ITTO

TROPICAL FOREST U·P·D·A·T·E

A Newsletter from the International Tropical Timber Organization to Promote Conservation and Sustainable Development of Tropical Forests

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Tribute to a Forester

This year marks the end of an era for ITTO, for it has seen the departure of the man who has led the Organization from its earliest days. Dr B C Y Freezailah retired from his position as Executive Director of ITTO, which he held for over 12 years, and returned to his home, Malaysia, in March. Members of the Council, however, were gratified that he agreed to join delegates for a few days of the 26th Session of the ITTC in May, providing them with the opportunity to thank him personally for all that he has done for the Organization.

Dr B C Y Freezailah, Executive Director of ITTO, 1986-1999.

Amongst the many expressions of appreciation and admiration, more than once Dr Freezailah's association with ITTO was likened to that of a forester who had carefully tended a young seedling and nurtured it as it grew into a mature tree. He should now look with pride at the healthy individual he has left behind. Further tributes to Dr Freezailah are included on pages 4–7.

Other articles in this issue feature projects that also involve the cultivation of seedlings. Research and development work in the establishment of nurseries and plantations is assisting, e.g., in Colombia to conserve mangrove forests (pp 8–11), in Honduras to promote native timber species for commercial use (pp 14–15), and in the South Pacific to develop the genetic resources of the islands (pp 16–17). In each case, the ultimate goal is to encourage local communities and industries to take greater responsibility for ensuring the maintenance of a viable timber resource base.

An example of what can be achieved by active community participation is illustrated by an ITTO project where efforts to reverse severe degradation in the cloud forests of Peru through nursery establishment and replanting schemes has resulted in one community forming its own business enterprise (pp 10–11).

ITTO has, to date, put over 160 projects into the field and it is Dr Freezailah who is largely responsible for the extent of this project work. As we bid farewell to the Executive Director, I must also say goodbye as this will be my last edition of the *Tropical Forest Update*. One of the highlights of working as *TFU* Editor has been the experiences I have had visiting some of ITTO's field projects to see, at first hand, what is being accomplished on the ground. I would like to acknowledge the commitment of those who are implementing this work; it is they who are realising the objectives set out by the Organization. I would also particularly like to thank readers for their continued support and enthusiasm for the newsletter.

Catriona Prebble

Inside this issue:

- Report on the 26th Session of the ITTC
- Conserving Colombia's mangroves
- Improving statistical capability
- International Forest Students' Association

Redressing the Balance

A summary of events of the 26th Session of the ITTC held in Chiang Mai, Thailand

The Twenty-sixth Session of the International Tropical Timber Council, held in Chiang Mai, Thailand, from 28 May to 3 June 1999, got off to a lively start with a round of applause, led by the Chairman of the Council, Mr Jean-Williams Sollo, to acknowledge the contribution of Dr B C Y Freezailah who left the Organization in March after serving as its Executive Director for 12 years. Dr Freezailah himself joined delegates for the last three days of the meeting and a dinner was held by the Thailand Environment Institute and the Royal Forest Department of Thailand in his honour at which a number of delegates paid tribute to him. As a result of Dr Freezailah's departure, one of the key issues on Council's agenda for this Session included discussions on putting in place the procedure for appointing a new Executive Director. In his own address to delegates, Dr Freezailah urged members to ensure that the selection of his successor be made by consensus in a spirit of cooperation.

This Session was honoured by the presence of HE Dr Christina Amoako-Nuama, Minister of Lands and Forestry, Ghana; HE Mr Jean-Claude Kouassi, Minister of Environment and Forestry, Cote d'Ivoire; and HE Mr Pongpol Adireksarn, Minister of Agriculture and Cooperatives, Thailand, each of whom addressed Council. In his opening speech, HE Mr Adireksarn drew attention to the imbalance in discussions held in international tropical forestry fora generally which tend to focus on issues of conservation while neglecting those of the timber trade and the market. Transparency of the forest product market, market access and equitable pricing systems, he said, were equally important and vital for the success of forest resource conservation and sustainable forest management.

Emphasising Trade

Indeed this was a recurring issue during the Session, which was dominated by discussions on the timber trade and market and the need for ITTO to give more emphasis to this aspect of the Organization's work. Presentations were made on the report previously commissioned by Council, 'The Promotion of Market Access Opportunities for International Trade in Tropical Timber', and on the interim report, 'The

ITTC guests at the reception hosted by Thailand's Director-General of Forests, Dr Plodprasop Suraswadi, at his ranch outside Chiang Mai: (from left to right) HE Mr Jean-Claude Kouassi, Minister of Environment and Forestry, Cote d'Ivoire; Mr Jean-Williams Sollo (Cameroon), Chairman of the ITTC; Dr Plodprasop Suraswadi, Director-General of Forests, Thailand; Mr Andre Atangana Zang, Charge d'Affaires, Embassy of Cameroon, Tokyo; and HE Dr Christina Amoako-Nuama, Minister of Lands and Forestry, Ghana.
Photo: Courtesy of ITTC Official Photographer, Thailand.

Contents

Redressing the Balance 2
Sayonara Dr Freezailah 4
Tribute to the Executive Director 6
Working with Mangroves 8
Demonstration Community Forest Management in the Natural Cloud Forests of Peru 12
Native Timber Species from the Moist Forests of Honduras 14
The SPRIG Initiative 16
Trade Pages 18-21
Improving Statistical Capacity and Reporting 18

Regular Features

Country Profile – Suriname 22
Institutional Profile 23
Fellowship Report 24
Current Literature 26
On the Conference Circuit 28
Topical and Tropical 29
Letter to the Editor 30
Course Calendar 31
Forthcoming Meetings 32

Downturn in the International Tropical Timber Market'. In addition, the theme of this year's Annual Market Discussion, organised by the Informal Trade Network Group, was 'The Downturn in the World Timber Market and the Positive Contribution that ITTO Should Make'. Debate on each of these agenda items resulted in a number of points being raised for ITTO's attention, including the need to aim for a balance in the work of the Organization, particularly project work, in order to encourage greater emphasis on the timber trade and industry; and the need for ITTO to support and promote the trade and to provide educational activities to ensure a greater flow of information to address the many misconceptions in the tropical timber market place.

Taking into account these discussions, Council decided to request that members report back at the 28th Session of the ITTC on their progress toward measures undertaken to eliminate any obstacles to market access for tropical timber. In addition, the Organization should endeavour to improve public understanding of the role and activities of ITTO in member countries, and the role of the tropical timber trade, in contributing to sustainable forest management. Council also agreed to implement a study on auditing systems/protocols for demonstrating forest management as part of the process of developing tools to improve market access for tropical timber.

Working Towards 2000

With the turn of the millennium rapidly approaching, Council recognised the need for ITTO to report on progress towards its Year 2000 Objective. It was agreed that at the 28th Session a preliminary review of progress would be made on member countries' efforts towards achieving the Objective and on ITTO's efforts to enhance the capacity of members to implement strategies for doing this. A number of countries made verbal reports at this Session on their respective initiatives towards achieving sustainable forest management.

As one measure to assist member countries in achieving the Year 2000 Objective, Council agreed at this Session to adopt the newly formulated *Manual for the Application of Criteria and Indicators for Sustainable Management of Natural Tropical Forests* and requested that this manual be published and disseminated widely. It was further agreed that workshops be organised to train trainers in the use of the manual and that field testing of the manual should be carried out. The manual provides practical assistance to countries and complements ITTO's revised criteria and indicators produced last year. One of the projects approved and funded at this Session is specifically aimed at testing the revised criteria and indicators in Cameroon.

ITTC delegates enjoying Thai hospitality and an opportunity to take a ride by elephant. *Photo: Courtesy of ITTC Official Photographer, Thailand.*

Further discussions were held on the utilisation of the Bali Partnership Fund and a decision was taken on the criteria established for the allocation of these funds to appropriate projects which are directly related to the Year 2000 Objective, as defined by the ITTO Libreville Action Plan.

Project Funding

During this 26th Session of the Council, a total of 23 projects and nine pre-projects were approved by Council. Pledges were made by donor countries to fund 23 projects, six pre-projects and other activities to a total value of almost US$9 million. Funding was provided by Japan (US$7 million), Switzerland (US$1.3 million), USA (US$411,000), Australia (US$43,000), France (US$33,000) and Korea (US$30,000). Included in the project funding were 24 Fellowship awards with a total value of US$140,000.

Thai Hospitality

Throughout the six-day Session, delegates were overwhelmed by the hospitality shown by their Thai hosts. In particular, following a field trip to visit activities being carried out by the Royal Forest Department in the environs of Chiang Mai, delegates were invited to a sumptuous reception hosted by Dr Plodprasop Suraswadi, Director-General of Forests, at his ranch nearby. Here guests had the opportunity to take rides on elephants, to be treated to a traditional Thai dinner and to enjoy a beautiful display of Thai dancing to the accompaniment of fantastic fireworks which lit up the night sky.

Sayonara Dr Freezailah

By Enzo Barattini

Deputy Head of Unit – Commodities, DGVIII Development, European Commission, Brussels

That morning in February was grey and wet. I had hardly arrived at my office when I was told that Dr Freezailah was on the telephone. It was one of our regular discussions, the result of our long and fruitful collaboration.

As usual we discussed the agenda of the next Council Session, the important points, the various problems. It was business as usual, and yet I felt an air of inexplicable sadness in his words. I was given the reason for this a few moments later when he told me of his decision to depart, to leave on tiptoe the Organization that he had created. He wanted to pass on the baton.

At the time I was speechless, devoid of reaction, dazed by the news. The grey Brussels sky had become even greyer. I remember simply replying that this decision seemed difficult to me, because ITTO and its members still needed him and his energy. In short, I asked him as a friend, as far as I could, to go back on his decision, which I considered to be the result of a moment of fatigue.

"Good timber could generate good trade."

Putting down the receiver, I remembered our long period of collaboration, starting on the benches of UNCTAD in Geneva, at the moment of his election as Executive Director. It was a difficult nomination, because it was also linked to the choice of headquarters for the future organisation. The long-awaited compromise was finally arrived at, but not without pain: Yokohama and Dato Dr B C Y Freezailah. A duo which has accompanied us ever since.

In Geneva, we laid the foundations of mutual confidence where the human element had the final word at the expense of the more subtle machinations of politics.

Passionate discussions immediately started on the right way of confronting the great challenge faced by any new organisation: how to organise itself, structure itself, position itself in relation to other similar initiatives, etc.

Under the watchful eye of Dr Freezailah, or Freddy, as we had become accustomed to call him, the old 'Sangyo Boeki' building, the first headquarters of the Organization and its Council Sessions, became a great crucible of ideas and initiatives, dedicated to reinforcing the role and function of this fledgling organisation.

Rapidly, there were dazzling results. The ITTO Mission to Sarawak was probably the first great success in which the mediation of Dr Freezailah proved to be decisive. How to work with the authorities of that State, a member of the Federation of Malaysia, so as to persuade it to accept an international mission to investigate the management of its forests? For a Malaysian national it was a point of principle to succeed where others had failed. Moreover, it allowed one to give a practical reply to the environmental movements which were, more and more, urging ITTO to act. It was a great success, with a report which, still today, is an object lesson to all the members.

