upstream farmers may pollute the soil cultivated by downstream villagers; and
- use rights over resources can be unclear, conflictive or open to common-property resource problems. In such situations stakeholders may compete with each other for the available resources.

Identifying the key stakeholders

A stakeholder, as defined here, is an individual, group of people or organisation that can directly or indirectly affect the FLR initiative or be directly or indirectly affected by it. Key stakeholders need to be identified early on in an FLR initiative, as the information revealed may influence the activities and results of the restoration work. This identification will then need to be revised, reviewed and revisited at later points throughout the FLR initiative; stakeholders initially identified as key may later become less relevant and new groups may become apparent only during later stages of the restoration. For this reason, stakeholder identification and verification should be viewed as a continual and ongoing process that is undertaken alongside the actual fieldwork.

Understanding stakeholder interests and interactions

Having identified the relevant stakeholders for the FLR initiative, practitioners then need to learn about the interests of, and interactions between, the different stakeholders. Some information on this will probably have been gathered

Conflicts and trade-offs

A *conflict* is a situation of disagreement between two or more different stakeholders or stakeholder groups. In some cases there may also be internal conflicts within stakeholder groups. Conflicts are normal wherever human beings interact and do not always involve violence. Conflicts can be managed constructively.

A *trade-off* is a situation where a balance needs to be reached when choosing between two desirable but incompatible objectives or outcomes. Trade-off situations are the rule rather than the exception in natural resource management. The successful implementation of FLR requires that trade-offs are made explicit and joint solutions sought.

Who does what

The 4Rs framework: stakeholders' rights, responsibilities, returns and relationships linked to forest land and resources: an example from Jambi, Sumatra (Indonesia)

STAKEHOLDERS	RIGHTS	RESPONSIBILITIES	RETURNS	RELATIONSHIPS
Nomadic group *(Orang Rimba)*	Customary rights (for which official recognition should be sought) Limited formal rights, particularly because the group has no administrative 'home'	Traditional management and protection of natural resources No formal, legal responsibilities related to natural resources	Non-timber forest products (NTFPs), crops and other forest goods; environmental services, homesteads; social security from patron-client relationship with some villagers	Customary rights over land and forest resources not recognised by the state Weak relationship with villagers Weak relationship with public bodies Patron-client relationship with some villagers
Original inhabitants	Customary rights (for which official recognition should be sought) Limited formal rights	Traditional management and protection of natural resources No formal, legal responsibilities related to natural resources Pay taxes	Timber and NTFPs, crops, income and other forest goods; environmental services; benefits from land (including grazing)	Customary rights over land and forest resources not recognised by the state Poor relationship with government because traditional shifting cultivation is officially not recognised and because customary land has been allocated to settlers Poor relationship with settlers because the latter were officially allowed to 'occupy' customary lands
Settlers	Formal rights over registered land-holdings under resettlement programs (rights of inheritance and land transaction)	Develop agricultural land-holdings under resettlement program No formal, legal responsibilities related to forest resources Respect customary authority of original inhabitants over land and tree resources Pay taxes	Annual crops from dry swiddens; crops and perennial products from registered land-holdings under resettlement program	Poor relationship with original inhabitants because of 'occupation' of customary lands Little commitment for resource management and protection other than on their own agricultural holdings
Sawmill owners, small-scale timber investors, middlemen, loggers	Illegal sawmill owners hold no official rights Official licence-holders hold official permits	No formal, legal responsibilities Pay levies in the case of licence-holders	Income from the sale of products, the services provided, or wage labour	Working and commercial relationships with original inhabitants and some settlers Poor relationship with government in the case of illegal sawmill owners Official relationship with government in the case of licence-holders
Government logging company	Logging rights	Community development Job creation Sustainable practices of natural resource management	Financial benefits Financial objectives met Income Homes for staff	Poor relationship with original inhabitants Official relationship with local government
District forestry agency	Rights to give permits regarding forest products (including timber) Rights to arrest illegal users Rights to propose resource management procedures	Implement government forestry policies, programs and management plans Arrest illegal users Control implementation of management plans	Policy and program objectives met Prestige (respect/fear) Recognition of authority Financial benefits	Limited relationship with original inhabitants, mostly during incidental monitoring visits
NGO implementing the integrated conservation and development project	Rights to develop and manage park and buffer-zone implementation plans No legal rights to forest	Develop and implement park and buffer-zone management plans Coordinate with national park agency for project implementation	Project objectives met Jobs	Relationship with original inhabitants and settlers limited to project activities Official relationship with local government

during the stakeholder identification process, which can serve as the basis for this investigation. The key objective of this stage is to ascertain how stakeholders see their current and potential role in resource management within the forest landscape.

Various tools are available for collecting this kind of information. Some of those used most commonly include various participatory rural appraisal techniques, focus-group discussion and semi-structured interview. These should be complemented by other methods, including direct observation of stakeholder actions and behaviours, to cross-check the information obtained.

When exploring stakeholder interactions, practitioners should look out for any situations of conflict or trade-off *(see box)*; understanding the conflicts between stakeholder groups is a necessary first step of any conflict management strategy. Similarly, understanding the trade-offs involved in choosing between mutually exclusive objectives will help practitioners to encourage stakeholders to see the value of FLR and to better manage the process.

Once the information on stakeholder interactions has been collected, it needs to be organised in a way that facilitates further analysis and discussion. One useful tool for doing this is the '4Rs framework', which sets out stakeholder rights, responsibilities, returns and relationships (see Dubois 1998). The *table* (previous page) presents an example of such a framework from Indonesia, where this tool was used in preparation for an action-learning process involving different stakeholder groups within the context of an adaptive, collaborative forest management project. It made explicit several imbalances in stakeholder roles and responsibilities. For example, those with most stake in the forest (that is, the original inhabitants) had limited legal responsibilities related to forest management. On the other hand, while the government had the responsibility to manage and protect the forest, they lacked the means to do so effectively. In principle, responsibilities (and therefore rights) should be transferred to those who have more stake in the forest and arrangements created for effective relationships between stakeholders. The role of an FLR practitioner is to assist stakeholders in negotiating a more balanced set of 4Rs.

This stage of an FLR initiative requires a considerable level of communication between FLR field staff and a variety of stakeholder groups in order to gather the necessary information. These interactions with stakeholders should be used as an opportunity to build trust with local groups and this is also an appropriate point at which field staff can begin to systematically encourage communication and collaboration between the different stakeholders.

Managing multi-stakeholder processes

As discussed in the article on page 7, FLR should be implemented using an adaptive management approach that involves an action-learning process whereby stakeholders collaboratively, systematically and deliberately plan, implement and evaluate the restoration activities. Through this process of learning the stakeholders build experience in order to act collaboratively as a group. The role of FLR field staff here is to manage this process by facilitating collaboration between stakeholders.

To enable practitioners to take on this facilitation role, FLR initiatives need to develop appropriate arrangements for the action-learning activities. These arrangements need not be set up especially for the FLR initiative; some may already exist, including community-wide meetings, encounters among neighbouring communities, or government consultation meetings involving local groups and other stakeholders.

Joint decision-making

Once these arrangements have been established, FLR practitioners can begin the actual facilitation work. Here we will look at an important aspect of the facilitation process: joint decision-making.

To properly facilitate joint decision-making, practitioners need to:

- focus on the core values of joint decision-making. These values are: a shared responsibility for the consequences of decisions; the inclusiveness of decisions; a mutual appreciation of one another's views; and active participation by all stakeholders. Joint decision-making means that the facilitator does not make the decision himself/herself but guides the process by which the different stakeholders collectively arrive at a decision;
- have the appropriate attitude. This implies that process facilitators should have a sense of fairness so that stakeholders consider the facilitated processes equitable, and they should also be empathetic and good listeners. Having the appropriate attitude is more important than any facilitation or learning tool; a facilitator's ability to adopt the right attitude can improve as they gain more experience with multi-stakeholder processes;
- provide the right conditions for stakeholders to learn new ways of joint decision-making. There are three important conditions here. First, stakeholders need to feel encouraged to propose new, creative ideas, even if they seem absurd; the more creative the group and the more alternative the decisions proposed, the more likely it is that an innovative decision will be taken. Second, stakeholders should be encouraged to take time to think and to reflect critically on their assumptions and old ways of thinking. Third, the facilitation should aim to build constructive relations between the stakeholders; and
- be equipped with effective tools to facilitate group processes. Effective facilitation tools are those that encourage joint learning and may include, for example, participatory mapping, focus group discussion, brainstorming, community meetings, scenarios, role-plays and computer-based simulation modelling.

Reference

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Life after logging

How to reconcile wildlife conservation and production forestry in Indonesian Borneo

by Douglas Sheil[1] and Erik Meijaard[2]

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BORNEO contains the richest and largest expanse of forest in Southeast Asia. It harbours exceptional biodiversity, including 6% of the world's flowering plant species, 6% of the world's bird species and 6% of the world's mammal species—all on less than 1% of the earth's land area. Safeguarding this natural wealth is a globally significant conservation task.

The Indonesian government has pledged to do its best to protect the nation's rich natural heritage, but achieving conservation goals remains an immense challenge. We know that biodiversity suffers whenever natural forest is cleared for other uses; on the other hand, selectively logged forests can provide valuable habitat for many species that would disappear if the forest was lost altogether.

Timber extraction inevitably affects forest flora and fauna, but operational practices can influence this in various ways. Understanding the nature of the impacts can help us devise forest management practices that are more 'wildlife friendly'.

Synergies: the tropical forest ecosystem supports an extraordinary range of interactions between different life forms. *Photo: © Gabriella Frederiksson*

We know that biodiversity suffers whenever natural forest is cleared for other uses; on the other hand, selectively logged forests can provide valuable habitat for many species that would disappear if the forest was lost altogether.

We recently conducted a comprehensive review of how vertebrate species of Borneo's lowland and hill dipterocarp forest are affected by logging and associated changes, and what might be done to minimise any negative impacts. We focused on the wildlife of Malinau District in Indonesia's East Kalimantan Province, the most forest-rich area remaining on Borneo[1].

The result of this review, undertaken with a range of local partners, government agencies and non-governmental organisations, was published recently in a multi-author book (Meijaard et al. 2005); it shows that forest management can be improved in many simple ways to allow both timber extraction and wildlife conservation.

Our sources included 280 publications and reports concerned with wildlife in Borneo, as well as a large body of regional and global literature. We consulted various local and international experts, several of whom became co-authors and contributors, examined various unpublished data sets, and gathered information from local people. Our main aim was to provide guidance that would help forest managers minimise the negative impacts of their logging operations on wildlife and maximise the role of production forests in wildlife conservation.

In this article we present some general results, give examples and make some specific recommendations for reducing logging impacts on wildlife.

[1]*The Malinau research site is the focus of an ITTO-supported project, PD12/97 Rev. 1 (F):* Forest, science and sustainability: the Bulungan Model Forest*, under which considerable research on the effects of logging on wildlife was conducted.*

Accommodating wildlife

Bornean species that would most benefit from more wildlife-friendly concession management