Building on these brilliant and encouraging results, the following year we took the first step in the implementation of 'Target 2000', as we called it at that time. It was on the occasion of the Eighth Session of Council in Bali. What a Session! How many meetings, discussions, formal and informal consultations there were to establish what is today one of the main missions and objectives of ITTO.

Calm as ever, Freddy was reassuring everybody and urging them to embark on this new road, certainly, but he was also capable of offering a future of hope for all the countries which are members of the Organization. He saw that the priority aim of ITTO was precisely the achievement of a real rationalisation of the international trade in tropical timber through sustainable forest management implemented with the participation of everybody.

I remember that on the occasion of his opening speech at one of the first Council Sessions, he shared with the members his concern over the critical situation inherent in the general management of the forests. However, he encouraged us to act rapidly, to face up to this challenge, because he firmly believed that it was for us the great opportunity to show our value. This encouragement, I believe, continues still and is still of burning importance.

Tirelessly, Freddy then began to lay the foundations for a great debate within his institution: the certification of timber. In spite of the great difficulties involved in the

implementation of such regulations, he understood that any forest development had to be based on a genuine assurance as to the origin of the timber. Good timber could generate good trade. There followed major studies which are still our inspiration today in continuing the dialogue in this field.

However, ITTO could not remain silent in regard to general rules for achieving a truly sustainable management of the forests. At successive Council Sessions, plans of action were drawn up, guidelines laid down, criteria established, directives approved. Today, one is not surprised if reference is made, more and more, to this collection of measures, even outside ITTO.

So it is that ITTO, all these years, has never stopped growing. In the important post-Rio process, this Organization has initiated fruitful collaboration with all the other worldwide initiatives on forests. Today, it can well aspire to play the role of protagonist in the context of the enlarged debates within the IFF. Dr Freezailah will also be proud of this achievement, because his energy has allowed the forestry community to understand what the purpose of 'his' organisation was and to spread that knowledge.

Naturally, this way has not always been easy. Talking of all the forests situated beyond the Tropics reminds me of the intense period of renegotiation of the Agreement currently in force.

It was, once again, Geneva which made our paths cross, after lengthy and numerous preparatory sessions. However, the satisfaction at the completion of this work also coincided with the impossibility, for the European Community, of immediately approving the results.

My friend Freddy, surrounded by his staff and, in particular, James Aggrey Orleans, today the High Commissioner for Ghana in London, granted us the time we had not had in Geneva. He left the door open for reflection, staying in the background, but knowing that it was simply a question of time. He was right once again.

I was convinced that his work and his wise counsel would guide us at least up to the significant date, that of the Year 2000. It was what one expected, having given so much to the Organization, having sacrificed so much at the personal level.

This time, Freddy decided that his family came first, that the nostalgic voice of his Mother country was stronger than his attachment to 'his' Organization and 'his' staff.

We understand these sentiments and we respect him deeply.

Thank you, dear 'old' friend for all you have taught me (you know very well that the adjective 'old' refers only to our long friendship). The next Council Sessions of ITTO will not be the same, starting with the one in Chiang Mai, but I am certain that your future activities will cause our paths to cross soon, because I also know that you are not capable of simply watching the forest grow without intervening actively.

"We need more of the right action and we need it now."

These words, written ten years ago on the occasion of the presentation of the work by Duncan Poore, *No Timber Without Trees*, have remained indelibly printed on my mind. They could well be your motto, dear Freddy.

Sayonara Dr Freezailah …goodbye for now.

TWENTY-SIXTH SESSION
28 May – 3 June 1999
Chiang Mai, Thailand

STATEMENT 1(XXVI)
IN APPRECIATION OF THE OUTSTANDING AND DEDICATED SERVICE OF DATO' DR. FREEZAILAH BIN CHE YEOM AS EXECUTIVE DIRECTOR

The International Tropical Timber Council,

Recalling Decision 4(I) by which it appointed Dato' Dr. Freezailah bin Che Yeom as the Executive Director of the International Tropical Timber Organization (ITTO) from 1 November 1986 to 31 March 1990;

Further recalling Decision 2(VII), Decision 8(XI), Decision 5(XV), Decision 5(XIX) and Decision 7(XXIII) by which his appointment to the position has been extended consecutively to 31 March 2000;

Respecting his decision to relinquish the position as Executive Director;

Fully recognising his outstanding and dedicated service throughout his tenure as Executive Director;

Hereby extends its deepest appreciation and gratitude to Dato' Dr. Freezailah bin Che Yeom for his untiring efforts, invaluable contributions and dynamic leadership in guiding the growth and development of the International Tropical Timber Organization from its birth to its current standing at the international level and in enhancing international cooperation in the promotion of international trade in tropical timber, the sustainable management of tropical forests and the sustainable development of tropical forest industries.

Wishes Dato' Dr. Freezailah bin Che Yeom the best of health and every success for the future.

In Praise of the Executive Director

On the occasion of the leaving party held for Dr Freezailah and his family at the Royal Park Nikko Hotel, Yokohama, on 16 March 1999, on behalf of the ITTO Secretariat staff, Dr Manoel Sobral Filho, Assistant Director, Forest Industry, gave a speech from which the following is extracted:

Dr B C Y Freezailah and his wife, Mariam, at the party in Yokohama given in their honour. Photo: C Mayura.

Dr Freezailah was the founding Executive Director of ITTO, having taken his post in Yokohama in December 1986. His major task then was to start an organisation from scratch. But his work for ITTO precedes the establishment of the Organization, as he was an active member of the Malaysian delegation negotiating the International Tropical Timber Agreement (ITTA) from its genesis in the late seventies.

The major characteristic that, in 1986, drove Dr Freezailah from his position of Deputy Director-General of the Malaysian Forestry Agency to the driver's seat of ITTO, an organisation then existing only in the letter of the ITTA, was his deep concern for tropical forests and for human welfare.

Dr Freezailah's vision and dedication to international forestry cooperation is thus older than the movement of the 1980s and 1990s which placed tropical forests at the heart of the international debate on sustainable development and conservation. But while the international forestry agenda often focuses on the perceived contradiction between forest preservation and its potential for socio-economic development, Dr Freezailah, with his vision and wisdom, always saw and advocated that forest conservation and forest-based development are not mutually exclusive or contradictory. He wisely anticipated that only a balance between conservation and utilisation could effectively ensure that forests will remain a heritage of the future while also satisfying the needs of the present generation.

He thus directed his attention and energy toward creating an organisation dedicated to striking such a balance. Part of creating this balance involved ITTO's groundbreaking role in including NGOs, both from the trade and the environmental ends of the spectrum, in all of its deliberations. This was an idea that was championed and promoted relentlessly by Dr Freezailah and which has now been taken up by virtually every other international forum dealing with forestry.

> *"Dr Freezailah, with his vision and wisdom, always saw and advocated that forest conservation and forest-based development are not mutually exclusive or contradictory."*

Those who know Dr Freezailah also know that he is one of the most humble of men called to high office. It is truly remarkable that in his 12 years leading ITTO through its infancy to maturity, his humility has never faltered. Since he would never do so himself, let me highlight, on his behalf, some of the achievements he has overseen during his time with ITTO.

Under Dr Freezailah, the ITTO has developed into a unique organisation in which members are united in their efforts as equal partners. With a membership of 53 countries accounting for the bulk of the tropical forests in the world and almost all international trade in tropical timber products, the political and economic potential for cooperation in the ITTO forum is immense and it is being realised. The member countries in the ITTO are now committed to the Year 2000 Objective – our activities are geared towards promoting international trade in tropical timber from forests sustainably managed by the end of this millennium.

Within a few years of its birth, ITTO had already evolved into a major forum for policy dialogue, consultation, cooperation and assistance on all aspects of tropical forestry. And from having no field project activities in 1987, under Dr Freezailah's leadership ITTO has grown to a point where we are now financing about 160 projects designed to assist tropical forest development and conservation in Africa, Asia-Pacific and Latin America. Over US$160 million have been granted to developing member countries.

But this is not to say that there were no difficult times. For example, in the early 1990s when the environmental debate was at its most fractious he defended the tropical timber trade against extreme environmental NGOs and steered the Organization through some very turbulent waters. There were times when this debate became so politicised that there was a

real danger of permanent damage to the trade to the detriment of the producers, who in many cases relied on the timber sector to finance national development. As the stormy waters were calmed, in place of hostility and mistrust, Dr Freezailah built a mechanism for constructive dialogue between seemingly uncompromising parties.

In this context, one of the milestones in the achievements of the Organization was the ITTO Mission to Sarawak to assess the sustainability of forest management in this Malaysian State. This represented a unique initiative, which was a brave step for such a young organisation to take, as the assessment process, inevitably, involved making criticisms as well as offering advice. Without the Executive Director's vision to initiate the Mission in the first place and the quiet diplomacy with which he worked throughout its duration, it would not have achieved its goal. The 'rainforest issue' and the Mission itself were highly controversial but the determination of the Executive Director and the Mission members to show that ITTO could – and can – assist in the long-term preservation of tropical forests has been borne out in the nine years which have followed. The findings of the Mission have largely been enshrined in the State's forest policy and Sarawak is now a leader in promoting sustainable forest management.

It is this characteristic diplomacy of the Executive Director that has also carried ITTO through the ups and downs which are part of the reality of an international organisation. He has been obliged to tread a very fine line in order to keep the member countries happy and their interests looked after – and to keep 53 countries happy for 12 years is no mean feat.

Let us recall that ITTO's host, the Government of Japan, has also recognised Dr Freezailah's achievements and, in July 1998, he was awarded the following high honour, presented by the incumbent Minister of Foreign Affairs, the Honourable Mr Keizo Obuchi, now Japan's Prime Minister:

"You have made the utmost effort by an international organisation to conserve tropical forests and you have contributed greatly to the strengthening of friendly relations between Japan and other countries. In recognition of your distinguished services, I hereby express my deep respect for you and have pleasure in awarding you an honour."

Finally, we would like to add that we do not think that Dr Freezailah is alone responsible for his bright and successful career at ITTO. We know that credit should also be given to his wife, Mariam, and his children, who provided him with a supportive family environment throughout his tenure with ITTO. ■

Vacancy for the Position of Executive Director of ITTO

The International Tropical Timber Organization (ITTO), a commodity organization headquartered in Yokohama, Japan, is in the process of appointing a new Executive Director. The ITTO mission is to facilitate discussion, consultation and international cooperation on issues relating to the international trade and utilization of tropical timber and the sustainable management of its resource base.

The Executive Director is the chief administrative officer of the International Tropical Timber Organization and is responsible to the International Tropical Timber Council for the administration and operation of the International Tropical Timber Agreement, 1994, in accordance with decisions of the Council.

Candidates with the following qualifications may apply:

1. Professional Experience

(i) Managerial experience – a proven track record in managing programs, staff and finances, preferably in matters relevant to the work of the ITTO;

(ii) International experience – previous governmental work and experience in dealing with international organizations.

2. Background

Advanced degree, preferably in matters relevant to the work of the ITTO.

3. Language

Proven ability in both oral and written communication in one, or preferably more, of the working languages (English, French and Spanish) of the ITTO.

4. Nationality

Candidates should be nationals of ITTO Member countries and should be endorsed by their respective governments. Only one candidate per country can be endorsed.

Salary and Emoluments

Salary is equivalent to that of an Assistant Secretary General (ASG) in the scale of the United Nations, including benefits such as removal expenses, home leave travel every 24 months, children's education grant, rental subsidies, etc.

Any national of an ITTO Member country (see list below) may apply. Interested persons must submit their applications for ITTO consideration accompanied by a letter of formal endorsement from the Government of their respective countries. A list of ITTO contact points in member countries can be obtained upon request from the ITTO Secretariat at:

International Tropical Timber Organization (ITTO)
International Organizations Center, 5th Floor
Pacifico-Yokohama, 1-1-1, Minato-mirai
Nishi-ku, Yokohama, Japan 220-0012

Tel: (81-45) 223-1110
Fax: (81-45) 223-1111
Email: itto@mail.itto-unet.ocn.ne.jp

Applicants should seek Government endorsement by 31 August 1999. Government endorsed applications should be received at ITTO headquarters by 14 September 1999.

List of ITTO member countries:

Australia, Austria, Belgium/Luxembourg, Bolivia, Brazil, Cambodia, Cameroon, Canada, Central African Republic, China, Colombia, Côte d'Ivoire, Democratic Republic of Congo, Denmark, Ecuador, Egypt, Fiji, Finland, France, Gabon, Germany, Ghana, Greece, Guyana, Honduras, India, Indonesia, Italy, Japan, Liberia, Malaysia, Myanmar, Nepal, Netherlands, New Zealand, Norway, Panama, Papua New Guinea, Peru, Philippines, Republic of Congo, Republic of Korea, Spain, Suriname, Sweden, Switzerland, Thailand, Togo, Trinidad and Tobago, United Kingdom, United States of America, and Venezuela.

Working With Mangroves

An ITTO project addresses the conservation and management of Colombian mangrove swamps for multiple use and development

By Heliodoro Sánchez

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Dry mangrove forest on San Andres island. *Photo: C Prebble*

Mangrove forests are found along both the Caribbean and Pacific coastlines of Colombia. They are located in areas where annual rainfall ranges from 200 mm in the Department of Guajira on the Caribbean coast to 2000–6000 mm on the Pacific coast. Nine mangrove species have been identified in the country and generally these follow a zoning from the tidal line inland.

Since the middle of this century, mangrove forest logging has taken place in Colombia to supply products required for the construction of low-cost holiday homes, including rods, beams, props and poles, as well as for electricity posts and for fuel and charcoal. In addition, almost all the 'skeletons' of canoes in the coastal region are made from mangrove wood. Until a ban was imposed in 1978, on the Caribbean coast logging took place to supply wood chips for the production of particleboard, and from 1945 to 1975 trees were felled on the Pacific coast only to obtain bark for the extraction of tannin, while the wood was left behind in the forest.

Positive impacts that have led to the growth and expansion of mangrove ecosystems include allogenic successions resulting from the colonisation of areas exposed to tidal action, particularly in the accretion areas of some river deltas. One clear example of this is the old delta of the Sinú River on the Caribbean coast where large areas covered by rice crops were colonised by mangrove forests. These are now thriving due to the change of the course of the river. This and other similar examples illustrate the invasive and positive aggressiveness of mangroves.

The major anthropogenic stress factors for mangrove forests in Colombia include the processes of tourism expansion (see Box 1), land-use changes for agricultural purposes, civil engineering works, drainage and sewerage, the building of shrimp farms, industrial activities, disposal of industrial and domestic waste and the unsustainable harvesting of resources. These cause the degradation of hundreds of mangrove forest hectares, resulting in a loss of biomass, the disappearance of ecological niches, biodiversity reduction, the creation of salt flats, a reduction in tree size and vigour, sedimentation of water bodies, and a loss of beaches and coastline due to marine erosion.

The ITTO-funded project, 'Conservation and Management for Multiple Use and Development of Mangrove Swamps in Colombia' (PD 171/91) is working to address some of the above issues and their adverse effects. The project is being implemented by the Colombian Reforestation Association (Asociación Colombiana de Reforestadores) with the support of the Ministry for the Environment, together with a number of autonomous corporations.

Considering Alternatives

The project components include research, conservation, restoration, use, management and development of mangrove ecosystems in Colombia; the aim is to improve scientific knowledge in order to develop strategies for the mangroves in consonance with the national environmental management policy and the principles of sustainable development and community participation.

The main objectives of the project are:

- to strengthen the generation of socially and environmentally sound alternatives for the sustainable utilisation of mangrove forests, ensuring their conservation and preservation, and with the communities of the Colombian coastal regions as the prime beneficiaries; and
- to monitor and control salinity, water level and laminar flow parameters as the determining factors of mangrove forest health.

Phase I: Diagnosis

During Phase I of the project, a diagnosis of the current status of mangrove resources and a preliminary zoning of the mangrove forests in the Caribbean and Pacific coastal regions were carried out. Mapping activities on the Pacific coast were based on INTERA radar images taken in 1992 and traditional aerial photographs, while for the Caribbean coast 1991 and 1996 Lansat TM satellite images were used, in addition to aerial photographs.

Data were also recorded on forest structure, dynamics and composition, limiting factors, stress factors, and social and cultural aspects of the mangrove forests. The number of individuals per category and species was estimated for the various sampling sectors, as well as relative density, absolute and relative frequencies, basal area, and relative dominance and significance. Based on all this information, preliminary management units were proposed (Sánchez-Páez *et al*,1997a, 1997b).

The location and characterisation of mangrove areas for both coastal regions are reflected in the 24 1:100 000 scale maps which the project has produced. It was estimated, based on these maps, that in 1996 there were 379,954 ha of mangrove forests in the coastal regions of Colombia. These comprised 87,230 ha on the Caribbean coast, distributed along the sea and estuary coastlines of the nine departments of this region, and 292,724 ha distributed throughout the four departments of the Pacific coast region.

Out of the five species identified on the Caribbean coast, *Avicennia germinans* (black mangrove) and *Rhizophora mangle* (red mangrove) are the most commonly found and used, followed by *Laguncularia racemosa* (white mangrove), *Conocarpus erecta* (zaragoza mangrove) and *Pelliciera rhizophorae* (piñuelo mangrove). The latter is not well-known in the Caribbean region, there being records of individuals in only a few places. On the Pacific coast there is a predominance of *Rhizophora* spp. (*R. mangle*, *R. harrisonii* and *R. racemosa*), followed by *Pelliciera rhizophorae*, *Mora oleifera* (nato mangrove), *Avicennia germinans* and *Laguncularia racemosa*. The species *Conocarpus erecta* is scarce and only represented by a few isolated individuals.

A total of 35 management units were demarcated on the Pacific coast, comprising preservation areas (13), rehabilitation areas (8), multiple use areas (8), and production areas (6). Zoning in the Caribbean region provided for large areas for rehabilitation and preservation purposes, as well as for multiple use areas. Rehabilitation areas are characterised by a high degree of mangrove logging and degradation, coupled with intense or continuous stress factors. Supplementary information on the mangrove flora and fauna from the two regions was also produced by the project (Sánchez-Páez *et al*,1997a, 1997b).

In addition, a preliminary description of the social organisation of mangrove forest communities and the difficulties and problems they face has been completed; and some of the complex ethno-cultural relationships between the communities and their use of mangroves have been identified, including information about the species and products harvested, and their market prices.

Phase II: Mangrove dynamics

The outputs of Phase II of the project can be classified into the following five major areas:

(a) Growth dynamics and natural regeneration

A total of 25 permanent growth plots were established in the Caribbean region. The most significant annual diameter increments found were for *Avicennia germinans, Laguncularia racemosa,* and *Rhizophora mangle*. Natural regeneration rates were generally found to increase moving south-westward along the Caribbean coast, from the Department of Guajira in the far north-east of the country which had

Box 1: Competing with Development

Off Colombia's north coast lies the archipelago of San Andres. The remit of the ITTO project extends to these Caribbean islands, where it is working in collaboration with CORALINA (Corporacion para el desarrollo sostenible del archipelago de San Andres, Providencia y Santa Catalina), the autonomous corporation with responsibility for the sustainable development of the islands, to preserve the mangroves.

The mangroves of the archipelago, and the coral reefs surrounding, are vital for the economic survival of the islands because they provide the breeding grounds and habitats for the fish and other fauna on which the local population depends for its livelihood. If the mangroves disappear, so too will its fauna. The entire mangrove area of the islands has been designated a regional national park which protects the pockets of mangrove forest existing on the three main islands of San Andres, Providencia and Santa Catalina. However, with a population of 100,000, growing annually at four per cent, the mangroves on San Andres particularly, are coming under increasing threat, as competition with the islands' main industry, tourism, intensifies.

In recent years, the mangroves have been depleted due to land clearing for new building developments, contamination with oil and hot water from an electric plant and, additionally, the destruction of nine hectares of forest in 1993 by fire; the mangroves have also suffered from water contamination as a result of uncontrolled sewage and waste disposal. CORALINA is making efforts to reverse such effects and, as an example, successfully closed down, temporarily, one hotel which had not complied with regulations requiring it to utilise a water treatment plant.

The project has assisted with the development of guidelines for the conservation of the mangroves, including the drawing up of maps and a land use plan. Efforts are being made to establish a community nursery and generally to raise awareness about the mangroves; CORALINA has constructed an interpretive pathway through the mangroves at Bahia Hooker-Honda to encourage local interest and to educate people about the life which mangroves sustain. However on these islands, where there are few commercial incentives to encourage mangrove conservation, such as the potential for timber harvesting, and where alternative employment opportunities exist, it is not always easy to persuade communities to become involved in the long-term preservation of the mangroves.

Box 2: Pilot Project Plantations

Along the Colombian Caribbean coast, only the Department of Cordoba is currently permitted to exploit its mangroves for timber. A good relationship exists between the local government and communities and the people there have learned how to manage the forests sustainably. Elsewhere in the region, efforts are being made to educate communities so that they too understand the importance of the mangroves and the potential benefits that looking after them properly can bring.

An example of this is one of the pilot projects being supported by the ITTO project. The people of Pascaballos, near Cartagena in the Department of Bolivar, are extremely poor and the majority are unemployed. Under the leadership of their community representative, a nursery has been established to raise mangrove seedlings for replanting in surrounding areas. The members of this community are now actively involved in the nursery and plantation activities.

After nine to ten weeks' growth, seedlings from the nursery are ready to be transplanted; so far, 40 hectares have been replanted at two different sites. Tests are being carried out to determine the optimum spacing for seedlings in the plantations and measurements of dbh, height and the number of leaves are all being recorded. The pilot project has focused on using red mangrove (*Rhizophora* sp.), although in the two-year old plantation site at Bahia Barbacoa, white mangrove (*Laguncularia racemosa*) is now establishing itself naturally.

A wall of a building close to the mangrove nursery at Pascaballos, illustrating the community's interest in the pilot project. *Photo: C Prebble*

The aim is that eventually it will be possible to utilise these mangrove plantations for legal exploitation, but this will depend on the community developing a sound management plan and establishing strong links with local industry to confirm that there will be a continued demand for the timber. Such an arrangement would be mutually beneficial as the timber would be supplied at a reasonable price and the community would be guaranteed work. The main job now is to ensure that the community members have sufficient knowledge to be able to continue on their own what has been started by the project.

very low rates, through the Departments of Magdalena and Bolivar where rates gradually increased, to the north-west Department of Cordoba, which had the highest rates; the abundant fructification of *Laguncularia racemosa* being the determining factor.