SPECIES (COMMON NAME)	MAIN THREAT	REMARKS
Sus barbatus (bearded pig)	Hunting and habitat fragmentation	Not threatened on Borneo but may be vulnerable to fragmentation. Migratory. Probably a major selective force in forest regeneration. The preferred food item of forest-interior people (except amongst Muslims)
Ursus malayanus (sun bear)	Habitat modification, hunting, disturbance and fragmentation	Listed as 'data deficient' and proposed as 'vulnerable' in the IUCN red list of threatened species (IUCN 2003); legally protected. Bear parts are traded as high-value items. Local people fear and kill them
Muntiacus atherodes (Bornean muntjac)	Habitat modification and hunting (especially in lowlands)	Not in the IUCN red list
Presbytis spp (leaf monkeys)	Logging-related hunting and targeted collection of bezoar stones	*P. hosei* and *P. frontata* listed as 'data deficient' in the IUCN red list
Tragulus spp (mouse-deer)	Habitat modification and hunting	Not listed in the IUCN red list; legally protected
Hylobates muelleri (Bornean gibbon)	Habitat modification and hunting	Listed as 'lower risk/near-threatened' in the IUCN red list; legally protected
Pongo pygmaeus (Bornean orangutan)	Hunting and pet trade	Listed as 'endangered' in the IUCN red list; legally protected
Cervus unicolor (sambar)	Hunting, although benefiting ecologically from habitat modification	Legally protected. Still common at distance from settlements and widely hunted in Malinau
Neofelis nebulosa (clouded leopard)	Little known; probably limited by prey availability; also targeted for hunting	Listed as 'vulnerable' in the IUCN red list; legally protected. Hunted for traditional ceremonial clothing
Most small carnivores (cats, mongooses and civets)	Probably fragmentation	*Cynogale bennettii* and *Catopuma badia* are listed as 'endangered' in the IUCN red list
Ratufa affinis (pale giant squirrel)	Habitat modification; hunting	Not in the IUCN red list
Sundasciurus hippurus (horse-tailed squirrel)	Habitat modification	Not in the IUCN red list
Rhinosciurus laticaudatus (shrew-faced ground squirrel)	Habitat modification	Not in the IUCN red list
Lariscus hosei (four-striped ground squirrel)	Habitat modification	Listed as 'vulnerable' in the IUCN red list
Lariscus insignis (three-striped ground squirrel)	Habitat modification	Not in the IUCN red list
All hornbill species	Habitat modification (nesting trees and fruit) and fragmentation; hunting for food, feathers and trophies	*Anthracoceros malayanus*, *Buceros rhinoceros* and *Rhinoplax vigil* are listed as 'lower risk/near-threatened' in the IUCN red list. Have strong cultural significance for local people. Feathers and skulls used in rituals
Most woodpecker species	Habitat modification	*Dinopium rafflesii* and *Meiglyptes tukki* are listed as 'lower risk/near-threatened' but do not seem to suffer much from logging. Others are not listed but are much affected by logging
Most trogons and broadbills	Habitat modification and fragmentation	4 trogons and 2 broadbills are listed as 'lower risk/near-threatened'
All pheasants	Hunting	Although pheasants are probably quite tolerant of the effects of habitat modification, they are much affected by hunting
Several owls, frogmouths and raptors	Especially interior forest specialists are likely to be affected by vegetation changes and disturbance, although most of the listed species probably also hunt outside forests	Many of these species are protected and in the IUCN red list
Gracula religiosa (hill myna)	Affected by trapping	Not in the IUCN red list, not protected
Irena puella (Asian fairy bluebird)	Ecological effects of habitat modification and fragmentation	Not in the IUCN red list
Several *Malacopteron* babblers	Habitat modification	Logging-intolerant species are not in the IUCN red list
Alcedo euryzona (blue-banded kingfisher) and *Lacedo pulchella* (banded kingfisher)	Both affected by habitat modification and fragmentation	Not in the IUCN red list but both species legally protected
Pigeons	Especially frugivore specialists are sensitive to the ecological effects of habitat modification; many pigeons are hunted	*Treron fulvicollis* is listed as 'lower risk/near-threatened' in the IUCN red list; *Ducula pickeringii* and *T. capellei* are listed as 'vulnerable'
All crocodiles	Hunted and collected	Not protected in Indonesia. Almost extinct in Malinau
All turtles/terrapins/tortoises	Hunted and collected	Most are listed as 'critically endangered', 'endangered' or 'vulnerable' in the IUCN red list; none is protected in Indonesia
Certain fish species, such as *Tor tambra*, *T. tambroides* and *Pangasius* spp	Ecological effects of habitat modification; overfishing. Need clean water and silt-free stream bed	Not in the IUCN red list. High-value and highly sought-after by local people. *Tor* species eat fruit and algae and are not found in logged forest or deforested land

Logging impacts

Habitat modification

Logging modifies forest habitat, at least in the short term. For example, various microclimatic changes occur in a forest that has been subjected to timber harvesting. These factors are important for species such as ground-dwelling amphibians and agamid lizards that require humid conditions.

Structural changes can affect perching, foraging, nesting, breeding or resting. We know that gibbons are obligate

Keystone: bearded pigs are important seed predators and ecosystem engineers in Bornean forests and a major source of animal fats and protein for indigenous communities. *Photo: © Kimabajo*

canopy-dwellers that require intact canopy structure. Some squirrels (eg *Ratufa* spp) prefer upper canopy, binturong (*Arctictis binturong*) are reluctant to travel on the ground and hornbills rely on branches for insect foraging.

Certain species, such as small rodents, benefit from the denser, more complex understorey conditions that can follow logging, while others—such as frogmouths (*Batrachostomus* spp) and forest owls like *Otus rufescens*—seem to require the orderly and open structure of primary forests. Some, like forest bats (*Hipposideros* spp and *Rhinolophus* spp), are poorly adapted to finding food in open forest.

Larger-stemmed trees provide wildlife with hollows for nesting and food storage. Practices that remove trees with cavities, as well as dead standing trees, may be one reason why hole-nesting birds suffer from logging. Certain hollow-using civets and squirrels, especially species like *Ratufa affinis*, may also suffer from the disappearance of hollow trees after logging.

Rotting tree stumps are used by species such as squirrels, sun bear (*Ursus malayanus*), trogons, forest kingfishers and forest bee-eaters. Rocky outcrops provide nesting and roosting spaces for a variety of species, including reptiles, birds (raptors, swifts) and small mammals, and provide refuge against predators; such sites are often damaged during the collection of material for road-building. Liana-cutting can lead to reduced fruit abundance.

Certain species, such as small rodents, benefit from the denser, more complex understorey conditions that can follow logging, while others … seem to require the orderly and open structure of primary forests.

We found no evidence of any vertebrates having a specific dependency on dipterocarps or other targeted commercial timber species such as *Agathis*. Nonetheless, mast fruiting episodes (in which a population of trees produce fruit simultaneously) involving dipterocarps may be critical for the long-term breeding success of several species. Large dipterocarp trees (especially those with cavities) also serve as important nesting sites.

The low vertebrate abundances found in areas like Malinau can be attributed not only to hunting but also to the naturally low abundance of fruits and palatable foliage, and to mineral deficiencies in the soils. Such poor resources suggest the critical importance of fruiting trees and sources of minerals ('salt springs', 'salt earths' and sites with clays that are eaten by animals).

Apart from modifying habitat, logging may also lead to an increased risk of fire, the invasion of weedy and exotic species, damaged soils and increased sediment loads in rivers. Two other potential effects are particularly important: hunting and habitat fragmentation.

Hunting

Increased accessibility and the provisioning needs of logging camps often escalate hunting. Camp staff themselves often set traps, trade in cage birds, and fish using harmful techniques. Hunting is especially intense for species that are targeted for food or trade, such as ungulates, primates, pangolin, terrapins, crocodiles and specific bird species such as hornbills, pheasants and the straw-headed bulbul (*Pycnonotus zeylanicus*).

Fragmentation

Fragmentation is a major concern, especially for species that occur at low densities and have large home ranges (eg carnivores and migrating species); divided populations are at much greater risk of local extinction. New forest edges can also have deleterious effects which might extend considerable distances into undisturbed forests. The effects of fragmentation are greatest in forests with excessive road density, wide clearings and many large deforested openings.

The character of sensitive species

By analysing results from numerous studies we identified factors typically associated with vulnerable vertebrates *(see box opposite)*. These were dietary specialisation, restricted feeding strata, endemicity, apparent evolutionary age, and absence from small islands. Terrestrial insectivores and frugivores (fruit-eaters) appear particularly sensitive, whereas herbivores and omnivores are more tolerant or even benefit from logging. Typically, the wider a species' ecological niche, the more tolerant it is of changes. We also identified the main threats posed by logging to specific wildlife *(see table previous page)*.

Reducing logging impacts

What can be done to mitigate the impacts of logging on wildlife? The results of our review show how the application of conservation planning and implementation, good road-building and reduced impact logging methods can benefit wildlife. The implications of some recommendations require further evaluation (for example, is it possible to maintain canopy connectivity across logging roads and still allow the road surface to dry? Perhaps yes in rocky areas), but most appear ready for implementation.

Will he make it? Red leaf monkeys (*Presbytis rubicunda*) require canopy connectivity for their arboreal lifestyles. *Photo: © Kimabajo*

Recommendations

It is important to retain contiguous forest as far as possible. Reducing the width of roads and tracks, and limiting felling-gap sizes, should reduce the effects of fragmentation on arboreal species.

We recommend the regulation of hunting in timber concessions. Ideally, the hunting of IUCN-listed and locally vulnerable species should be eliminated.

Various types of ecologically important habitat structures (such as large trees, hollow trees and old fruit gardens) and locations (pools, wallows, salt-licks, and river-side habitats offering nesting opportunities for reptiles and amphibians) should be identified and maintained where possible.

Plant species and genera that are important habitat components (some of which are listed in Meijaard et al. 2005) should be retained. Protecting the mid-canopy by minimising incidental tree damage is a good strategy for conserving a whole host of palms and fruiting shrubs. We strongly recommend that understorey slashing (currently a legal requirement) be discontinued.

Conclusions

Researchers usually emphasise what is unknown over what is known. Indeed, our review shows that in many respects Bornean wildlife remains poorly understood. Nonetheless, we have sufficient knowledge to identify a number of practices that, if applied in logging operations, would be beneficial for wildlife conservation in Borneo. While research will continue to contribute to our understanding, a lack of knowledge now cannot justify delay in implementing these practices whenever the opportunity arises.

We believe that reviews like ours are essential if we are to begin addressing the complex realities of conserving tropical biodiversity without constraining development options. Production forests can serve as a useful component in a large-scale conservation strategy, not as a replacement for strictly protected areas but as a valuable addition. Improving current management practices requires pragmatic collaboration between ecologists and forest managers. Our multi-stakeholder review and synthesis is one contribution to such collaboration.

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Protecting the mid-canopy by minimising incidental tree damage is a good strategy for conserving a whole host of palms and fruiting shrubs.

The book can be downloaded as a 2.6 MB pdf file at: www.cifor.cgiar.org/scripts/newscripts/publications/detail.asp?pid=1663. To request a hard copy of the book contact Nia Sabarniati at n.sabarniati@cgiar.org. While stocks last, copies are free for people from developing countries; others must pay postage.

Logging impacts on wildlife groups

Mammals

Various mammals are sensitive to timber extraction. These include: (a) those with specialised diets, like the Bornean gibbon (*Hylobates muelleri*); (b) species restricted to particular vegetation strata (eg ground level, high canopy), such as the terrestrial Malay civet (*Viverra tangalunga*); and (c) species endemic to Borneo, like the Bornean yellow muntjac (*Muntiacus atherodes*).

Birds

Specialist insectivorous birds of the understorey like the inconspicuous striped wren babbler (*Kenopia striata*) are rarely seen in logged forest, probably because of reduced food. Birds sought by hunters, such as the culturally important hornbills, suffer indirectly from logging when hunting pressures increase. Some, like the helmeted hornbill (*Rhinoplax vigil*), are further impacted because they only nest in large dipterocarps, which are often felled in timber operations.

Amphibians

Logging can, at least initially, increase the species-richness of frogs. This happens because logging creates ecological niches that are normally not found in unlogged forests; these, in turn, attract species like the spotted stream frog (*Rana signata*), a species generally encountered in more open forest areas. It is unclear how the increased competition from these new species might affect forest specialists.

Reptiles

Little is known about the direct ecological effects of timber extraction on reptiles; most species occur at low densities. Certain species (such as terrapins) suffer because they are sought-after for trade. Species that live within the leaf litter are locally impacted, but more data are needed.

Fish

The fish that suffer most from logging occur in fast-flowing streams and rivers. Species like the Borneo-endemic hillstream loaches (*Gastromyzon* spp, *Neogastromyzon* spp, *Homaloptera stephensoni*) and stone-lapping minnows (*Garra borneensis*) require silt-free surfaces and clear water. They decline sharply after logging, although most populations recover rapidly as long as the forested stream environment is maintained. A few species (eg carps like *Tor* spp and *Pangasius* spp) appear more vulnerable: *Tor* eat fruit from riverside forest and algae that grow on silt-free surfaces, have slow reproductive rates and range widely, while *Pangasius* aggregate in a predictable manner, making them vulnerable to over-exploitation, while their breeding sites are also susceptible to damage by logging.

Iwokrama's plan for SFM

A sustainable forest management model has been devised in Guyana. Now it needs to be implemented

by
Olav Bakken Jensen

Ministry of Environment
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IN 1989 the Government of Guyana designated 370 000 hectares of near-pristine rainforest in the southern part of the country as the Iwokrama Forest. This area is characterised by poor quartzite sandy soils of the ancient Guyana granite shield. Undulating hills are interspersed by rocky outcrops and mountains, transected by several major and partly navigable rivers. The northern part of the forest is uninhabited, save for one indigenous village, but to the south a dozen or more indigenous communities comprise some 3500 inhabitants.