In the Pacific region, 27 permanent growth plots were established. In general, the most representative species in these plots was found to be *Rhizophora mangle*. In only seven months of data recording, it was determined that significant differences in the availability of *Rhizophora* spp. propagules were directly related to the seasonal fructification of this species. Seedling establishment and recruitment seemed to be more related to the presence of mature trees and, in general, this species showed a sharp decrease in seedling establishment coinciding with the most intensive rainy season in the region.

(b) Ecosystem rehabilitation

The results obtained from two rehabilitation plots in the Caribbean region have shown *Rhizophora mangle* seedling survival rates of 100 per cent and 81 per cent in nursery, and 87 per cent and 95 per cent in plantation, respectively; in another plot, 67 per cent survival was recorded for direct seeding of propagules. Generally nursery seedlings showed better development after transplanting than the plants obtained through direct seeding.

In the Pacific region, tests with nursery-produced plant material also showed more positive results than those using direct seeding methods, with survival rates of 94 per cent and 84 per cent, respectively, for *Rhizophora mangle* which performed better than the other three species tested.

(c) Establishment of temporary nurseries

In the Caribbean region, five temporary community nurseries were established, together covering a total area of 5.2 ha for about 78,000 seedlings. The production of seedlings suitable for transplanting takes up to 75 days. All these nurseries have already had two production cycles with very good results.

On the Pacific coast, three previously built nurseries were refurbished and two new nurseries were built which were located near the marsh areas to facilitate irrigation and transplanting activities.

(d) Monitoring of water in the mangrove areas

The results obtained from 19 water monitoring stations located within the permanent growth and rehabilitation plots in the Caribbean region indicated that, due to water flow deficiencies and overexposure to light resulting from a lack of vegetation, in some internal or flood waters there was a warming tendency, with extreme temperatures of 40º C. During the sampling periods at most other stations, internal waters showed more favourable conditions and non-critical levels, with temperatures averaging 29.8º C. The pH levels observed were normal. Salt concentrations in mangrove waters varied according to the location, with significant increases evident during drought periods and decreases during the rainy season. In several stations of this region, salinity levels have been

recorded that may be critical to mangrove development.

On the Pacific coast, the 16 monitoring stations in the region indicated that inter-tidal waters in the mangrove forests show variations in salinity and oxygen levels measured, depending on whether there is high or low tide, and the influence of the sea and rivers and the location of the station. In general, temperature and pH level variability was much lower. The sharpest difference in average values was recorded for surface waters. Based on these findings, the Pacific mangrove forests should have adequate conditions for development.

(e) Development of pilot production projects

Four pilot production projects have been developed in areas of the Caribbean region where the major economic activity has been mangrove product harvesting. After being trained in mangrove nursery and rehabilitation activities, local communities submitted proposals for the restoration of mangrove areas and these proposals have been technically and financially supported by the project.

The pilot projects which have been implemented to date have resulted in the planting of 40 ha with *Rhizophora mangle* on degraded lands and alluvial flats in the Canal de Dique, near Cartagena (see Box 2), with plans for the planting of an additional 50 ha. Another pilot project aims to open up sedimented channels in order to restore the water dynamics, and thus the fish resource, to mangrove areas.

Similarly, three projects have been developed for the Pacific coast. One is focused on the farming of the fish species *Mugil curema*, using the mangrove swamps; another, implemented by the Charcoal and Fuelwood Producers Association of Tumaco, involves the farming and non-industrial harvesting of shrimp; the third project involves the establishment of food crops by the local communities to provide an alternative for those previously involved in forest logging.

Partial results of this second phase of the project have been widely distributed (Bravo-Pazmiño 1998, Guevara 1998, Ulloa *et al* 1998). In cooperation with the local communities, manuals have been designed and produced for mangrove rehabilitation and forest dynamics studies.

Benefits of the Participatory Approach

The information collected by the project has been disseminated at all levels and has been found to be very useful for natural resource administration agencies and for the communities living in mangrove forests or neighbouring areas. A particularly significant project output has been the ethnographic information on the communities in the Colombian Pacific mangrove areas, including references to social and cultural diversity and traditional activities carried out by black and indigenous communities in relation to mangrove ecosystems.

Two-year old plantation of *Rhizophora mangle* in the Canal de Dique, near Cartagena. *Photo: C Prebble.*

It is important to stress the receptiveness of the communities to the project activities and the raised level of awareness generally in the country, regarding the need for sustainable management and mangrove rehabilitation. The experiences of the pilot production projects are helping to encourage a diversification of activities in the areas where these ecosystems are found. This has particularly benefited the local communities in the search for socially and environmentally sound alternatives for mangrove utilisation. In order to strengthen local organisations, these communities have been trained in environmental education issues and in the revival of ancestral knowledge regarding mangrove forest harvesting.

The following publications, as well as 19 technical and promotional documents on the activities of the project, have been published and a specialised mangrove ecosystem documentation centre has been established, including a bibliographic database containing 800 research papers:

Bravo-Pazmiño, H. 1998. Diversidad Cultural y los Manglares del Pacífico de Colombia. In: Sánchez Páez, H. and Alvarez R. (eds). Santa Fe de Bogotá DC. Ministry for the Environment, ACOFORE, ITTO.

Guevara O, Sánchez H, Murcia G, Bravo H, Pinto F. and Alvarez, R. 1998. Conservación y Uso sostenible de los Manglares del Pacífico colombiano. In: Sánchez, H, Guevara, O, and Alvarez, R. (eds). Ministry for the Environment, ACOFORE, ITTO, Santa Fe de Bogotá DC.

Sánchez-Páez, H, Alvarez-León, R, Pinto-Nolla, F, Sánchez-Alferez, A S, Pino-Renjifo, J C, Acosta-Peñaloza, M T, and Garcia-Hansen, I. 1997a. Diagnóstico y Zonificación Preliminar de los manglares del Caribe de Colombia. MINAMBIENTE/ ITTO. Santa Fe de Bogotá DC.

Sánchez-Páez, H, Alvarez-León, R, Guevara-Mancera, O, Zamora-Guzman, A, Rodríguez-Cruz, H and Bravo-Pazmiño, H. 1997b. Diagnóstico y Zonificación Preliminar de los manglares del Pacífico de Colombia. MINAMBIENTE/ITTO. Santa Fe de Bogotá DC.

Ulloa, G, Sánchez, H, Rodríguez, H, Gil, W, Pino, J C and Alvarez, R. 1998. Conservación y Uso Sostenible de los Manglares del Caribe colombiano. In: Sánchez, H, Ulloa, G and Alvarez, R. (eds). Ministry for the Environment, ACOFORE, ITTO, Santa Fe de Bogotá, DC. ■

Demonstration Community Forest Management in the Natural Cloud Forests of Peru

An option to avoid the forest destruction caused by subsistence agricultural practices in the Urumba Basin, San Ignacio, Peru

By Manuel Pesantes Rebaza

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Community members actively participating in the reforestation of degraded areas, using mules to transport seedlings. *Photo: J Leigh*

The natural cloud forests of Peru are located in the north-east of the country, particularly in the elevated area of the province of San Ignacio in the Department of Cajamarca. These forests play a significant role in cloud water catchment, feeding the major rivers and streams that make up the hydrological system of this province. Furthermore, they constitute a unique ecosystem in the country because of the biological diversity that they support.

However, the cloud forests have been under constant pressure by migrant farmers from other regions who have spontaneously settled in these areas clearing lands for the practice of subsistence agriculture through inappropriate slash-and-burn techniques. The situation is now reaching alarming levels – according to data collected by the Regional Secretariat for Production-Extractive Activities in the north-eastern region of Marañón, between 1975 and 1990, a total of 122,840 ha of natural forest were deforested in the provinces of Jaén and San Ignacio, mainly as a result of agricultural activities carried out in forest production and protection areas. The living conditions of the communities in the Urumba watershed area in San Ignacio are precarious; the people live in a state of extreme poverty.

Community Involvement

In 1994 the ITTO project, 'Reforestation, Sustainable Management and Utilisation in the Natural Cloud Forests of Jaén-San Ignacio' (PD 42/92) was initiated by Peru's National Institute of Natural Resources (INRENA). The overall aim of the project is to raise the standard of living of the local populations in the Urumba Basin by encouraging their participation in managing the environment and utilising the forest and its resources sustainably.

During the first phase of the project (1994–1995), preliminary studies were carried out and strategies were designed to ensure the involvement of the local communities. One major requirement was to introduce to the communities the concept of conservation and persuade them of the value of the forest.

During Phase II (1996–99), a forest management plan has been implemented for the Urumba and Miraflores watershed areas to serve as a model for sustainable management. This has involved carrying out intensive reforestation, extension and training activities with the participation of the local populations.

A successful awareness-raising and local involvement campaign was initiated to ensure the participation of local personnel who have become experienced in activities such as seedling production and plantation establishment. For example, workshops have been organised to train locals in the establishment and maintenance of nurseries and, as communications between different settlements in this area are difficult, the project broadcast daily programmes on the local radio and published monthly articles in local newspapers to raise environmental awareness and to convey technical forestry and other information.

Furthermore, forest committees have been established in 17 villages in the Urumba Basin, and these are now actively involved in activities related to plantation establishment, the installation of nurseries, and management of both natural regeneration and plantations.

Communal Forest Enterprise

Despite their enormous potential, until recently, the forest resources of the Urumba Basin have contributed little to the socio-economic development of the rural communities living there. In fact, the people have been depleting resources in order to expand the agricultural frontier, thus worsening existing social problems, mainly as a result of a lack of knowledge and a failure to incorporate forestry into local productive activities. In this respect, one of the key activities of the project has been the establishment of the communal forestry and agricultural services enterprise, 'La Bermeja Ltd'.

This is a legally registered company whose shareholders are members of La Bermeja community, one of the small villages located in San Ignacio province. The company was set up with a view to improving the standard of living of its shareholders by the integrated sustainable development of its area of influence

through forest resource harvesting, processing, marketing, and reforestation activities. It is based on the concept that any profits resulting from these activities are distributed to each shareholder in proportion to the individual's contribution to the work of the company.

The responsibilities of this community-based company include the development of an operational management plan for a timber harvesting demonstration model, and the operation of a Timber Processing, Training and Production Centre in La Bermeja, and a Furniture Assembly and Sales Centre in Jaén.

Harvesting

A detailed forest inventory to identify commercial trees and to establish annual cutting volumes has been completed in order to design strategies for the harvesting of the forests in the Urumba watershed area. The inventory was carried out in 400 ha of production forest in the 2,054 ha Quebrada Torohuaca Management Unit. The total harvesting area for each annual cutting block is 36 ha, the limited size being justified by the demonstration nature of the activities. The harvesting area has moderately steep (15–25 per cent) to steep (25–50 per cent) gradients with soils of low to medium fertility. The forest in this region is dominated (60 per cent) by Andean pine (*Podocarpus* spp.).