In this area, the Government of Guyana initiated a very ambitious plan to combine research and practical forest management with the aim of showcasing both conservation and sustainable forest management (SFM) for timber production. A field station was constructed in 1994, and in 1996 the government passed the Iwokrama Act, which set out the legal parameters of the forest and the activities to be undertaken therein. It also established the Iwokrama International Centre for Rain Forest Conservation and Development, a non-profit organisation charged with managing the Iwokrama Forest. Another very important aspect of the Iwokrama Act was that the indigenous communities inside and around the forest retained their traditional user rights, including to wildlife and even the small-scale mining of gold.

River views: the Iwokrama International Centre for Rain Forest Conservation and Development. *Photo: © Fotonatura*

Right from the start the initiative attracted international donors. ITTO became an important one of these with the acceptance and financing of ITTO PROJECT PD 10/97 REV. 1 (F) in 1997. The development objective of this project was to optimise the sustainable supply of economic and environmental goods and services from Guyana's forests; the specific objective was to develop a demonstration model of sustainable, commercial-scale forest management to deliver multiple products.

Probably the most remarkable achievement of Iwokrama ... has been its impact on local indigenous communities.

The forest was zoned (see *TFU* 11/4) into two major categories of roughly equal size: wilderness (in three separate areas), and sustainable use (one area). The ITTO project was to concentrate on the 180 000 hectares zoned for sustainable use, with six planned outputs: a forest management plan; a feasibility study for both timber and non-timber forest products (NTFPs); commercial arrangements for utilisation; increased availability of timber and NTFPs; the training of local men and women in SFM for multiple products; and improved guidelines for SFM.

The project ended in April 2004 and an ex-post evaluation was carried out by the author in April 2005; it revealed that the project had reached many of its planned outputs, and even surpassed expectations in some of them.

Effects on indigenous communities

Probably the most remarkable achievement of Iwokrama, through the ITTO project and others, has been its impact on local indigenous communities. Initially, these communities viewed the Iwokrama initiative with a certain measure of suspicion, which had its roots in earlier indigenous land claims to the forest. However, the nature of the Iwokrama Act, which respects indigenous user rights, the broad consultative process used to develop joint activities, and the participatory training provided by Iwokrama, have all contributed to the building of a very harmonious relationship between the communities and the Iwokrama initiative. Testimonies to this relationship were given again and again by indigenous representatives during the ex-post evaluation.

Local organisation

One of the most interesting and positive outcomes of the relationship-building was that the indigenous communities organised themselves into a joint body—the Northern Rupununi District Development Council (NRDDB)—to speak with one voice on matters concerning Iwokrama. In cooperation with Iwokrama, the NRDDB itself has launched a series of training activities on a wide range of topics, including improved agricultural practices, fisheries' conservation and management, the production of a range of NTFPs, teacher-training in vernacular languages, and research activities in both native languages and culture; it now even runs a local radio station and publishes a newsletter. In fact, the coming of Iwokrama has raised the organisation of the indigenous peoples in the region to an entirely new level.

Management planning

In many other fields, the achievements have been significant. Forest inventories were carried out in several stages, partly based on data and assumptions from other parts of Guyana. During the extension of the project, a new, state-of-the-art inventory of the entire sustainable-use area was carried out, and a final management plan and feasibility study for the production of NTFPs and timber was developed.

This management plan represents a departure from the selective logging practised elsewhere in Guyana to date, particularly because it identifies a range of new commercial species. Partly due to this it also specifies a reasonably high annual allowable cut, which has been shown to be well below sustained-yield capacity but should be high enough to ensure the economic sustainability of the operation.

Other forest research carried out as part of the Iwokrama initiative, mainly financed by other donors, has almost been overdone. The Iwokrama bibliography of publications covers some 150 titles, some into topics—such as hieroglyphs, herpetology and arachnology—that seem rather esoteric for practical forest management. Indeed, for snake- and spider-lovers, Iwokrama has a lot to offer!

Time to implement

The supporting materials for SFM are certainly impressive, but after nearly ten years of development it would seem high time for the concepts to be put into practice. Implementing the management plan is essential for making the Centre economically sustainable through the production of timber and NTFPs and also for generating benefits for the indigenous communities. The ex-post evaluation revealed that the preconditions for logging and commercial operations are in place. Perhaps the biggest shortcoming of the ITTO project and of the Iwokrama initiative generally, then, is that logging has not actually started yet. Iwokrama Timber Inc has been created to deal with prospective logging companies and also to work with the indigenous communities to agree on the split of proceeds from harvesting, but this work is still nascent. It would seem that further impetus is needed to get full-scale commercial activities under way; this will be provided by a follow-up project, ITTO PROJECT PD 297/04 (F), should it be approved and financed by the International Tropical Timber Council.

Suspended animation: the author poses on a canopy walkway in the Iwokrama Forest.

There is little doubt that all the preparatory work, and particularly the development of the management plan, is a major achievement for the ITTO project, and something that in the view of this author will have a lasting effect on forest practices and policy, not only in Guyana but also elsewhere in South America and possibly beyond. But the proof of the pudding lies in the eating. It is therefore of the utmost importance that the next phase of the project gets under way as soon as possible, and the management plan is put into practice.

Living space: an Amerindian hut in the Iwokrama Forest.
Photo: © Fotonatura

How to hurdle the barriers

Tropical timber exporters must overcome an increasing array of technical barriers to trade

by Russell Taylor[1], Ivan Tomaselli[2] and Lew Wing Hing[3]

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Stacked: plywood sheets in Sarawak, Malaysia, stacked for curing and inspection prior to export. *Photo: courtesy Samling Corp*

ITTO PRODUCER member countries have expressed concerns that evolving product standards and technical regulations in consumer markets are restricting the expansion and diversification of the international tropical timber trade. To assess these concerns, ITTO commissioned a study from the authors to identify and assess product standards, quality grading rules, building codes and other regulations in various markets that affect the trade of wood products and in particular tropical timber.

We used several avenues to collect information. These included a structured questionnaire to tropical timber producers, visits to government agencies and industry associations in both producer and consumer regions, telephone interviews, and a review of publicly available information. The resulting report identifies the gaps between the markets' technical requirements and the ability of tropical timber-producing countries to comply, and proposes ways to address these gaps.

This article provides an overview of the findings of the study; the key terms used—trade barrier, non-tariff barrier and technical barrier to trade (TBT)—are defined in the *box*.

Definitions of trade barriers

Trade barrier: a trade barrier is usually a trade policy or action put in place by a national government that interferes with the free-market buying and selling of goods and services internationally. Trade barriers can be in the form of tariffs and non-tariff barriers.

Non-tariff barrier: non-tariff barriers include laws, regulations, policies and practices that either protect domestically produced goods from the full brunt of foreign competition, or artificially stimulate the exports of domestic products. The figure (page 19) gives some examples of non-tariff barriers affecting tropical wood products.

Technical barrier to trade (TBT): through trade agreements between countries, governments set out procedures for ensuring that technical regulations and standards do not create 'unnecessary obstacles to international trade'. However, in establishing technical requirements to protect the health and safety of domestic consumers and to establish product-quality conformity among producers, there exists the potential to create barriers to market access. Requirements that have the potential to be TBTs include product standards, product quality and grading requirements, building codes and other technical regulations.

Situation in major consumer countries

In North America, grade stamp certification is required for any lumber or panel product that is to be used in structural applications. Obtaining third-party accreditation for lumber or panel grade stamps tends to be a costly and onerous process, which may be why very little structural material is made from tropical species.

Canadian and US plant health inspection agencies require all wood packaging and crating material to be heat-treated or kiln-dried according to the Food and Agriculture Organization of the United Nations' International Standards for Phytosanitary Measures (ISPM 15).

In the European Union (EU), the most significant TBTs are related to panel products, particularly those intended for construction applications. As of April 2004, structural wood panels sold within the EU must be certified to carry the European Conformity (*Conformite Europeene*—CE) marking.

Relative to the impact of CE marking, European formaldehyde emission requirements for wood panels are seen as less of a TBT by many timber exporters. Nevertheless, the issue should be monitored; for example, the EU Construction Products Directive is expected to include further limits on formaldehyde emissions in future updates of its harmonised European Committee for Standardization (Comité Européen de Normalisation—CEN) standards.

Ecolabelling

Another, possibly more pressing TBT affecting tropical wood products in the EU, North America and some other markets is government procurement. Increasingly, federal, state and municipal governments are specifying that all their purchases of building materials, furniture and millwork derived from tropical timber should be harvested legally and originate from sustainably managed forests. Although usually not specifically required, some government contracts make direct reference to wood certified by the Forest Stewardship Council (FSC) or 'equivalent certification body'.

Given the rising market requirement for FSC-or-equivalent certification, it is evident that ecolabelling and chain-of-custody documentation could become a serious impediment to the timber trade—and to the tropical timber trade in particular. The recommendation of this study is that producers and importers of tropical timber work together to

foster dialogue with EU and US governing bodies to explain what is being done to improve forest management and to convey the economic and social impact that ecolabelling and chain-of-custody requirements will have in many developing countries.

North Asia

In Japan, the most significant TBTs for tropical timber products are the Japan Agricultural Standard (JAS) and the Japan Industrial Standard (JIS) for formaldehyde emissions pertaining to 'sick-house syndrome'. Products affected are plywood, particleboard, medium-density fibreboard, structural panels, overlaid panel products, flooring and stair treads. Each product category requires separate certification in accordance with the relevant standard.

At present, neither Korea nor China has TBTs that are significant enough to have any impact on trade.

Situation in major producer countries

Latin America

There is significant variability between the major producer countries of Latin America in the extent to which the industry has been affected by building codes, standards and other factors related to market access, and also the extent to which countries have the capacity to overcome the constraints.

Brazil's timber industry points to several TBTs and other market requirements that it considers to be restraining market access. These include the EU's CE marking, US standards for structural wood panels, phytosanitary standards in major consuming markets (including ISPM 15), US-government homeland security measures, formaldehyde emissions' control, and environment-related issues (including government procurement procedures).

However, the capacity of Brazil to meet the demands of TBTs and other market requirements is higher than in most other Latin American countries. The country has a more structured framework for standards, quality certification, accreditation and testing laboratories, and it also possesses a significant number of large companies that are capable of absorbing costs related to TBTs.

Photo: courtesy Samling Corp

Bolivian producers have reportedly been little affected by building codes, standards and other market requirements. The only case mentioned by the timber industry when surveyed in the course of this study was related to formaldehyde emissions in wood panels and furniture components. The most important factor affecting the Bolivian forestry sector are phytosanitary requirements related to non-wood forest products.

Technical hitches

Flow-chart of non-tariff trade barriers affecting tropical timber

TRADE BARRIERS

TARIFF BARRIERS

NON-TARIFF BARRIERS

REQUIREMENTS/TECHNICAL BARRIERS

- PRODUCT STANDARDS
  - *packaging*
  - *formaldehyde emission (eg JAS)*
  - *chemicals*
- TECHNICAL/GRADING REQUIREMENTS
- PHYTOSANITARY REQUISITES
- BUILDING CODES
  - *fire codes*
  - *wind resistance*
  - *strength characteristics*
- QUALITY CERTIFICATION/TEST REQUIREMENTS
  - *CE marking*
  - *TECO/APA*

IMPEDIMENTS/OTHER TECHNICAL BARRIERS

- SPECIFIC LIMITATIONS
  - *quantitatives*
  - *bans*
  - *boycotts*
  - *licenses*
  - *quotas*
  - *tariff escalation*
- TIMBER CERTIFICATION
  - *CITES*
  - *FLEGT*
  - *FSC*
- DIVERSITY OF STANDARDS
- ENVIRONMENTAL ISSUES
- HOMELAND SECURITY MEASURES

On the other hand, the Bolivian timber industry has received some signs from importers that market requirements will tighten in the next few years. This is a source of concern for the industry, as it will add new costs and further reduce the competitiveness of its products in international markets. The country has a very small capacity to deal with the issue: the forestry sector is largely based on small and medium-sized enterprises (SMEs) that will not be able to absorb the costs related to certain TBTs and market requirements such as CE marking for panels.

The Ecuadorian timber industry has been affected mainly by regulations related to wood-panel formaldehyde emissions in Japan. The perception is that standards are too high and the costs involved in testing/certification make exports to Japan almost impossible. The industry is also concerned about requirements related to security and procurement procedures imposed by government agencies in the US, and it feels that while TBTs and other market requirements are growing, the capacity to overcome them is limited—particularly among SMEs, which comprise the majority of the industry.

Africa

The timber industry in Cameroon has, so far, not been affected by TBTs and other market requirements. This is most probably due to the fact that around 90% of exports comprise sawnwood and (to a lesser extent) logs.