A 100 per cent census of the first 36 ha annual cut block has been completed by La Bermeja Ltd and harvesting operations following a 'reduced-impact logging' design are underway. The harvesting begins with the quartering of timber to planks with chainsaw-based portable sawmills, alongside stump. These are then hand-carried to the existing roads and transported by mule to the Timber Processing, Training and Production Centre in La Bermeja. The advantages of these modes of transport include the minimal disturbance caused to the natural environment, their simplicity and adaptability to topographic conditions, and the lack of a need for major investment in road construction and logging equipment.

Processing

The Centre in La Bermeja has been established as a secondary timber processing plant, for the implementation of production activities to generate income for the company, and for the training of beneficiary communities. A power generator has been installed for the operation of the Centre's sawmilling and carpentry equipment. It has a band re-saw and complete band saw maintenance and sharpening equipment, as well as carpentry machinery. The Centre has an installed capacity of 1,600 cubic metres per year.

The simple products, such as tables, bed frames, and chairs, etc, which are made with the sawnwood and semi-processed timber brought to the Centre, are transported initially by mule and then by road to the company's Furniture Assembly and Sales Centre in Jaén. Here, the assembly and final finishing of furniture and other manufactured products made by the processing centre are carried out. The goods are then sold in markets in Jaén.

Marketing

In order to ensure the long-term success of La Bermeja Ltd, intensive training in business management, including sales and marketing, as well as in machinery maintenance, will need to be provided to the shareholders of the company. INRENA has proposed an additional element to the current ITTO project to extend training opportunities and thereby consolidate the achievements of the project to date.

Conclusions

- Forest management, through the harvesting and processing of forest products and their marketing as higher value-added products, represents for rural communities a realistic alternative to the waste and destruction of natural forests caused by subsistence agriculture.
- Activities aimed at sustainable forest harvesting can mobilise local manpower, generate financial resources, improve management practices and silvicultural prescriptions and attract government attention, thus leading to an improvement in the basic service infrastructure.
- Rural communities, which usually lack opportunities to overcome the conditions of poverty in which they live, will benefit both socially and economically.
- Through voluntary community participation, the reforestation activities have encouraged the interest of rural populations to reverse the trend towards natural resource degradation.
- The harvestable volumes of timber in cloud forests are high in comparison to other natural tropical forests in Peru and, if managed carefully, these forests can provide a sustainable source of income for the rural communities.
- The proposed forest management demonstration plan, based on community organisations and businesses, has been designed to ensure the participation of people in the Urumba Basin.
- It will be demonstrated that natural cloud forest management is consistent with resource conservation and can generate income to increase the standard of living of those people involved with the project, both directly and indirectly.
- The philosophy of the community company, La Bermeja Ltd, will enhance the chances of adequate harvesting control because it is in the interest of individuals to manage the forests sustainably.
- The participatory and community business nature of the project, its success in the fulfillment of established objectives, and the potential for the replication of its achievements, will facilitate its extension to other areas in the region. ■

Native Timber Species from the Moist Forests of Honduras

By Carlos H Sandoval and Jorge O Cálix

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Cojoba arborea in silvicultural trials at the Lancetilla experimental site. *Photo: C Sandoval.*

In 1995, the National School of Forestry in Honduras (Escuela Nacional de Ciencias Forestales – ESNACIFOR) began the implementation of a five-year ITTO project, 'Study on the Growth of Native Species of Commercial Interest in Honduras' (PROECEN) (PD 8/92). The focus of the project is applied silvicultural research which is being carried out in the remaining moist broadleaved forests along the Atlantic coast of Honduras, at different sites extending from the project headquarters, the Lancetilla Research Centre and Botanical Gardens.

PROECEN's main objective is to promote the establishment of commercial plantations of non-traditional timber species by the generation and dissemination of information about the silviculture and breeding behaviour of these native broadleaved species. This is being done by the development of appropriate technologies for seed collection and storage, propagation, and plantation establishment in order to encourage the use of these non-traditional species of commercial value.

Twenty-nine priority species were selected, on the basis of consultations with primary stakeholders involved with both the forest management and forest industry of these moist broadleaved forests. Consideration was given to market penetration levels of the different species, the degree of acceptance of these species by end-users, their potential to substitute for traditional species, and the distribution and frequency of the selected species in the forest.

The project comprises four different research components:

Phenological Studies

This component involves the study of the phenological changes, i.e. the flowering, seed production, foliation and defoliation cycles, of the selected species in response to seasonal changes. Trial sites have been established and, based on the information gathered over a three-year period, approximate seasons for seed collection have been identified for most of the species.

Flowering usually takes place at the end of the dry season and at the beginning of the rainy season, with fructification tending to occur later during the rainy season.

Germination Trials

Research in this component covers the process from seed storage to the production of seedlings for planting. Seed tests have included the study of various pre-germination treatments, such as soaking seeds in cold water and/or in water at a temperature of 80ºC, and seed scarification which, by making a number of small incisions on the shell surface, advances the natural process of decomposition of the hard seed shell. The results obtained indicated that in 68 per cent of cases, none of the treatments tested necessarily led to improved germination. Thus, it was concluded that the seeds of these species could be planted without prior treatment.

Mixed nursery trials using various degrees and combinations of chemical fertilisation –

both granular fertilisers (containing N-P-K) and spray-on foliar fertilisers – have revealed, after soil analysis, that certain species respond better to specific treatments which can help to reduce nursery time by up to two to four months. Species which responded to such treatments include: *Ceiba pentandra, Dalbergia glomerata, Cordia megalantha, Virola koschnyi, Tapirira guianensis, Synphonia globulifera, Calophyllum brasiliense, Tabebuia guayacan, Plathymiscium dimorphandrum* and *Brosimum alicastrum*.

In addition, different asexual reproduction tests were carried out on cuttings from six species, using polypropagators, hormones (auxins), and immersion in coconut water. The best rooting results were obtained with the use of hormones; after treatment, tests achieved root establishment in over 83 per cent of cases for *Terminalia amazonia, Tabebuia donnell-smithii, Ilex tectonica* and *Ceiba pentandra*. However, *Cordia megalantha* performed better under the immersion treatment, achieving root establishment levels of 80 per cent; *Junglans olanchana* performed unsatisfactorily under all the treatments tested.

Growth and Yield Trials

This component has mostly involved screening tests for site establishment of species and monitoring growth under different planting methods, i.e. seedling density, relative light/shade exposure, soil, climate, etc. The most common variables assessed are height and diameter growth, survival, and susceptibility to pests and diseases. By September 1998, the project had established a total of 42 trials in 11 sites as follows: 18 species site screening tests, 14 tests on planting methods, eight growth plots, and two strip plantation experiments.

Table 1 shows the eight species that performed best in three experimental sites under different soil and climatic conditions. Soils in Lancetilla are a combination of red and yellow latisols and litosols, with a predominant clay-sand texture; those in the area of the John F Kennedy Agricultural School are similar but with a sandy-loam texture and a shallow top layer. In the third site of La Virtud, soils are deep and well-drained latisols, with a clay-sand texture; for a long time this area has been used for cattle grazing so there is a high degree of soil compaction which negatively affects the behaviour of species under study. The table also shows that the species which performed most consistently in all sites was *Dalbergia glomerata*.

With regard to the tests on different methods for transplanting the seedlings (i.e. use of containers, pseudo-cuttings and/or bare root), the best performing species was *Tabebuia guayacan* which, at 18 months, satisfactorily responded to all test treatments in over 93 per cent of cases. Even though *Guarea grandifolia, Dalbergia glomerata, Virola koschnyi, Cordia megalantha, Calophyllum brasiliense, Tapirira guianensis, Cojoba arborea, Tabebuia donnell-smithii, Astronium graveolens* and *Ceiba pentandra* showed root establishment under all treatments, the best results were achieved through the container planting method with survival rates of over 88 per cent at ages ranging from six to 24 months.

Technology Transfer

In the dissemination of project results among target groups, use of existing extension, training and development frameworks in the country has assisted the effective transfer of information. Also, various events have been organised, including field days, exchange tours, workshops and short courses. Reports on the nursery, phenology and plantation research project findings have also been prepared and disseminated. As a result of this process, a positive response has been received from communities, forest industry, agricultural producers and other small and medium-sized investors who have established plantations using the species under study.

PROECEN is a pioneering initiative in Honduras. The completion of Phase I of this ITTO project will mark only the beginning of the research process which should be consolidated in a second phase by adding research into the financial aspects of plantation establishment, including costs of the different stages of the process, as well as more specific research on the most promising species. However, the information generated by the project so far will constitute a fundamental basis for promoting forest plantations within the framework of the Afforestation, Reforestation and Forest Protection Incentives Law in Honduras. ■

Table 1: Silvicultural Behaviour of Eight Native Species from Honduran Tropical Moist Forests in Three Experimental Sites at Age 2-years

Species	Lancetilla			John F Kennedy			La Virtud		
	Dbh (cm)	Height (m)	Survival (%)	Dbh (cm)	Height (m)	Survival (%)	Dbh (cm)	Height (m)	Survival (%)
Dalbergia glomerata	5.20	5.31	63	4.50	4.93	89	2.80	3.18	100
Plathymiscium dimorphandrun	6.20	4.60	93	3.80	3.54	70	1.20	1.11	93
Tabebuia guayacam	6.20	4.50	96	4.20	3.94	92	1.30	1.41	96
Ceiba pentandra	11.40	4.37	100	7.40	3.00	96	4.40	2.50	96
Vochysia guatemalensis	6.00	3.74	93	4.30	2.99	67	1.30	1.50	93
Cojoba arborea	4.20	3.10	100	3.60	2.88	92	1.40	1.06	100
Tabebuia donnell-smithii	4.00	3.00	44	4.30	3.52	67	2.80	1.26	37
Astronium graveolens	2.00	2.31	100	1.50	1.84	74	2.50	3.45	93

The SPRIG Initiative

A programme for vegetative propagation research, development and training in the South Pacific

By Stephen Walker

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Solomon Islands training course participants setting cuttings. *Photo: S Collins*

The South Pacific Regional Initiative on Forest Genetic Resources (SPRIG) is an initiative directed at better conserving and sustainably developing the region's forest genetic resources. SPRIG aims to promote ecological and sustainable development in the forest and natural resources sectors leading to enhanced quality of life for present and future generations of South Pacific islanders.

The goal of SPRIG is to strengthen the national capacity of developing countries of the South Pacific – especially Fiji, Vanuatu, Samoa, the Solomon Islands and Tonga – in the areas of collection, assessment, improvement and conservation of priority forest genetic resources.

SPRIG is a three-year pilot project running from 1997–1999, with major funding provided through AusAID and with the governments of the five SPRIG focus countries providing additional funding and in-kind support. The Commonwealth Scientific and Industrial Research Organisation (CSIRO) Forestry and Forestry Projects, FORTECH and the Queensland Forestry Research Institute (QFRI) manage the SPRIG project in Australia.

The vegetative propagation component of SPRIG, being managed by QFRI, aims to identify important tree species for which vegetative propagation would be an effective conservation and/or domestication technique. This work has involved: researching the vegetative propagation capacity of a number of species; the development of low-technology mist propagation facilities suitable for use in remote locations; and the provision of formal and in-country training in vegetative propagation.

Species

The following five top priority species were selected for more intensive vegetative propagation studies under the SPRIG project:

- *Swietenia macrophylla* (big-leaf mahogany)
- *Endospermum medullosum* (whitewood)
- *Santalum* spp. (sandalwood)
- *Toona ciliata* (red cedar)
- *Terminalia richii* (malili)

These species are briefly described below, including potential rationales for use of vegetative propagation.