The main concern of the Ghanaian timber industry in relation to TBTs and other related market requirements is CE marking, which is reportedly affecting exports to Europe. Ghanaian companies have difficulty meeting the new technical demands due to the general lack of adequate machinery and also because it does not have in place quality-assurance and certification programs.

The Ghanaian timber industry is also concerned about formaldehyde emissions' requirements and, in general, about growing market requirements on a range of technical, environmental and social issues. Nevertheless, Ghana is one of the most progressive countries in Africa in terms of standards' development and product-testing facilities. The main problem, though, is with the SMEs, which are unlikely to possess the means to absorb the extra costs of overcoming such TBTs.

The general perception of Gabon's tropical timber industry is that TBTs and related market requirements are not a major problem. This is largely attributable to the fact that around 80% of the country's timber exports are in log form.

Southeast Asia

The three TBT issues that most concern the timber sectors in Malaysia and Indonesia are CE marking for structural plywood, the British Standards for structural plywood, and the JAS/JIS for formaldehyde emissions. Although there is an added cost in meeting such market certification requirements, Malaysia has devised an industry solution to address these technical requirements and Indonesia is not far behind. In common with the situation in the other regions, SMEs in both countries are finding it difficult to cope with the demands imposed upon them by the TBTs.

Doha Development Agenda

The World Trade Organization's Doha Development Agenda was set at its 4th Ministerial Conference in Doha, Qatar, in November 2001; it includes issues related to TBTs that affect the tropical timber industry and trade. Discussions on the agenda are broad in scope and still in their early stages. Nevertheless, it is important that tropical timber-producing countries and the industry follow the development of the agenda closely. Particular attention should be paid to discussions related to multilateral environmental agreements and government procurement policies and the implications of these for the international trade of tropical timber products.

Recommendations

Producer countries

We make three recommendations to this group. First, producer governments should pursue greater regional cooperation to help overcome knowledge gaps related to TBTs within and between countries.

Second, governments should establish a solid framework for developing local standards for timber products, certification systems and bodies and laboratory facilities with the aim of overcoming international market barriers and meeting requirements. Governments could, if necessary, seek international support for such development. Likewise, they could evaluate the possibility of also taking this action at a regional level, since this would help efforts to harmonise standards.

Third, governments should cooperate in efforts to avoid the escalation of TBTs and to promote the harmonisation of standards, building codes and other requirements among consumer countries. They should continue to raise the issue of TBTs at international fora such as ITTO and, in particular, they should make efforts to resume discussions on the issue under the Doha Development Agenda.

Major consumer countries

Major consumer countries should address three main issues. First, mechanisms need to be developed and/or improved to ensure that third-party certification does not become a major TBT. For example, governments in importing countries could simplify procedures, taking into consideration existing mutual recognition mechanisms such as the International Accreditation Forum. Another action would be to cooperate with producer countries to develop local skills through technical assistance programs, technology transfer and other activities that would aim to reduce costs associated with complying with market requirements.

Second, consumer governments should endeavour to ensure that procurement policies at all levels of government (federal, state and municipal) do not become a market barrier for tropical timber products.

Third, consumer governments should provide technical and financial assistance to standards' and other organisations in producer countries to put in place effective and efficient national quality assurance programs for product certification in line with market requirements. They could also provide direct technical assistance to the private sectors of producer countries with the aim of enhancing the capacity of the industry to achieve the standards, quality levels and other requirements needed to access markets.

ITTO

ITTO has a critical role to play in enhancing market access. This includes helping producers to overcome their limitations in knowledge and infrastructure and serving as a forum for discussion between producers and consumers on the issue of TBTs.

ITTO should also make funds available to initiate specific programs for overcoming identified knowledge gaps among producers, such as through increased cooperation among members on technology transfer. And, on the infrastructure gap, ITTO should provide technical assistance to producer countries for putting in place a system of 'attestation of conformity' and testing facilities in line with market requirements.

Final comments

The recent spate of TBTs has had a significant negative effect on tropical timber exporters. Some TBTs, such as the EU's CE marking scheme, require the producer/exporter to make major structural changes in operation in order to continue doing business in that market. In most cases, such producers/exporters must also absorb significant additional costs in meeting the new requirements.

There exists a general and growing perception among industrialists and industry associations in producer countries that TBTs have affected many small enterprises and even some medium-sized ones, especially those with poor market intelligence. The inability of such enterprises to cope with new requirements will likely force many out of the markets in which significant TBTs have been imposed. This in turn could have a major impact on employment in the timber sectors of several producer countries.

The study makes a number of recommendations directed at producer and consumer countries and ITTO. The implementation of these should go a long way towards alleviating future disruptions arising from the enforcement of new TBTs in the international tropical timber trade.

For a copy of the study 'Measures to promote the expansion and diversification of international trade in tropical timber' contact Mr Amha bin Buang, ITTO Secretariat, eimi@itto.or.jp

ITTO reinforces commitment to forest law enforcement

The most recent Council session delivered more information on issues of forest law enforcement and illegal logging

ASSISTING COUNTRIES to develop and enforce forest laws remains one of the most important tasks facing the international community, according to Alhassan Attah, Chairman of International Tropical Timber Council.

The Council, ITTO's governing body, convened in Brazzaville, Republic of Congo last June in its 38th session to discuss issues such as forest law enforcement, forest restoration, and the achievement of sustainable forest management.

"The work carried out at this session highlights the need for ITTO to continue its efforts to assist countries in forest law enforcement," said Mr Attah.

The Council received a report from an ITTO diagnostic mission to Gabon, a country with a strong political commitment to sustainable forest management. Nevertheless, the mission found that increased support for forest law enforcement would be necessary during and after the coming into force of a new forest law this year. It recommended that ITTO support training programs that would address, among other things, adherence to the forest law and associated regulations.

The Council also heard the report of a mission to Liberia, where the formal forest sector was destroyed during a civil war. The United Nations has imposed an embargo on the export of timber from the country in an effort to limit the contribution of timber smuggling to civil unrest. The mission recommended that ITTO provide a wide range of support to the Liberian forestry sector as it is reconstructed.

During the session the Council received a progress report on the development of a code of best practices for improving law compliance in the forest sector, a joint initiative of ITTO and the Food and Agriculture Organization of the United Nations. When published later this year the code will provide countries with a compendium of experiences in combating illegal forest activities.

A feature of the Council session was a side-event organised by a coalition of local and international civil-society organisations. The event focused on the relationship between secure land tenure for indigenous and local communities and the task of reducing illegal logging.

For example, Mr Kapupu Diwa, a representative of indigenous people in the Democratic Republic of Congo, reminded delegates of the close relationship that indigenous people in his country have with the forest, but pointed out that their rights to the forest are not being respected and that they are not benefiting as they should from the commercial use of forest resources.

Andy White of Forest Trends, a US-based NGO, urged ITTO to do more to assist its members in tenure and policy reform.

"ITTO is uniquely placed to help," he said. "For example, it can encourage open dialogue within and between countries, conduct studies—not only on what to do but how to do it—and expand its technical assistance to countries."

According to Dr Manoel Sobral, ITTO's Executive Director, the increased commitment of countries to deal with illegal logging will help to significantly reduce the problem over the next few years.

"We are seeing many countries taking bold steps towards better forest law enforcement," he said. "Moreover, there is a growing commitment among developed countries to assist these efforts. For example, the Japanese government intends to take the lead in the elimination of illegal logging in cooperation with ITTO. I warmly welcome this commitment and expect that it will lead to significant tangible results in coming months and years."

ITTO grants US$7.6 million for tropical forests

Projects to promote the trade of certified timber in Guatemala, create a market for environmental services in China's tropical forests, and assist local communities to rehabilitate degraded forest land in Java, Indonesia, were among those funded by the International Tropical Timber Council at its 38th session in Brazzaville, Republic of Congo last June.

The Council financed a total of 13 projects and three pre-projects at this session, including one that will promote the development of small-to-medium-sized enterprises in Gabon, another that will produce a state-of-the-art publication on African timber species, and another that will assist Myanmar to conserve its teak genetic resources.

A project funded in the Republic of Congo will continue work to improve forest management, conserve biodiversity and enhance local livelihoods in the buffer zone of the Noubale-Ndoki National Park. Funds were also pledged to a Congolese project that, when fully funded, will use multi-spectral aerial digital photography to improve forest monitoring. In total, some US$1.35 million was pledged to assist the Republic's forest sector.

ITTO also decided to provide additional support to the Congo Basin Forest Partnership, committing US$150 000 for activities that will assist the implementation of the Sub-regional Convergence Plan and the COMIFAC 2015 Objective.

The major donors at this session were the governments of Japan, Switzerland, the Common Fund for Commodities and the US, while the governments of the Netherlands, Norway, France, Finland and the Republic of Korea also pledged funds. In addition, funds were mobilised from the Organization's unearmarked resources.

Descriptions of the newly funded projects will be published in the next edition of the TFU.

Analysing the imperfections of the sawnwood market in Colombia's South Pacific region

by Sandra Rodriguez

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EVEN THOUGH forest covers 50% or more of its land area, Colombia's forestry sector is not well developed and its contribution to the well-being of society is not high. Several reasons can be put forward to explain this; for example: many standing trees do not have a high market value; labour-intensive producers extract high-value woods which are commercialised in an informal market; landowners must become employees of sawmills before extracting timber from their own land; the traditional use of chainsaws to extract and square timber causes high levels of waste and promotes illegal extraction; employment does not promote skill development since timber is pulled by hand to the nearest creek, channel, river or road; salaries do not compensate labour; and loggers do not have an incentive to conserve the forest.

These problems can be overcome. The National Development Forestry Plan (Minambiente 2000) states that economic activities related to forest resources cannot be considered separately from the activities and dynamics of regional and international markets. In this sense, the sustainability of timber production processes should be addressed in the economic, social and political contexts in which production is taking place. One of the objectives of the National Plan is to boost forest products and services in the national and international markets by promoting competitive market links.

The objective of my masters' research was to estimate the degree and nature of imperfections in the sawnwood markets of the South Pacific region of Colombia—which produces 60% of the country's natural-forest sawnwood. This objective was achieved through a description of the structure of the timber market and an examination of the behaviour of the participants in this market. Describing the markets and the degree of imperfection of this region is a contribution to policymakers' efforts to evaluate the participation of the timber market in achieving national economic goals. It also gives a better understanding of the role of the timber market in the alleviation of poverty at the regional level.

Market description

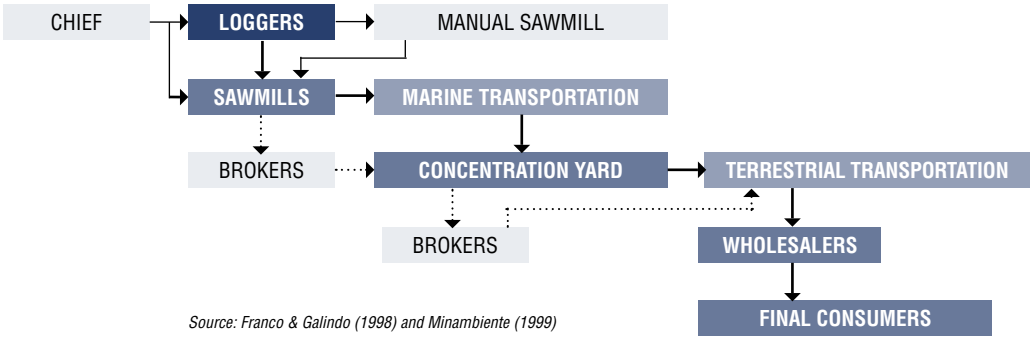
I analysed elements of market structure/conduct/performance for each market in the chain of commercialisation *(see figure)*, which was defined for the South Pacific region by Franco and Galindo (1998) using the Forestry Statistic Information System (SIEF). Four sawnwood markets can be delineated: 1) the market between wholesalers and final consumers (furniture and construction industries) located in Bogotá; 2) the market between concentration yards and wholesalers—concentration yards are located in the southern part of the country, west of the Pacific littoral (Buenaventura); 3) the market between concentration yard and sawmills—sawmills are scattered along the Cauca and Patia rivers; and 4) the market between loggers and sawmills.

These markets are characterised by some severe imperfections, particularly by high levels of concentration and high barriers to entry. More than 50% of production is concentrated in just a few firms. With their large financial resources, such firms are in a position to squeeze out smaller competitors; they can set the price at the minimum level above marginal cost, or even to unprofitable short-term levels, to weaken their rivals or block the entrance of new firms. Fringe firms set their prices at levels that allow small profits; however, these prices are usually higher than those offered by the concentrated firms. Consequently, sawnwood market conduct is coercive, with the largest firms weakening their rivals.

The South Pacific region has the lowest indexes of quality of life in Colombia; 60% of the population lives in absolute poverty, only 30% has access to health services, and income distribution is highly unequal (Orozco 1999). Salaries in Nariño and Cauca's rural areas are lower than the average minimum salaries in the country: 79% of salaries are below the minimum wage. In addition, the forest is being depleted, and government and financial incentives are insufficient to encourage sustainable management practices in the forest.

Link men

Chain of commercialisation for South Pacific sawnwood



Source: Franco & Galindo (1998) and Minambiente (1999)

Conclusions

Partly because of its imperfect market system, Colombia is not benefiting as it could from its large forest area. Its international sawnwood trade is small compared to that of neighbouring countries Venezuela, Ecuador and Peru; the highly imperfect nature of the domestic market hinders the development of an export trade.

Reform of domestic timber markets has to become a priority for Colombia if they are to contribute as they should to economic development. The manufacturing of value-added timber products should be promoted in Nariño and Cauca to, among other things, increase employment. However, this promotion must be accompanied by good sources of credit and policy incentives that guarantee better use of the resources. Orozco (1997) proposes that larger firms should include local communities in the development of forest management plans; this study supports that view. Such plans could include agreements between firms and communities as a way of reducing barriers to market entry.

My research shows that the concentration yard market is particularly oligopolistic and also has fairly high levels of market power; therefore, extra attention should be paid to this market. The role of markets is to achieve a desirable rate of economic growth, to use resources efficiently and to help stabilise income and employment. Forestry markets are no exception; however, for these markets to properly fulfil this role, the capacity of government to facilitate the market system (by setting standards, enforcing regulations and helping develop human capital, for example) needs to be strengthened.

To correct market imperfections and to increase their currently low contribution to economic and social goals, more information is needed; for this, the SIEF, which has already benefited from an ITTO project, should be further strengthened at the regional and national levels. Forestry authorities should consider establishing a survey of timber-manufacturing industries as well as producers for all of Colombia's timber production regions.

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This work was carried out with the assistance of an ITTO fellowship grant.

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 the 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 mongraphs; 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 transparency of the international tropical timber market;
- promoting tropical timber from sustainably managed sources;
- supporting activities to secure tropical timber resources;
- promoting sustainable management of tropical forest resources;
- promoting increased and further processing of tropical timber from sustainable sources; and
- improving industry's efficiency in the processing and utilisation of tropical timber from sustainable sources.

In any of the above, the following are relevant:

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

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
- reasonable ness 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 **7 September 2005** for activities that will begin no sooner than 1 January 2006. Applications will be appraised in November 2005.

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

Legality shapes as new certification flash-point

ITTO international workshop on phased approaches to certification

19–21 April 2005
Bern, Switzerland

Verifying the legality of timber looms as a major issue in the debate over timber certification, judging from the outcomes of this workshop.

Forest certification is a means of verifying whether a particular forest area is well managed and, through labelling, of assuring consumers that in purchasing labelled wood products they are supporting sustainable forest management (SFM). The idea was proposed more than ten years ago as a way of reducing tropical deforestation; ironically, however, only 5% of the total global area of currently certified forests is located in the tropics.

According to ITTO's Executive Director, Dr Manoel Sobral Filho, there are two principal reasons for this.

"First, virtually all these tropical countries are developing countries facing competing demands for scarce resources. Forests seldom make it to the priority list," he said. "Second, these countries are dealing with natural tropical forests, where economic, environmental and social requirements for sustainable management are much more complex and demanding than those for non-tropical forests."

Attended by representatives of certification schemes, timber producers and buyers, certification agencies and environmental organisations, the ITTO-funded workshop sought ways of accelerating the certification of tropical timber and timber products.

"There exists in developing tropical countries a considerable gap between the actual level of management and what is required by certification," said Dr Sobral. "It would therefore be grossly unrealistic for these countries to be subjected to the full requirements of certification in one go."

One alternative would be to achieve certification in phases. Under this 'phased approach', full certification would remain the goal but companies and other forest owners would be able to achieve market recognition and benefits as they improved their forest management practices and moved towards full certification.

Workshop participants generally agreed that the verification of legal origin could constitute a first phase of a phased approach. However, some also called for the verification of legal compliance, which would require a more in-depth audit of adherence to relevant laws than is typically carried out as part of the forest certification process. Other participants expressed concern that this would constitute a major 'shifting of the goal-posts' for timber suppliers that would actually hinder their efforts to achieve SFM and certification.

According to ITTO's Amha bin Buang, placing too much emphasis on any specific criterion such as legal compliance runs the risk of losing the holistic nature of SFM.

"It has taken years for tropical countries to become acquainted with SFM and they are now being told that priority should be given to the assurance of legality and some social aspects," he said. "This shift serves more as a distraction from the overriding goal of SFM."

Mr Amha noted that tropical timber producers want to know the minimum requirements they must meet to enter particular markets, but these vary from country to country and, in many cases, continue to change.

"What tropical timber producers need most of all is certainty," he said. "Many have made significant strides in improving their forest management, despite the obstacles, and to make new demands on them now could force some out of the market.

"Without a market for their products they have no chance to achieve SFM—and some might be tempted instead to clear their forests for more profitable agricultural production."

A full account of the outcomes of the workshop, along with background documents and presentations, is available at the ITTO website (www.itto.or.jp).

More dialogue on illegal logging

TFD's dialogue on practical actions to combat illegal logging

7–10 March 2005
Hong Kong, PR China

This workshop, which was co-sponsored by ITTO, was attended by over 120 leaders from business, civil society and government; governments represented were the People's Republic of China, Malaysia (Sarawak and Peninsular Malaysia), Japan, Indonesia, the Philippines, USA, UK, Sweden, Russia and the European Union.

Workshop participants agreed that the highest priority was to ensure no wood is sourced illegally from national parks and reserves or stolen from local communities and private landowners. Such wood contributes to severe ecological harm, promotes social conflict, human rights' abuses and violence, results in huge economic losses and slows the development of poor countries. Illegal wood also depresses the prices of wood and paper products, harming companies that respect the law as well as undermining confidence in the industry.

Participants emphasised the steps that business and civil society can take quickly to reduce illegal logging. Priority actions emerging from the workshop include:

- collaborate to strengthen important existing alliances to combat illegal logging;
- use experience gained from ongoing partnerships to develop agreed, auditable, practical national legality standards to accelerate progress towards similar standards in other countries with a high risk of illegal logging;
- create a simple, credible, independent and objective ratings system that can be applied to identify high-risk countries and tree species.

Such a system would help forest products' companies, retailers and customers, as well as investors, creditors and insurers, to reduce the risk of supporting illegally sourced, harvested or traded forest products through their wood- and paper-buying and financial services. This could in turn lead to development of a ratings system for companies; and

- encourage companies to use innovative technology for wood tracking and share best practices to improve their supply chain management, reduce costs, and assist them in ensuring that illegally sourced, harvested or traded wood does enter their supply chains.

Importantly, there was strong agreement that law enforcement should be substantially strengthened in both exporting and importing countries. Exporting countries should take urgent steps to enforce laws that protect forests of high value for conservation and to protect local communities from conflict created by illegal logging. Importing countries can do much more to use existing laws to prosecute those involved in the import and distribution of forest products that are illegal in origin. The prosecution of large offenders, leaders of criminal syndicates and financiers of forest crime should be the highest priority in this much-needed global crackdown on forest crime.

This text is adapted from the personal summary of the co-chairs (Nigel Sizer, Cassie Phillips and Mubariq Ahmad). For more information contact: the Forests Dialogue, Yale University, 360 Prospect Street, New Haven, Connecticut, 06511, USA; Tel 1–203–432 5966; www.theforestsdialogue.org; info@theforestsdialogue.org

FLR discussed

Petrópolis Workshop on Implementation of Forest Landscape Restoration

4–8 April 2005
Petrópolis, Brazil

This workshop, which was co-sponsored by ITTO, brought together 109 experts from 42 countries and eleven international organisations to take stock of experiences to date in implementing forest landscape restoration.

The workshop had the following objectives:

- increase understanding of good practices and opportunities to optimise delivery of the benefits of FLR activities;
- stimulate the political support, policy and partnership arrangements and investment needed to implement effective forest landscape activities; and
- catalyse and demonstrate the implementation of FLR globally.

The workshop considered a range of case-studies emerging from national, sub-regional and regional workshops and the lessons learned from them. It explored key thematic areas, such as the contribution of FLR to livelihoods for the rural poor and innovative mechanisms for investment in FLR.

An interactive, facilitated field trip to three sites—Tijuca National Park, Sao Joao River Basin and the Mata Atlantica Biosphere Reserve—contributed to an increasing understanding of the FLR concept. Discussion following the field trips raised several considerations:

- **objectives:** projects were suited to resolving a specific problem, such as the protection of water resources or a species, to control erosion or secure an investment. In most cases the environmental or ecological objectives might be achieved, but not the socioeconomic objectives. It was therefore necessary to move up to programs instead of projects and to have an integrated strategy;
- **starting point:** FLR initiatives may have different starting points depending on who is promoting them. It was necessary to devise a participatory approach to analyse problems, to define responsibilities and strategies and to put these into effect. It was also necessary to take an adaptive approach which allowed the adjustment of objectives and strategies in the course of the work;
- **stakeholders:** in general, local communities and peoples had an insufficient level of involvement in the forest restoration initiatives visited during the workshop, but identifying and including all stakeholders is an essential element of FLR; and
- **future actions:** the absence of a long-term strategy posed problems for the sustainability of the project or the security of the investment. The absence, or inadequacy, of a participatory approach meant that local communities and people were not involved. Among the most important activities were those leading to the creation of revenue.

The participants recommended action on a number of fronts, including calling for better recognition of the needs of stakeholders, the development of macroeconomic policies that impact on FLR, the need to strengthen the capacity of disadvantaged communities or stakeholders, and the importance of strengthening decentralised processes.

The discussion also raised the issue of encouraging the full valuation of forest resources and ecosystem service payment systems that benefit the poor and the creation of economically viable management alternatives for small-scale producers.

Adapted from the report on FLR prepared for the 5th Session of the UN Forum on Forests by the governments of Brazil and the United Kingdom

Big-hearted

Heart of Borneo—three countries, one conservation vision

5–6 April 2005
Bandar Seri Begawan, Brunei Darussalam

This workshop, organised jointly by the Government of Brunei Darussalam and the Worldwide Fund for Nature (WWF), was attended by about 100 people. It was a meeting mostly of government officers from Sarawak, Sabah, Indonesia (including from local government in Kalimantan) and Brunei, along with international organisations, including ITTO, and a coalition of international and national non-

governmental organisations (including WWF International, Conservation International, WWF Malaysia, WWF Indonesia, the Wildlife Conservation Society and The Nature Conservancy). It was an exploratory exercise to assess the interest of the three countries in pursuing a joint approach to conservation along the upland 'spine' of Borneo. A preliminary map drawn by the NGO coalition shows an area running roughly southwest to northeast in the northern half of Borneo including both the Lanjak-Entimau/Betung Kerihun Transboundary Conservation Area (TBCA) and the Pulong Tau/ Kayan Mentarang TBCA (both of which are the subject of projects funded by ITTO) and covering a total area of more than 20 million hectares.

The hope of the NGO coalition was to start a process similar to that undertaken in Africa—started by the Yaounde Declaration and followed up by the recent 2nd Summit of Heads of State on Forests of the Congo Region (see *TFU* 15/1)—with the idea of giving momentum and credibility to a comprehensive transboundary approach through a high-level cooperation declaration.

More information is available from WWF Malaysia, www.wwfmalaysia.org; nali@wwf.org.my

Reported by Alastair Sarre

Vision and division

Global Forest and Paper Summit 2005: The Future of the Global Forest and Paper Industry

1–3 June 2005
Vancouver, Canada

www.globalforestpapersummit.com

This conference comprised three events: two conferences on the future of the global forest and paper industry, and one forum on best practices in communications. The first, *Delivering the Bottom Line: the 18th annual Global Forest and Paper Industry Conference*, was organised by PricewaterhouseCoopers and attended by over 600 people from industry, government and NGOs. The day focused on economic factors affecting the forest industry worldwide, mainly from the perspective of North America. A number of financial analysts presented their outlook for the world economy and how this would affect the forest and paper industry on a global scale. A mix of good and bad news was presented, with an emphasis on how the forest industry should capitalise on China's huge appetite for wood products, which several analysts predicted would continue growing for many years.