Swietenia macrophylla

Big-leaf mahogany, native to Central and South America, is one of the world's premier tropical timber species, and is the subject of extensive plantings in Fiji and Samoa. Vegetative propagation could be used with this species to capture gains currently being made in breeding programmes through the propagation of superior families or individual clones.

Endospermum medullosum

This species is indigenous to Vanuatu and the Solomon Islands. The apparent wind-firmness and disease resistance of the species, and the high value of its light coloured timber, makes it a promising candidate for wider establishment in commercial plantations.

Vegetative propagation of whitewood has potential as a means of overcoming seed storage problems or as a method of delivering increased selection gains to the plantations.

Santalum spp

Three sandalwood species included in this project are *Santalum yasi* (Vanuatu, Fiji and Tonga), *S. austrocaledonicum* (Vanuatu, New Caledonia) and *S. album* (India, Indonesia and Australia). All three species are valued for their aromatic wood from which oil can be extracted. Both *S. yasi* and *S. austrocaledonicum* are rare in their natural environments, and improved seed of *S. album* can be difficult to obtain. Vegetative propagation could be used with these species for conservation purposes or to propagate individuals or families with superior properties commercially.

Toona ciliata

Red cedar is a high value timber species native to eastern Australia. In recent years it has been widely planted in Tonga and Samoa, where its growth and form are not affected by the cedar tip moth/mahogany shoot borer (*Hypsipyla robusta*). Although it displays good growth, this species has demonstrated poor wind-firmness in Samoa and Tonga when exposed to cyclonic conditions. Vegetative propagation technologies could possibly be used with this species to propagate superior tip-moth or wind-resistant genotypes, or to capture gains for other commercial traits such as straightness or vigour.

Terminalia richii

Malili is a species native to Samoa. This species has been recommended for use in Samoa in recent years due to the good wind-firmness demonstrated in two extreme cyclonic events experienced in the early 1990s. The only limitation to the wider use of Malili in experimental or operational plantings is its poor flowering and poor germination success in the nursery. Vegetative propagation technology could be used with Malili to 'amplify' the limited amount of available seed for conservation purposes, or to provide continuity of stock supply from year-to-year for commercial plantation establishment.

Research

Good progress has been made to date on the development/refinement of propagation strategies and techniques for all five species. Research objectives for *S. macrophylla*, *E. medullosum* and *T. cilata* have primarily focussed on the refinement of existing propagation techniques and the integration of these technologies into conservation and domestication strategies. Success rates of over 70 per cent have been achieved for all three of these species under the SPRIG project.

Success rates of over 60 per cent have also been achieved for *T. richii* and *S. austrocaledonicum;* species never previously propagated by cuttings. Work is ongoing with the development of propagation protocols for *S. yasi* and *S. album*, species known to be difficult to propagate vegetatively.

Development

A key outcome from the vegetative propagation component of SPRIG has been development of the 'porta-propagator', a portable battery-operated mist propagation facility designed for use in situations where constant electricity supply and/or water pressure is not available. Integral to the operation of the porta-propagator is a commercially available 'leaf balance sensor' which is used to activiate a high pressure pump powered by a 12 volt car battery. This system can be easily calibrated to provide the optimal misting regime for each particular species. The 12 volt battery can be recharged every two to three weeks with a battery charger, or be constantly recharged using a solar panel.

Porta-propagators have now been successfully established in Tonga, Vanuatu, Samoa and the Solomon Islands. This technology has also been adapted for use in Fiji on a larger scale.

Training

During November 1997, the QFRI conducted the 1st SPRIG Training Course on Vegetative Propagation of Tropical Forest Tree Species. The objective of this four-week training course was to provide key personnel in the South Pacific region with applied training in the rationale, techniques and strategies required for effective use of vegetative propagation with forest tree species.

QFRI recently conducted the 2nd SPRIG Training Course on Vegetative Propagation of Tropical Forest Tree Species, in Australia and Fiji, during November 1998. The objective of this second four-week training course was to conduct more of a 'train-the-trainer' type programme, with the Fiji component of the training course being structured to allow the participants to organise and conduct a one-day training course on vegetative propagation in a Pacific Island country environment.

A number of other individual and group training activities have been conducted in each of the SPRIG focus countries. Two further three-week training courses on vegetative propagation will be conducted by the QFRI during March and October 2000. ■

Improving Statistical Capacity and Reporting

A summary of ITTO's efforts to improve member countries' statistical capability and to coordinate statistical data collection and dissemination with other international organisations

By Steven Johnson and Jairo Castaño

ITTO Secretariat, Yokohama, Japan

It is difficult to find a report on almost any aspect of forestry in the developing world that does not bemoan the lack of reliable statistics on forest resources, production and/or trade as a serious impediment to forest management and policy-making. Complaints about the quality of forestry statistics are not new; in fact one of the reasons that ITTO came into existence was to attempt to provide better information on the tropical timber sector. However, since the UNCED summit in 1992, and with the follow-up IPF and IFF processes, the calls for improvement have become increasingly frequent, corresponding to the widening range of policy issues facing forestry decision-makers.

Unfortunately, the resources devoted to improving forestry statistics at the national and international levels have not kept pace with the demands for improvement, and in most cases remain a minuscule part of total forestry budgets. For example, only about ten per cent of the US$160 million worth of projects that ITTO has funded since 1987 have been in the field of Economic Information, and less than three-quarters of these have been field projects designed to improve statistical infrastructure in member countries. The relatively low priority given to statistical development projects is due to a number of factors, including the need in many countries to focus first on securing their resource base, and, amongst donor countries, the desire to direct funds to projects focusing more explicitly on forest management and conservation. Nonetheless, while the absolute level of its support for statistical projects has been relatively small, ITTO has made some important strides in several member countries towards improving statistical capability.

ITTO Statistical Development Projects

As of mid-1999, ITTO has completed statistical capacity development projects or pre-projects in Brazil, China, Congo-Brazzaville, Gabon, Ghana, Malaysia, Peru and the Philippines. Brief summaries of two of these are provided in Boxes 1 and 2. Statistical development projects are currently on-going in Bolivia, China, Colombia, Ecuador, Fiji, Panama and Peru, while approved projects for Egypt, Gabon, Guyana and Honduras are awaiting funding.

While each of these projects is uniquely tailored to the situation in the submitting country, there are many common elements. All involve an assessment of the current status of forestry statistics work in the country, often as a pre-project, which precedes the main project designed to address deficiencies identified. This usually involves the development of new data collection procedures, computerisation/database development, establishment of regional data collection nodes which transmit data to a central headquarters location either electronically or manually, and extensive training of project staff. Many countries are now including the development and incorporation of geographic information systems in statistical development projects (see Boxes) in order to improve the analysis and presentation of newly available data.

A technical working group was convened by ITTO in 1996 to review all of ITTO's statistical functions, including project work, and one of the outputs of the group was the formulation of guidelines for the preparation of statistical development projects. These guidelines have led to improved statistical development project proposals and have given the Expert Panel for the Technical Appraisal of Project Proposals a useful tool to assist their evaluation of such proposals.

Enhanced International Cooperation

With an increasing number of well-formulated statistical development project proposals under implementation, it is expected that the quality of data available from at least some ITTO member countries will begin to improve. The projects already completed have led to better, more timely statistical reports from several countries and have provided useful contacts for follow-up requests and queries. However, since many countries provide data to more than one international organisation and since these organisations often have different contact points in their member countries, the potential for confusion and errors is still substantial, regardless of the quality of national statistics.

A recent initiative by ITTO, FAO, the Economic Commission for Europe (ECE) and the EU aims to alleviate such problems. All of these organisations have a responsibility to

Box 1: Improving Forest Statistics in Gabon

Revenue from Gabon's forestry sector ranks second out of the country's total exports, and the sector is the biggest generator of employment. But despite a large supply of high quality timber, at the start of this decade the forestry sector was not seen to be fulfilling its potential role in contributing to the nation's socio-economic development. In order to improve the management of the country's forest resources, it was deemed essential to have up-to-date and reliable information on which a sound forest policy framework could be based.

In 1993, therefore, DIARF (Direction des Inventaires et des Aménagements et de la regeneration des forêts) began implementation of the ITTO project 'Collection and Computer Processing of Forest Statistics with a View to Improving the Management of the Forest Resources of Gabon' (PD 36/92). The aim of the project was to establish a computerised system to collect, process and analyse data on Gabon's forest activities in the areas of forest management, utilisation, silviculture, and timber processing activities and markets. In recognition of the similar problems of forest data availability in neighbouring countries, the system was to be devised in such a way that it might serve as a model to be adapted for use elsewhere, thus encouraging harmonisation of forest data management in the sub-region.

Following the production of detailed reports on the forest situation in Gabon and in the sub-region, basic computer hardware and software equipment was acquired for the project. Parameters for the collection and analysis of forest data were identified, and the computer system (STATFOR) for processing this information was established, based on Microsoft Access software.

The system is now fully operational and several members of the DIARF staff have been trained in its use. Internal management in DIARF has been improved, as has communication with the Ministry of Water, Forests and Afforestation. A subregional seminar was held to introduce the STATFOR database system to representatives of other countries; the Congo-Brazzaville and Cameroon delegations showed particular interest in seeing a similar system established in their own countries. Other project outputs include annual statistical reports, and STATFOR manuals and technical documents.

Three elements of the project are considered to have been key to its success: the detailed analysis of the existing situation in Gabon and the sub-region; the thorough training of project personnel; and the active participation of local members of DIARF with the consultants who designed, developed and implemented the system.

In less than two years, Gabon switched from a completely manual process for forest data collection and analysis to a sophisticated forest data management system. The wide focus of the project activities beyond Gabon, however, has also served to promote awareness among the different authorities of the sub-region of the importance of forest statistics for effective forest management. Project activities have since continued under a follow-up project 'Reinforcement of the National System for the Collection and Processing of Forest Statistics and Support for the Training of Field Units' (PD29/96), which focused on improving field level data collection and establishing a GIS system.

collect, analyse, organise and disseminate information on various aspects of the forest sector in their member countries. Several countries have requested that the four organisations carry out their information related mandate as efficiently as possible, and, in particular, seek synergies by collaborating on a joint forest sector questionnaire. Following meetings convened under the aegis of the Inter-Secretariat Working Group on Forest Statistics (IWGFS – a group consisting of representatives of the above four organisations plus OECD and others) in 1998–99, the joint questionnaire (JQ) was finalised and distributed globally for the first time in April/May 1999.

The philosophy behind the JQ is as follows:

- Joint core questionnaires collect information on removals, production and trade across the forest sector, from which each organisation can obtain the basic information it needs to serve its member countries.
- A number of supplementary but closely linked questionnaires address issues specific to one or more of the organisations. These are closely linked to the core questionnaires to ensure a consistent framework. In ITTO's case, supplementary data on trade flows, tropical species traded, socio-economic variables and current year projections are sought.
- Each organisation takes the lead in distributing the questionnaire to one group of countries, receiving the replies, undertaking necessary follow-up and maintaining close contact with the relevant national correspondents. ITTO is responsible for all of its producing member countries plus Japan.
- The information received is shared with other organisations of which the submitting country is a member, and analysed/disseminated according to the existing mandate of each organisation.

The benefits of this approach (which has been adopted for common members of ECE, FAO and the EU since 1995) include:

- Significant time-saving by all parties with no decrease in information collected.
- Respondent countries provide information to all four organisations, in a single questionnaire set, with a single set of definitions and a single conceptual framework.[1]
- Users of the information benefit from coherence and consistency of data between organisations.
- Organisations can benefit from each other's experience and contacts, and can concentrate their resources on validating data from a smaller group of countries.

All organisations have encouraged electronic submission of data by making spreadsheet versions of the JQ available on their respective websites, by email and/or on diskette. Statistical outputs will also be available in electronic format. As a key to successful data collection is a strong network of correspondents in member countries, the organisations will collaborate to improve statistical infrastructure where it is lacking, and to train statistical correspondents in all countries.

During development of the joint questionnaire, several other areas where enhanced collaboration/data collection would benefit all participating organisations and their members were identified, as follows:

- Prices. There is a need for more up-to-date interactive data, while ensuring that coverage of benchmark species/products used for constructing long-term price series is continued.

Box 2: Establishing a Forest Information System in Peru

Out of Peru's 67 million hectares (m ha) of natural tropical forest, about 40 m ha have production potential. With a target to incorporate this potential into the national economy by the 21st Century, the availability of reliable forestry data became strategically significant. The initiative to undertake the ITTO project 'Establishment and Operation of a Forest Strategic Information Center in Peru, CIEF' (PD 27/95) was therefore consistent with the country's interest in a national sustainable development programme for the new century.

Prior to the implementation of this project, the production of forest statistics was limited to secondary data sources and irregular reports prepared manually by the statistics bureaus of the various regional forest authorities. The proposed forest statistics system was defined as an information system aimed at the gathering, storage, processing and dissemination of relevant information from the Peruvian forest sector to support decision-makers in the field of sustainable forest development.

Implementation of the project by the National Institute for Natural Resources (INRENA) began at the end of 1996, with work focused in five regional centres. Operation of the statistics system was based on the establishment and performance of two complementary processes, the 'production' function, aimed at the creation of statistical information, and the 'planning' function, aimed at establishing an appropriate framework for the statistical information production process. The database developed, using Visual Fox Pro and ARC/INFO software, has one component for 'economic' statistics related to the forest sector (for variables such as forest area, production per species/product, transportation, volumes processed and traded) and a 'geographical' component for utilising digital information obtained from photographs and maps.

For the **economic** component, a 'forest value chain' model was selected as the basic structure for integrating forest statistics in the country. This model traces forest products from their source of origin, through the harvesting, transportation, processing, marketing and trade stages, by recording information at each one. This component of CIEF has been structured on the basis of three modules. The *data entry module* involves the entry of data on the variables identified as relevant to the forest value chain. This process is carried out by the five regional agrarian directorates (the agencies responsible for forest administration at the regional level). A network node has been installed at each of these directorates from where data is transferred by email to the central network node at the project headquarters in Lima. The *consistency module* detects errors in the data entry process and allows for checking against the source documentation and appropriate corrections. The *consultation module* enables the retrieval of information contained in the forest statistical database.

As a result of this database, comprehensive information, which was previously undocumented or widely dispersed, is now available on volumes and values of imports and exports of both wood and non-wood forest products. Table 1 shows an example of CIEF's outputs, in this case illustrating monthly monitoring of production volumes by species. *Chorisia* spp. (lupuna blanca) and *Swietenia macrophylla* (caoba) were the main species of log produced in Peru for the period given.

The **geographical** component of the system comprises a cartographic database which was initially conceived to generate information about land suitable for reforestation in the southern highlands of Peru. Focus has been on the use of an exotic species, *Eucalyptus globulus,* for commercial purposes, and the native *Polylepsis* spp. for protection purposes. Native species adapt well to the prevalent conditions of the region, but their growth rate is so slow that they are only considered to have potential for protection plantations. A

Table 1: Monthly Production of Logs by Species (m^3) January-June 1998

Species	Jan	Feb	Mar	Apr	May	Jun	Total
Chorisia spp.	7,984	7,980	9,028	7,922	9,182	7,865	49,961
Swietenia macrophylla	1,894	6,007	7,375	15,916	4,144	3,207	38,543
Virola spp.	2,059	2,492	2,784	3,567	406	3,278	14,586
Cedrela odorata	1,860	1,780	2,261	3,653	1,989	1,678	13,221
Copaifera spp.	1,122	2,061	1,333	1,852	796	655	7,819
Others	2,313	3,614	3,103	7,389	2,243	2,862	21,524
Total	**17,232**	**23,934**	**25,884**	**40,299**	**18,760**	**19,545**	**145,654**

- Industrial structure. Detailed studies of particular sectors (e.g. wood based panels, tropical sawmilling) should be carried out periodically.
- Secondary processed wood products (SPWP). There is a need for the organisations to agree on definitions of products to be tracked and measurement units to be used. Following an initial study to ascertain these and current levels of production and trade, it would be useful for such statistics to be collected annually due to the increasing importance of SPWP in many countries' forest sectors.
- Sources of industrial fibre and wood fuel. The organisations should undertake studies to determine from where wood fibre and fuel are being supplied (e.g. plantations *vs* natural/semi-natural forests, non-forest land, etc.).
- Conversion factors. The organisations should work with member countries to review and update forest products sector conversion factors (e.g. weight/area to solid volume, roundwood equivalent factors, etc.).
- Undocumented production and trade. The organisations should review the current situation regarding any undocumented forestry activities relating to their objectives. This could include an examination and comparison of bilateral trade flows as well as better estimates of small-scale and informal processing.
- Revision of paper and paperboard categories. These categories should be reviewed and revised to better reflect industry practice and the actual customs classifications in use.
- Forest management data. The organisations should collaborate in data collection efforts for the FAO Forest Resource Assessments and in general dissemination of forest management data of relevance to their members.

The IWGFS will review this list periodically and undertake activities as deemed appropriate by member states of the participating organisations.

Conclusion

Reliable and timely statistics are the cornerstone of sustainable forest management. ITTO will continue to play a lead role in assisting its developing country members to strengthen

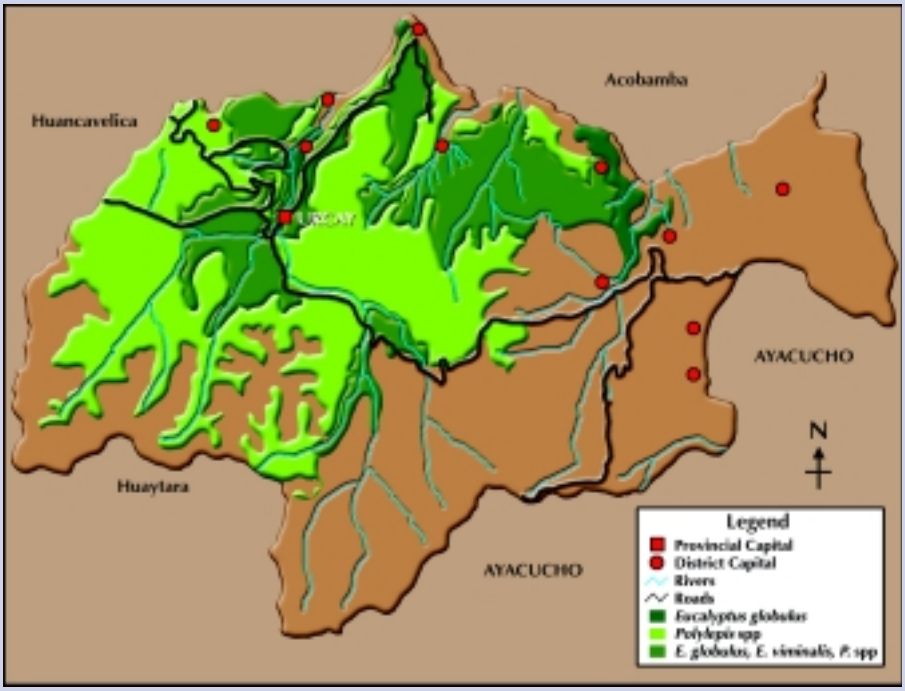

Figure 1: Map Indicating Land Suitable for Reforestation in the Province of Angaraes, Department of Huancavelica

Geographic Information System (GIS) was designed to integrate information from Lansat satellite photos and national maps with the digital information held by the database. The GIS produces overlapping thematic maps illustrating each of the following aspects: land use capacity, ecology, soils, vegetation and current land use, gradient, geology, hydrography, roads, and population centres (see Figure 1). The variables from the economic component can also be overlaid on these maps to identify, for example, the location of land suitable for reforestation with *Eucalyptus* in relation to established processing centres.

With these two complementary components, a forest statistics system has been established in Peru to meet the information requirements of not only national and foreign investors, but also of the increasing number of individuals and agencies involved with forestry issues. The project is now being continued in a second phase that aims to extend the present system eventually to cover the whole of the country.

their forest sector statistical systems, and to ensure that the data provided by these countries reaches users in a consistent and timely fashion.

[1] The number of questionnaires to be filled in will also be reduced. For example, until 1995 a country which was a member of FAO, ECE, EU and ITTO would have had to fill in three questionnaires containing over 20 separate data forms from the various organisations. With the JQ, the number falls to a maximum of ten, all to be filled in simultaneously, coordinated by a single correspondent.

Reports on many of the projects/activities referred to are available from the ITTO Secretariat (Information Officer). ■

Country Profile: Suriname

By Catriona Prebble

Suriname became ITTO's eighth South American member country in 1998. It is located on the continent's north-east coast, bordered to its west by Guyana, to the east by French Guiana and to the south by Brazil. It has a total area of 16.4 million hectares (m ha) with a population of only around 430,000 (Planning Bureau). Suriname gained independence in 1975, having previously been a Dutch colony (Dutch Guiana). Reflecting the nation's history, the people of Suriname comprise a racial mix of Creoles, Hindus, Maroons (descendants of slaves), Amerindians, Javanese, Chinese and Caucasians.

The country is dominated by its southern highlands which account for 80% of the land area. These form part of the Guyana Shield, a high rock formation which straddles Guyana, Suriname and French Guiana. Along the northern edge of the Shield lies the savanna belt, beyond which is the narrow swampy coastal plain where 90 per cent of the population is concentrated, particularly in and around the capital, Paramaribo.

Suriname's main industry has traditionally been bauxite for the production of aluminium which, in 1980, accounted for over 80% of the country's total export value. Now other important industries include rice, bananas, fish and shrimps. Most economic activity takes place close to Paramaribo; people in the interior are mainly subsistence farmers. GDP per capita in 1997 was US$3,900 (Planning Bureau).

Forest Resources

In 1995, forest covered 14.8 m ha of Suriname's land area, dominated by natural evergreen forest. A narrow band of forest running south of the savanna belt is the main timber production area; further south the topography makes road construction expensive. Approximately 10,000 ha of swamp forest on the coastal plain are important for *Virola surinamensis* which is used for plywood. Around 50 timber species have commercial value but only 10–15 are commonly used.