The second conference was entitled *Vision 2015: The Global Forest and Paper Industry's Coming Decade* and took place on days 2 and 3 of the Summit. One of the afternoon sessions brought together five speakers with different perspectives to discuss the sustainability of the forest and paper sector, including Gary Dunning (The Forests Dialogue), Tzeporah Berman (ForestEthics), David Refkin (Time Inc), Leif Broden (Sodra Group), and Gary Oker (Doig River First Nation). Berman and Oker gave impassioned speeches which included heavy criticism of the forest industry in Canada. However, no time was allowed for discussion or comments from the audience; this seemed simply to fuel increased resentment towards tribes and environmental groups, often seen as development 'roadblocks' by the world's large corporations. This lack of dialogue contradicted the purported spirit of the conference and did not enhance any mutual understanding between groups. During the meeting environmentalists staged protests against continued logging of boreal forest in British Colombia and logging in 'undeveloped' forests that was endangering mountain caribou.

The third conference focused on communications in the industry, and was organised by the Wood Promotion Network. A number of case-studies were presented by communications experts, who highlighted the need to identify target groups and set goals in communications activities. Karen Brandt (BC Market Outreach Network) gave a presentation on her organisation's efforts, stressing the importance of using simple language to convey complex topics and the need for communications tools that get the facts out quickly and effectively. Participants also received a folder which included a compilation of 'best practices' examples from around the world. ITTO's brochure, *A Meeting of Minds*, is included as part of this compilation.

Reported by Hana Rubin, ITTO Secretariat

Negotiators to reconvene next January

3rd Part of the United Nations Conference on the Negotiation of a Successor Agreement to the International Tropical Timber Agreement, 1994

27 June–1 July 2005
Geneva, Switzerland

Delegates made significant headway last week in the negotiation of a successor agreement to the International Tropical Timber Agreement, 1994, but will still need to reconvene next January. Progress was made during sessions of two working groups in such areas as definitions, objectives and voluntary funding. Delegates agreed on more than 20 articles, including articles on the annual report and review and duration, extension, and termination of the Agreement, all of which were sent to the legal drafting committee to be finalised. The two working group chairs used informal consultations to attempt to bridge the gap on key outstanding issues of finance, voting calculations, objectives and scope. This approach enabled many less important issues to be removed from the negotiating table.

However, delegates were not yet ready to compromise on issues that were most important for them. There are still clear divisions over the US, European Community and Producer Group proposals on finance: agreement on assessed funding for policy work and on how to generate more project funding has been difficult to achieve. For instance, producers and consumers alike expressed a desire for more predictable project and program funding, but that requires agreement on linked issues such as the scope of the Agreement and the structure of the Organization and its institutions.

Additionally, elements related to the distribution and calculation of votes were debated during discussions on definitions of 'producer' and 'consumer' members and 'tropical forest resources', with no agreement. Some of the discussions indicated divergent opinions, possibly even confusion, over how to combine forest resources and trade in the new Agreement. The Conference will reconvene on 16 January 2006, in Geneva, Switzerland.

Based on the summary written by the Earth Negotiations Bulletin *(www.iisd.ca/forestry/itto/itta3/).*

Recent editions

Edited by Alastair Sarre

Freezailah, B.C.Y., Basri, H. Mohd., Shaharuddin, M., Chandrasekheran, C., Wilson, S. & Tomaselli, I. 2005.* Sustainable management of tropical forests: private-sector experiences. Three volumes. *ITTO and Forestry Department, Peninsular Malaysia, Yokohama, Japan and Kuala Lumpur, Malaysia. Also available on CD. ISBN 983 9269 30 5 (Vol 1).

Available from: *Director General of Forestry, Forestry Department Headquarters, Peninsular Malaysia, Jalan Sultan Salahuddin, 50660 Kuala Lumpur, Malaysia; Fax 60–3–2692 5657; www.forestry.gov.my*

These three volumes, an output of ITTO PROJECT PD 48/99 REV. 1 (M, F), contain case-studies and regional analyses of private-sector experiences in sustainable forest management in the tropics. Companies featured include: Congolaise Industrielle des Bois (CIB) in its operation in the Republic of Congo; Rougier Gabon; Samartex Timber & Plywood Ltd in Ghana; Samling Plywood in Malaysia; Pt Sari Bumi Kusuma in Indonesia; the Pacific Timber Export Corporation in the Philppines; Vanimo Forest Products Pty Ltd in Papua New Guinea; and Guavirá Industrial e Agroflorestal Ltda and Orsa Florestal in Brazil.

FAO 2005.* Proceedings: 3rd expert meeting on harmonizing forest-related definitions for use by various stakeholders. *Convened 17–19 January 2005, Rome, Italy. FAO, Rome, Italy.

Available from: *FAO, Viale delle Terme di Caracalla, 00100 Rome, Italy; www.fao.org*

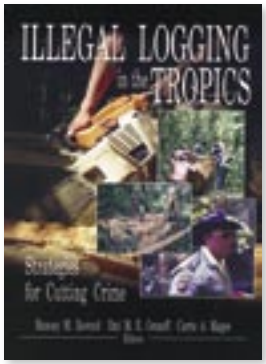
This is the report of an expert meeting organised by FAO in collaboration with various institutions including ITTO. The key terms discussed were natural forests, planted forests, forest plantations, trees outside forests, and managed and unmanaged forests. There was general, although not unanimous, agreement on working definitions of natural forest, planted forest and forest plantation, which is a subset of planted forest. The meeting also reached general agreement on a working definition of forest management, which was:

> *the formal or informal process of planning and implementing practices aimed at fulfilling relevant environmental, economic, social and/or cultural functions of the forest and meeting defined objectives.*

It was recognised, however, that the concept of managed/unmanaged forests adopted in climate-change negotiations is broader than the one traditionally used in the forestry community. In addition to discussing the above core terms, several groups addressed multilingual aspects of forest-related definitions, identified typical problems, and stressed the need for continued work.

Ravenel, R., Granoff, I., & Magee, C. (eds) 2004.* Illegal logging in the tropics: strategies for cutting crime. *The Haworth Press, Inc, Binghamton, USA. ISBN 1 56022 117 8.

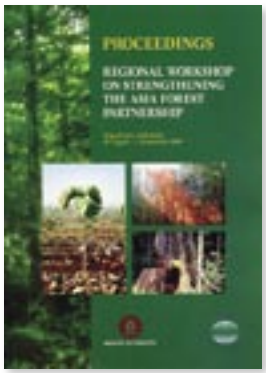
Available from: *The Haworth Press, Inc, 10 Alice St, Binghamton, NY 13904-1580, USA; www.haworthpressinc.com; getinfo@haworthpressinc.com; US$39.95 (softcover)*



This book, which arose from a meeting in March 2002 convened by the Yale chapter of the International Society of Tropical Foresters, suggests specific policy interventions aimed at curbing illegal logging and identifying solutions to forest crime. It presents both thematic analyses of illegal logging at the global level and case-studies at both the local and national levels in African, Latin American and Asian countries. Contributors draw on their experiences in Benin, Brazil, Cameroon, India, Indonesia, Mexico and Vietnam. *From the publisher's notes.*

Prihadi, N. (ed) n.d.* Proceedings: regional workshop on strengthening the Asia Forest Partnership. *Convened 30 August–1 September 2004. Yogyakarta, Indonesia. Ministry of Forestry, Jakarta, Indonesia and ITTO, Yokohama, Japan.

Available from: *Information Officer, ITTO; see page 2 for contact information.*



The specific objectives of the workshop were to: refine and operationalise the goals of the Asia Forest Partnership (AFP) and the mechanisms for its implementation; draw from experiences elsewhere; and formulate the programs, activities, structure and modalities of the AFP. This report contains papers presented by the representatives of the various partners, as well as background papers on the Congo Basin Forest Partnership, the ASEAN experience, and options for the development structure and mechanisms of the AFP. It also contains contributed papers on a wide range of issues relevant to the AFP, including the experiences of the private sector, illegal logging, forest-sector reform in Cambodia, and many others.

Letters

Sir

I am writing in response to the ITTO diagnostic mission report *Achieving the ITTO Objective 2000 and sustainable forest management in Cambodia*, which was summarised in the previous edition of the *TFU* (15/1).

The ITTO Objective 2000 is to "strive for an international trade of tropical timber from sustainably managed forests". Tying ITTO's assessment to this objective has produced a report that has little grounding in reality. In the first instance, the report contains no reflection on whether or not export-oriented timber extraction is an appropriate model for Cambodia, nor whether sustainable forest management is advisable in the forest areas currently allocated to production. Instead it recommends that the Cambodian government allow further cutting by the same concessionaires who have been the driving force behind illegal logging since the mid 1990s.

Cambodia's concessionaires comprise fly-by-night foreign 'investors' and mafia-style Cambodian operators with close links to certain senior officials. From the mid 1990s, these companies ripped through what the World Bank has termed Cambodia's "most developmentally important natural resource", leaving much of the forest severely degraded. Aside from illegal logging, the concessionaires' activities encompassed large-scale royalty evasion and human rights' abuses against local inhabitants.

> ***The ITTO mission's report … perversely links restriction on concession activities with an increase in illegal logging, a conclusion that disregards the well-documented evidence of large-scale violations by the logging companies over several years.***

This has not deterred the ITTO diagnostic mission from concluding that what Cambodia and its forests need is more industrial logging by the same companies. The report justifies its conclusion with arguments about the presumed ease of regulating large concessions and the claim that they will benefit local people and contribute to development.

Neither of these optimistic contentions is supported by the history of concession logging in Cambodia; indeed, with respect to the link between logging and development the mission's conclusion is an inversion of reality. Floods in 2000, which the UN linked to deforestation, are estimated to have cost Cambodia US$156 million. By contrast, the entire forest sector generated only US$92 million for the national treasury between 1994 and 2000.

A comparison of such figures does not take account of the damage the concessionaires have inflicted on rural livelihoods, notably those of the more than 100 000 people who depend on tapping resin from dipterocarp trees for part of their income. The concessionaires do not recognise the legal prohibitions on cutting resin trees and have violated them with impunity. Some companies themselves estimate that more than 80% of their annual harvest is composed of these trees.

Pressure on the Cambodian government to curtail the activities of the concessionaires prompted a moratorium on concession operations in 2002. An independent forest-sector review undertaken in 2004 recommended this suspension be made permanent and that the entire system be terminated. The ITTO mission's report, however, perversely links restriction on concession activities with an increase in illegal logging, a conclusion that disregards the well-documented evidence of large-scale violations by the logging companies over several years.

Equally misguided are the report's recommendations that the Cambodian government allocate other areas of production forest to annual coupes and proceed with the development of industrial tree plantations. Annual coupes appear likely to be even more subject to abuse and resistant to regulation than the concessions. With respect to tree plantations, moreover, the mission has completely failed to grasp the manner in which such schemes are already being used as a cover for the illegal clearcutting of Cambodia's natural forests, often by the same logging syndicates that control the logging concessions.

In summary, the ITTO diagnostic mission did not face up to unpalatable truths that might invalidate its assumption that the best use for Cambodia's forests must be export-oriented industrial logging. As such, its recommendations are damaging, wrong and deserve to be disregarded.

Mike Davis
Global Witness
Phnom Penh, Cambodia

The authors respond

Sir

Global Witness is correct in pointing out the abuses that have occurred in logging in Cambodia. The situation is indeed serious. However, the view of the ITTO mission was that simply identifying the problem was not enough—it is necessary to think of some solutions. Global Witness apparently believes that the logging ban provides that solution; the mission disagreed. Studies in several countries by FAO and many others show that logging bans are not only ineffective, they are often counterproductive. We believe this to be the case in Cambodia. The supply and price of timber in Cambodia has not declined since the logging ban was instituted and there is abundant evidence that illegal exports have continued at a high level. The logging ban has rendered such control as the government might have had even more ineffective—logging continues and the forests continue to be lost. If nothing is done then the forests will continue to be lost and degraded. In these circumstances the mission felt that re-opening some concessions with strict safeguards was one of the measures that could help to reassert control. We noted that the international community stood ready with a well-thought-through package of assistance to provide the needed safeguards.

Others have suggested that logging on an industrial scale should be permanently abandoned and all forestry should be given over to local control. We judged that the local capacity to manage such a process would take a long time to develop—perhaps decades—and that although this was an attractive option for the long term it would be insufficient to address the short-term emergency. There is a lot of evidence from other countries that in forest-rich situations and with sparse populations, concessions provide the most easily regulated approach to forest management.

Another point on which our assessment differs from that of Global Witness is that we concluded that, in the medium term, land conversion for local agriculture and estate crops constitutes the main threat to Cambodia's forests. These threats may be exacerbated under a logging ban, especially as land-clearing can be exploited as a loophole to gain access to valuable timber with no obligation to manage the resource—there is considerable evidence that this is happening in Cambodia. It is probably inevitable that much of Cambodia's forest will anyway be cleared for agro-industries in the longer term and again we felt that concessions with strong safeguards provide some disincentives to conversion.

Deforestation in Brazil

The overall rate of deforestation in the Brazilian Amazon increased significantly in 2004 compared to 2003, according to the latest report from Brazil's Institute for Environment and Natural Resources (IBAMA).

Total deforestation in the Amazon was an estimated 2.61 million hectares; this is an increase of 6% over 2003 but still below the highest recorded level of about 2.8 million hectares in 1995. Of the area deforested in 2004, 1.25 million hectares were in the state of Mato Grosso. The deforestation rate actually declined in some states: by 44% in Tocantins, 39% in Amazonia, 26% in Maranhão, 18% in Acre and 2% in Pará. Actions against illegal logging, on the other hand, increased: in 2004 IBAMA filed 6500 notices for logging-related infractions in the Amazon, which was an 80% increase over 2003; seizures of illegally-harvested timber declined from 70 000 m^3 in 2003 to 60 000 m^3 in 2004. The main cause of deforestation was agriculture, particularly the expansion of soybean production in Mato Grosso.

Peru wins award from NGO

The Government of Peru received a 'gift to the Earth' award from the environmental organisation Worldwide Fund for Nature (WWF) last March. The award was made for the government's leading role in the establishment of the Alto Purus National Park and the Purus Communal Reserve in the Peruvian Amazon. During the award ceremony, Peru's President, Alejandro Toledo, asked international creditors to exchange 30% of the country's bilateral debt for conservation. He also announced the creation of the National Institute of Development of the Andean, Amazonian and Afro-Peruvian Communities (INDEPA).

The Earthscan forestry library

Earthscan is offering a package of six forestry publications in English as 'the Earthscan forestry library'. The collection, which was overseen by Jeffrey Sayer, addresses key issues and innovations in the policies, practices and theories that are shaping forestry. Titles in the series include: *The sustainable forestry handbook* (2005; 2nd edition) by Sophie Higman, James Mayers, Stephen Bass, Neil Judd and Ruth Nussbaum; *The forest certification handbook* (2005; 2nd edition) by Ruth Nussbaum and Markku Simula; *Plantations, privatization, poverty and power* (2005) by Michael Garforth and James Mayers; *Policy that works for forests and people* (2004) by James Mayers and Stephen Bass; *Forests in landscapes* (forthcoming) edited by Jeffrey Sayer and Stewart Maginnis; and P*olitics of decentralization* (forthcoming) edited by Carol Pierce Colfer and Doris Capistrano. The series costs £154.85 and is available at www.earthscan.co.uk.

Global Witness also raises the issue of resin-tappers. Our report specifically highlighted the need for special measures to protect the livelihoods of these and other forest-dependent people. The trees that they tap can persist in managed forests—they will not be available in soybean fields or palm-oil estates. However, we also noted that resin-tappers are amongst the poorest people in Cambodia. Evidence from other countries suggests that as the economy grows and other economic opportunities become available many people abandon resin-tapping. The challenge—as our report points out—is to protect the interests of such people during periods of transition to new forms of livelihood, a time when such people tend to be very vulnerable.

The situation is indeed serious. However, the view of the ITTO mission was that simply identifying the problem was not enough—it is necessary to think of some solutions.

Overall we share many of the concerns that Global Witness has highlighted. Where we disagree is in the solutions. If nothing is done, the deterioration of Cambodia's valuable forests will certainly continue, and probably accelerate. A few large concessions with strong safeguards provide the best option for halting the decline. We judged that the potential for putting these safeguards into place is there and that this course of action provides the best way forward in the short term. Simply resorting to hand-wringing and arm-waving will not solve any problems and the way forward espoused by Global Witness may accelerate the decline of Cambodia's forests.

Jeff Sayer, Efransjah, Sheikh Ibrahim, Misao Ishijima and Xuhe Chen

Courses

Curso internacional en principios teórico-prácticos de la restauración ecológica

14–25 November 2005

Ciudad de Santa Clara, Cuba

Language: Spanish only

El curso persigue los siguientes objetivos:

Objetivo general: Actualizar y elevar el nivel de conocimientos en aspectos teórico-práctico sobre manejo de la flora, la fauna silvestre, y otros elementos del ecosistema para desarrollar sobre bases científicas, la restauración de ecosistemas degradados.

Objetivos específicos:

1) Desarrollar sobre la base del marco teórico y metodológico para restauración ecológica desarrollado por GCRE, la visión general sobre la aplicación de la técnica de restauración;
2) Conocer la estrategia metodológica y aspectos teóricos necesarios para la confección de la línea base de un proyecto de restauración ecológica, sobre la base de la realización de estudios de flora, vegetación, fauna y otros elementos del ecosistema en áreas naturales;
3) Conocer las bases teórico—metodológicas de los elementos de silvicultura necesarios para garantizar el manejo correcto de los elementos naturales objeto de estudio (suelos, bosques, viveros, fuego, etc.);
4) Conocer los aspectos teóricos—metodológicos para la realización de estudios ecológicos en ecosistemas naturales; y
5) Vincular los aspectos teóricos con actividades prácticas que refuercen los conocimientos adquiridos.

El Comité Organizador asegurará a los participantes el disfrute de un programa de alto rigor científico y de actualidad, que será desarrollado mediante conferencias y clases prácticas impartidas por profesores de vasta experiencia y alto nivel académico.

Informes: *MSc. Jesús Matos Mederos, jesusmatos@medscape.com o ffaunavc@enet.cu*

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.

Meetings

24–30 July 2005. **Regional Workshop on Sustainable Development of Rattan Sector in Asia**. Beijing, China. ITTO PROJECT PD 100/01 REV. 3 (1). ***Contact:*** *Huang Shineng, PhD, Assistant Project Director & Secretary of the Workshop Organizing Committee, Research Institute of Tropical Forestry, Chinese Academy of Forestry, Long Dong, Guangzhou 510520, PR China; Tel 86–20–8702 8675; Fax 86–20–8703 1622; snhuang@pub.guangzhou.gd.cn*

25–29 July 2005. **Ad hoc Technical Expert Group on Review of the Implementation of the Convention on Biological Diversity Programme of Work on Forest Biological Diversity: 3rd Meeting**. Bonn, Germany. ***Contact:*** *Secretariat of the Convention on Biological Diversity, 413 St-Jacques Street, 8th floor, Office 800, Montreal, Quebec, Canada, H2Y 1N9; Tel 1–514–288 2220; Fax 1—514—288 6588; secretariat@biodiv.org; www.biodiv.org*

26–28 July 2005. **Symposium on Tropical Rainforest Rehabilition & Restoration: Existing Knowledge and Future Directions**. Kota Kinabalu, Sabah, Malaysia. ***Contact:*** *Secretariat, Symposium on Tropical Rainforest Rehabilitation & Restoration, c/o Research & Development Division, Yayasan Sabah Group, 12th Floor, Menara Tun Mustapha, PO Box 11201, 88813 Kota Kinabalu, Sabah, Malaysia; joan@icsb-sabah.com.my; www.ysnet.org.my/symposium.htm*

3–4 August 2005. **International Workshop on Promoting Permanent Sample Plots in Asia and Pacific Region**. Bogor, Indonesia. Co-sponsored by ITTO under PROJECT PD 39/00 REV.3 (F). ***Contact:*** *Dr Petrus Gunarso, CIFOR, Jl CIFOR, Sindang Barang, Bogor 16680, Indonesia; Tel 62–251–622 622; Fax 62–251–622 100; p.gunarso@cgiar.org*

8–13 August 2005. **Forests in the Balance: Linking Tradition and Technology**. XXII IUFRO World Congress. Brisbane, Australia. ***Contact:*** *Congress Manager, PO Box 164, Fortitude Valley QLD 4006, Australia; Level 2, 15 Wren St, Bowen Hills QLD 4006, Australia; Tel 61–7–3854 1611; Fax 61–7–3854 1507; iufro2005@ozaccom.com.au; www.iufro2005.com/*

25–28 August 2005. **Management of Forest Ecosystems and its Impacts on the GHG [greenhouse gases] Budget**. Savonlinna, Finland. ***Contact:*** *Dr Markus Lindner, European Forest Institute (EFI), Torikatu 34, FIN-80100 Joensuu, Finland; Tel 358–13–2520240; Fax 358–13–124393; Marcus.Lindner@efi.fi; www.efi.fi/events/2005*

5–9 September 2005. **1st Intergovermental Meeting of the Great Ape Survival Program (GRASP)**. Kinshasa, Democratic Republic of Congo. ***Contact:*** *GRASP Secretariat, United Nations Environment Program; grasp@unep.org*

7–9 September 2005. **Review and Update of the ITTO Guidelines for the Conservation of Biodiversity in Tropical Timber Producing Forests**. Switzerland (exact venue to be decided). By invitation only. ***Contact:*** *Emmanuel Ze Meka, ITTO Secretariat; rfm@itto.or.jp*

10–15 September 2005. **Meeting of IUFRO Working Party 7.03.04 (Diseases and Insects in Forest Nurseries)**. Uherske Hradiste, Czech Republic. ***Contact:*** *Dr. Zdenka Prochazkova, WP Coordinator, FGMRI RS Uherske Hradiste, 686 04 Kunovice, Czech Republic; Prochazkova@vulhmuh.cz*

18–21 September 2005. **11th Symposium on Systems Analysis in Forest Resources and 3rd Iberian-American Symposium on Forest Management an Economics**. Ubatuba, Sao Paulo, Brazil. ***Contact:*** *Aline Formággio de Oliveira, Instituto de Pesquisas e Estudos Florestais—IPEF, IPEF Eventos 2005, Av. Pádua Dias, 11–Cx P 530 – Piracicaba – SP, Brazil; Tel 55–19–3436 8602; Fax 55–19–3436 8603; www.ipef.br/eventos/2005/melhoramento.asp*

19–23 September 2005. **The Stability of Tropical Rainforest Margins: Linking Ecological, Economical and Social Constraints of Land-use and Conservation**. Göttingen, Germany. ***Contact:*** *Daniel Steitenroth, SFB55—STORMA, Büsgenweg 1, 37077, Göttingen,Germany; Tel 49–551–39 9928; Fax 49–551–39 9658; sym2005@gwdg.de; www.storma.de/symp2005*

20–24 September 2005. **VII Plywood and Tropical Timber International Congress and VI Machinery and Timber Products Fair**. Belém, Brazil. ***Contact:*** *WR São Paulo; Tel 55–11–3722 3344; wrsp@wrsaopaulo.com.br*

26–28 September 2005. **ITTO International Conference on Tropical Plywood**. Beijing, China. ***Contact:*** *Paul Vantomme, ITTO Secretariat; itto@itto.or.jp*

30 September–6 October 2005. **8th World Wilderness Congress**. Anchorage, Alaska. ***Contact:*** *8th WWC Secretariat, The WILD Foundation, PO Box 1380, Ojai, CA USA 93024; Tel 1–805–640 0390; Fax 1–805–640 0230; info@wwc.org; www.8wwc.org*

17–28 October 2005. **7th Conference of the Parties to the UN Convention to Combat Desertification**. Nairobi, Kenya. ***Contact:*** *UNCCD Secretariat, PO Box 260129, Haus Carstanjen, D-53153 Bonn, Germany; Tel 49–228–815 2800; Fax 49–228–815 2898; secretariat@unccd.int; www.unccd.int*

24–27 October 2005. **Third International Precision Forestry Symposium**. IUFRO 3.00.00. Seattle, USA. ***Contact:*** *Peter Schiess; Tel 1–206–543 1583; Fax 1–206–685 3091; schiess@u.washington.edu;* ***or*** *Megan O'Shea; Tel 1–206–543 3073; Fax 1–206–685 3091; moshea@u.washington.edu*

30 October–2 November 2005. **China Wood Markets: Export & Import Conference, Exhibit & Industry/Mill Tour**. Dongguan, China. ***Contact:*** *R.E. Taylor & Associates, #501 543 Granville St, Vancouver BC, Canada V6C 1X8; Tel 1–604–801 5996; Fax 1–604–801 5997; retaylor@woodmarkets.com; www.woodmarkets.com*

7–12 November 2005. **39th Session of the International Tropical Timber Council and the Associated Sessions of the Committees**. Yokohama, Japan. ***Contact:*** *Information Officer (Mr Collins Ahadome); Tel 81–45–223 1110; Fax 81–45–223 1111; itto@itto.or.jp; www.itto.or.jp*

15–17 November 2005. **8th Round-Table Conference on Dipterocarps**. Ho Chi Minh City, Vietnam. ***Contact:*** *Dr Nguyen Hoang Nghia APAFRI Secretariat, FSIV c/o FRIM. Kepong, 52109 Kuala Lumpur, Malaysia; Tel 6-03-6272 2516; Fax 6-03-6277 3249; nhnghia@netnam.vn* ***or*** *secretariat@apafri.org*

15–18 November 2005. **3rd Latin American Forestry Congress (Tercer Congreso Forestal Latinoamericano—CONFLAT III)**. Bogotá, Colombia. ***Contact:*** *Colombian Association of Forest Engineers (Asociación Colombiana de Ingenieros Forestales—ACIF), Calle 14, No 7-33 Of. 403, Bogotá, DC, Colombia; Tel 571–281 8215; Fax 571–281 4912; acif@acif.com.co; www.acif.com.co*

23–25 November 2005. **5th Iberoamerican Forest and Environmental Law Congress**. Mexico. IUFRO 6.13.01. ***Contact:*** *Fernando Montes de Oca Dominguez; Tel 52–33–3615 0473; fernandomontesdeoca@imdefac.com.mx*

25–27 November 2005. **Expo Forestal: Mexico Siglo XXI: Bosques y Selvas para Siempre.** Morelia, Mexico. ***Contact:*** *CONAFOR, Avenida Progreso No 5 Edificio de Incendios Forestales PB, Colonia del Carmen Coyoacán, CP 04100 México, DF, México; Tel 52–55–5659 9502; Fax 52–55–5659 9503; jmandeur@conafor.gob.mx; www.conafor.com.mx*

28 November–2 December 2005. **11th Meeting of the Subsidiary Body on Scientific, Technical and Technological Advice**. Montreal, Canada. ***Contact:*** *Secretariat of the Convention on Biological Diversity, 413 St-Jacques Street, 8th floor, Office 800, Montreal, Quebec, Canada, H2Y 1N9; Tel 1–514–288 2220; Fax 1—514—288 6588; secretariat@biodiv.org; www.biodiv.org*

20–31 March 2006. **8th Meeting of the Conference of the Parties to the Convention on Biological Diversity**. Brazil. ***Contact:*** *Secretariat of the Convention on Biological Diversity, 413 St-Jacques Street, 8th floor, Office 800, Montreal, Quebec, Canada, H2Y 1N9; Tel 1–514–288 2220; Fax 1—514—288 6588; secretariat@biodiv.org; www.biodiv.org*

26–29 September 2006. **Patterns and Processes in Forest Landscapes: Consequences of Human Management**. University of Bari, Italy. ***Contact:*** *Prof Giovanni Sanesi, Dip Scienze delle Produzioni Vegetali, Faculty of Agricultural Science, Program in Forestry and Environmental Science, University of Bari, Via Amendola 165/A, Bari, Italy 70126; Tel 39–80–544 3023; Fax 39–80–544 2976; www.greenlab.uniba.it/events/iufro2006*

7–10 November 2006. **2nd Congreso para la Prevención y Combate de Incendios Forestales y Pastizales en el MERCOSUR**. Malargüe, Argentina. ***Contact:*** *Diligencia Viajes SA, Av Pte Roque Sáenz Peña 616, piso 8, Of 812, CP 1036, Ciudad Autónoma de Buenos Aires, Argentina; Tel 54–11–4342 9331/2057; Fax 54–11–4342 9546; viajesd@infovia.com.ar*

adjacent but non-overlapping spaces. Such a perception does not reflect reality. When the national park was created in 1993, little consideration was given to the traditional use and ownership of the area. Many local people were alienated and became resentful of the park; in some cases this is the root cause of deforestation, illegal logging and other destructive practices that have taken place inside the park. Planning the use of space in a way that provides local people with opportunities for development and the maintenance of their traditions and customary practices without compromising conservation objectives therefore becomes a crucial task.

In my view, an approach that relies on restrictions and prohibitions will not work in the current social, economic and political environment of Indonesia. Participative planning is essential, starting with the coordinated involvement of such local institutions as the BPD (village parliament), customary community forums, religious institutions, youth groups, women's organisations, the park management authority, and others.

The first steps towards zonation have been taken in the park, facilitated by The Nature Conservancy, an international environmental non-governmental organisation; this has produced a draft zonation plan. This draft could be used as a platform, but it is not enough on its own. The daily tasks of both park management and local livelihoods require that the zonation be done at a much more detailed scale, so that we start to see the delineation of specific features like river channels, animal paths, vegetation distribution and so on; deciding how such features will be 'zoned' needs the involvement of surrounding communities. This is where participative planning is required, and for this we have the example of the Ngata Toro indigenous community to follow.

Ngata Toro

The Ngata Toro village is an enclave in the Lore Lindu National Park; since the park was proclaimed the community has been working with outside support to establish its rights and responsibilities for the overlapping land. A first step was to document their local knowledge, customary laws and traditions and to map their interaction with the wild things—the vegetation, the fauna and the living space of the wildlife (habitat). This was done through a fully participative process that involved an exploration of the wisdom and mental maps of elders and community leaders, including (importantly) women. The knowledge thus documented was then used in a participatory planning process for the long-term management of the ecosystems that comprise the park. New management concepts have already emerged from this process that combine modern conservation practice, traditional management regimes, and a high degree of local participation in planning, decision-making and benefit-sharing. One of the most important outcomes so far has been recognition from the Lore Lindu National Park Authority of Ngata Toro's indigenous knowledge and traditional lands; some 18 000 hectares of their traditional lands lie within the borders of the park. The community now has access to important natural resources that might otherwise have been denied. At the same time, the community has developed a new institution to facilitate the role of women in natural resource management decisions.

We know that local communities can be effective and efficient conservation managers. For example, the zonation mandated by federal law would not be new to the people of Ngata Toro, who already have a zoning system comprising the *wana ngiki*, which is the 'forest towards the peak of the mountain that is far away', the *wana*, which is a pristine jungle that has never been developed as agricultural land, the *pangale*, the mountain forest, which is a transition between secondary and primary forest, the *pahawa pongko*, abandoned agricultural land, and the *oma*, which is frequently cultivated forest agricultural land.

Self-help: Ngata Toro community members tend a rice paddy together.

New management concepts have already emerged from this process that combine modern conservation practice, traditional management regimes, and a high degree of local participation in planning, decision-making and benefit-sharing.

Keeping the diversity

What is already taking place in the Ngata Toro community could be replicated elsewhere in Lore Lindu National Park, and in other conservation areas. The process of guarding the local space is done not just by one person, institution or party but in a participatory way involving many stakeholders. With the incorporation of local wisdom, and acknowledging local needs, traditions and rights, the management of natural resources becomes tailored to the unique characteristics of an area at a local scale. By taking this approach, the great diversity of this country, Indonesia, will not be lost.

Out on a limb

Local people are well-placed to develop zonation plans in Indonesia's Lore Lindu National Park

by Ir Helmi

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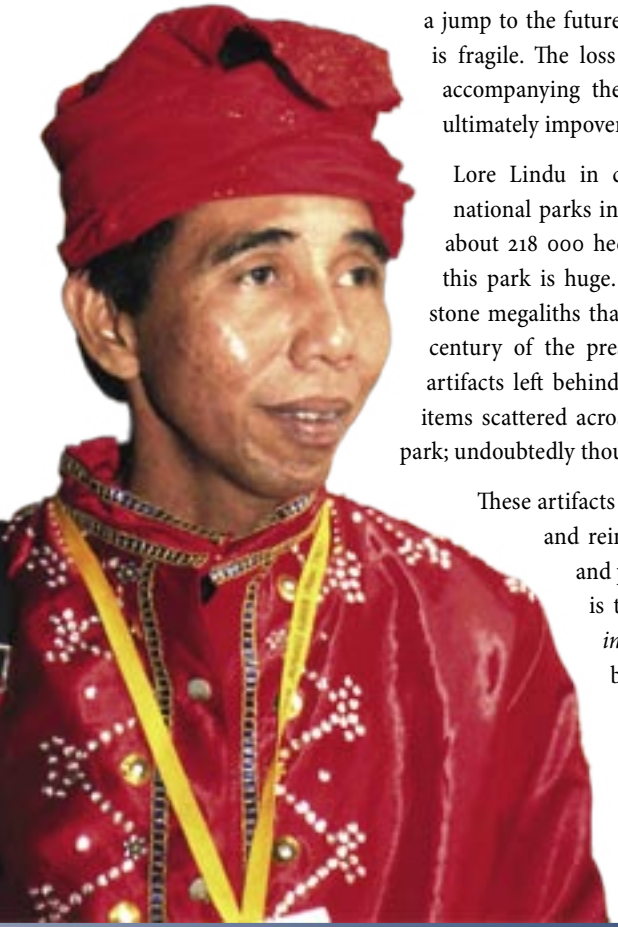
INDONESIA is a highly diverse country. From Sabang, at the western tip of Sumatra, to Merauke, on the eastern edge of Papua, its latitudinal breadth is similar to that of the Australian continent, and it contains more than 13 000 islands. The country's extraordinary diversity of traditions, customs and local languages is complemented by that of its species and habitats. There are countless examples of the interconnectedness of cultural and biological diversity, too: for example, the *sawo kecik* (*Manilkara kaukii*) tree has important religious meaning for the Javanese, while the courtship rituals of the *cendrawasih*, or bird of paradise, have inspired the dancing of the inhabitants of Papua Province. Equally, the biota has been influenced by its interactions with people over thousands of years, and the outcomes of these interactions give us what we know as Indonesia today.

But Indonesia is undergoing enormous social, economic, cultural and political change. Its population is still growing; numbering about 220 million now, it is expected to exceed 300 million by mid-century. The processes of growth, development and profound cultural change, coupled with recent dramatic political developments, are affecting the interrelation between mankind and nature; the two are becoming increasingly disconnected. This is worrying: a jump to the future is tough when the foundation is fragile. The loss of biological diversity that is accompanying these changes, if continued, will ultimately impoverish the nation.



Lore Lindu in central Sulawesi is one of 34 national parks in Indonesia; it covers an area of about 218 000 hectares. The cultural heritage of this park is huge. It contains, for example, large stone megaliths that date back to at least the 14th century of the present era. A 2001 inventory of artifacts left behind by our ancestors revealed 431 items scattered across 39 sites around the national park; undoubtedly thousands remain to be discovered.

These artifacts are 'silent witnesses' to the past and reinforce the notion that the past and present are linked. One example is the *ike*, which are still used by *ina-ina* (women) for making bark cloth. The nature of the *ike* varies. *Ike pehelai'i* has a coarse texture and is used to quickly break up the bark. *Ike pekero* is less coarse, while *Ike pebengka* has diagonal markings and is used to stretch out the processed material. *Ike pepaupu* is smooth, with vertical markings, and is used to finish the process.

The harvesting of the raw materials for bark cloth shows the deep understanding that local people have of their natural environment. They use the leaves of harvestable trees (such as *beringin*, *nunu*, *kate—Ficus* spp, tea—*Artocarpus* spp and *malo—Broussonetia* spp) as indicators: if the leaves are too young or too old, the bark is fragile and difficult to separate from the bole. When the leaves are at an appropriate age, however, the bark is not only easily harvested but the fibres are also stronger.

Zoning out

Management of the national park is a work in progress, but progress has been slow. According to national law, the park should be managed through a zoning system which consists of a core zone, a utilisation zone and other zones depending on necessity. Other laws specify the rights of *adat* (tribal/indigenous) communities, and others detail mechanisms for community involvement in the spatial planning of a region. And there are many other such regulations.

However, when the law (*de jure*) encounters the reality (*de facto*) in and around the Lore Lindu National Park, the picture is stark. Logging continues inside the park, and forests are cut to make way for plantations of coffee and cocoa; the harvesting of rattan goes on uncontrolled; rivers carve new paths; floods and landslides are frequent; land is bought and sold illegally; people demand removal of the established park boundary markers; in-migration from elsewhere in Indonesia swells the local population and increases the demand for land. The Lore Lindu National Park Authority has a vision for the park: *a sustainably managed Lore Lindu leads to a prosperous community*. The question is, how can we bring this to reality?

A participative approach

The Lore Lindu National Park is designated in the Provincial Land-use Plan of Central Sulawesi as a protected area, while adjoining villages are designated as cultivation areas. Under an 'old-style' approach to conservation, the national park and the village are perceived as two

Continued on page 31