The country's low population density has resulted in there being little damage to the forest by agricultural encroachment, even where logging roads have increased accessibility. The deforestation rate for 1995 was estimated at 0.1% (FAO 1999a). Apart from the Brokopondo dam, constructed to supply hydroelectric power to the aluminium industry, damage to the environment from bauxite mining has been relatively limited – the mining area is about 8,000 ha. However, there has been a recent escalation in gold-mining investment, which is causing conflict with local tribal communities on whose land the mining activities are taking place.

Forest Industry

Approximately 800,000 ha of forest land is under concession to 20 concessionaires; an additional 500,000 ha is under permit to tribal communities. Over 20% of log production is exported, as sawnwood to the Netherlands and UK, plywood to the Caribbean and roundwood to Asia (see Table 1). Suriname currently has 40 sawmills with installed annual capacities ranging from 1,000 to 60,000 m^3; only one company manufactures plywood. The country has no imports of primary timber products.

Table 1: Production and Exports (1000 m^3) and Export Value (US$1000) of Timber in Suriname, 1997

	Production	Exports	Value
Industrial roundwood	182	31	2953
Saw & veneer logs	181	31	-
Other industrial roundwood	1	0	-
Sawnwood	41	7	1800
Plywood	8	5	1932

Source: FAO 1999b

In the 1980s, the CELOS system – a polycyclic system for sustained timber production based on improved harvesting techniques and post-harvesting silvicultural treatments – was established in Suriname (IUCN 1996). However, the political upheavals experienced by the country and activities of guerilla groups during the 1980s disrupted the work of the Forest Service, as well as that of the timber industry, and logging was temporarily discontinued. Since peace was restored in 1992, the timber industry has gradually re-established itself and a new forest law has been introduced.

In 1993, three Pacific rim international timber companies applied for logging concessions in the south of the country, which would have opened an additional 25% of Suriname's forest area to logging. Strong lobbying by environmental groups persuaded the government not to grant licences, although 'exploratory' timber permits were issued to allow inventories and management plans to be made. The government has since put a moratorium on the granting of large concessions.

There is significant trade in non-timber forest products (NTFP), including wildlife, such as parrots and orchids; these are exported with the required CITES certificate. There is also potential for the further development of other NTFP, such as liana furniture.

Biodiversity and Conservation

Suriname's few roads mean that 75% of the forests are considered inaccessible and, with the interior of the country largely uninhabited, there is a rich flora and fauna. The forests are home to an estimated 674 birds, 200 mammals, 130 reptiles, 99 amphibians and 4,500 plants, making them extremely important for tropical forest conservation and also for bioprospecting.

The Central Suriname Nature Reserve (CSNR) was established in 1998. This is a conservation corridor linking three protected areas which together cover 1.6 m ha, forming one of the largest nature reserves in South America. Altogether Suriname has 13 nature reserves, one nature park and one multiple-use management area in existence which, including the CSNR, puts 12% of the country's land area under protection.

References ☛ page 27

The International Forestry Students Association

By Emmanuel Marfo

IFSA President

The International Forestry Students Association (IFSA) is an association of local and national organisations of students pursuing forestry or related programmes at the higher levels of education. The aims of IFSA are: (a) to enrich the formal education of forestry students world-wide while encouraging an understanding of cultural differences by providing opportunities for international exchange, and (b) to encourage the development of a global perspective on forestry and related subjects. Established in 1990, IFSA today has a membership of over 50 organisations from over 40 countries.

Activities

With its wide range of activities, the IFSA promotes an understanding of forestry problems from a global perspective with a view to equipping today's forestry students with the professional tools and knowledge required for the management and enhanced utilisation of the world's forest resources tomorrow.

The International Forestry Students Symposium (IFSS) is an annual meeting of forestry students from all over the world, hosted by an IFSA member country. It is intended that the symposium should provide a forum for interaction, education and the exchange of ideas, and focus discussion on pertinent forestry issues. The result of this programme to date has proved to change the scope of participants from a narrow perception to a global view of forestry issues with an enhanced interest in the forestry profession and conservation. The theme of this year's 27th IFSS is 'Forest History – the Link to Our Future'. *

IFSA organises exchange programmes throughout the year to offer individuals the opportunity to have practical training in various fields of forestry. Unfortunately, the demand for these programmes often exceeds the jobs available. IFSA is strongly appealing to wood-based industries, forestry and environmental NGOs, government agencies and all other forestry-related organisations to assist by providing places for job training and internships for forestry students.

The members of IFSA undertake various forestry projects; the most significant of which is the village concept project (VCP). The VCP is an intersectoral project comprising students from different disciplines, such as medicine, agriculture, anthropology, and forestry, working together with communities with a view to improving the socio-economic life of the local people in a way that is sustainable. IFSA has recently completed one VCP in Odupong-Ofaakor in Ghana in which the forestry sector established a community nursery, a woodlot and agroforestry demonstration plots and planted more than 8,000 trees in the village. Two other VCPs are currently ongoing in Zimbabwe and Mexico.

IFSA is also involved in other activities, such as student exchange weeks between members and forestry competitions and games, all of which provide a platform for interaction in an inspiring and friendly atmosphere.

IFSA is supported by or involved with the activities of CIFOR, EFI, FAO, IAAS, IMISO, IUFRO, and UNESCO[1]; it also has links with many individual honorary IFSA members from various universities and government ministries. Currently, IFSA is seeking further cooperation from the World Wide Fund for Nature International (WWF), the International Union for the Conservation of Nature (IUCN), as well as ITTO, for assistance particularly with practical training and internships, with the running of the IFSA headquarters, and generally for the campaign for the sustainable management of the world's forests.

Major challenges for the IFSA include widening its network to capture all forestry student groups in order to present a common front for forestry students around the world; and mobilising enough financial and material resources to establish a professional headquarters, to improve communications, to organise programmes effectively and to participate in higher education meetings.

World Forestry Initiatives – IFSA's Position

Many initiatives have evolved since the United Nations Conference on Environment and Development in 1992, all of which are aimed at working towards 'sustainable development'. It is unfortunate though that, as part of this effort, the involvement of students and youth has not been significant. Our argument is that, today's forestry students are tomorrow's forest managers, researchers and policy facilitators, and hence any initiative towards sustainable forest management that does not involve the participation of students is shortsighted and incomplete. After all, we have an inherent right as young foresters to have a say in shaping the future of our trade.

Therefore, whether it is ITTO's Year 2000 Objective to ensure that all internationally traded tropical timber comes from a sustainably managed source, or the WWF/IUCN challenge to halt and reverse the loss and degradation of forests by the year 2000, the successful achievement of these targets in the long run is dependent on a multiplicity of factors, one of which is the calibre of the 21st Century forester.

In conclusion, the forester of tomorrow needs exposure and a deep involvement in the development of strategies and programmes for sustainable management because technical forestry education is no longer enough to equip tomorrow's forester for the challenges facing forestry today, much less those of tomorrow. We perceive that, given the economic, political and social situations that will confront the world in the near future, there is a need for a forester who, apart from knowing how to calculate yield and prescribe an appropriate silvicultural system, is also socially active and appreciates the urgent need for conservation. The necessary exposure, knowledge and motivation can be largely obtained from the involvement of forestry students in forestry programmes and initiatives at local, national and international levels.

[1] Center for International Forestry Research, European Forest Institute, Food and Agriculture Organization of the United Nations, International Association of Agricultural Students, Intersectoral Meeting of International Student Organisations, International Union of Forestry Research Organizations, and the United Nations Educational, Scientific and Cultural Organization.

**For more information, please contact: IFSA Secretariat, Buesgenweg 2, 37077 Gottingen, Germany;* tel/fax 49–551 3796992; Email secretariat@ifsa.net; Homepage *www.ifsa.net*

Fellowship Report

A summary of research carried out under an ITTO Fellowship to evaluate the use of GIS for the planning of timber extraction in the eastern Amazon.

By Carlos M. Souza Jr.

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Over the past two decades, logging activity has spread widely in the Amazon. According to a survey conducted by IMAZON researchers in 1997–1998, there are 75 sawmill centres in operation in the Brazilian Amazon. Despite the potential economic and social advantages of planned forest management, logging has been practised in an unplanned fashion, causing serious environmental impacts. Several studies have shown that logging increases fire risk, causes soil compaction and tree damage, increases the risk of tree species extinction, contributes to carbon emission, and catalyses deforestation.

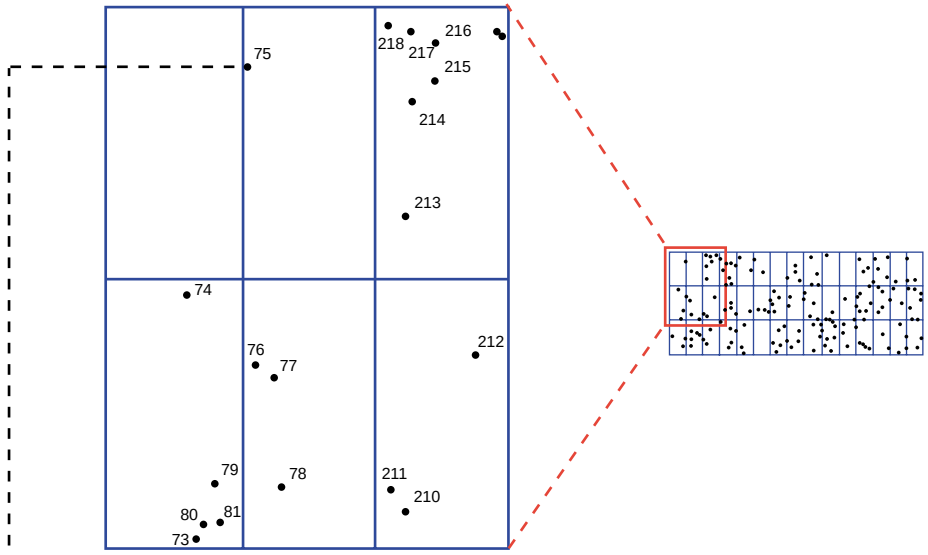
IMAZON's studies have shown that by applying forest management techniques the timber harvest cycle might be reduced from 90 years (unplanned extraction) to 30–40 years (planned extraction), and logging impacts can be reduced drastically as well. The profit margin in the planned operation also increases because of a significant reduction in log waste. However, to be effective, forest management requires information. This information includes data acquired during field inventories (i.e., tree location, species, tree quality, height and diameter, etc.) and data derived from the analysis of primary field data (felling angle, tree species distribution, road maps, etc.).

The inventoried area ends up generating a large database that has both spatial (i.e., tree *x* and *y* coordinates) and tree descriptive information. This data needs to be input, stored, manipulated, analysed and retrieved in order to help in the planning of logging operations. These characteristics of the inventory database make the Geographic Information System (GIS) an appropriate tool to assist in such work. This research, carried out with the assistance of an ITTO Fellowship, investigated the potential of GIS application for the planning of timber extraction in the Brazilian Amazon, and evaluated the cost and time required to generate and to analyse maps with and without GIS.

Study Area

A total of 105 ha of forest located in Paragominas municipality, eastern Amazon,

Figure 1: GIS Database Built for the Planning of Logging Activity at Fazenda Agrosete, Paragominas, Brazil.



Tree ID	Tree #	Species[1]	Line	DBH	Bole Quality	Crown Shape	Vine Density
73	73	Murure	1	62	Bad	Complete	Without vine
74	74	Tachi Preto	1	51	Good	Complete	High density
75	75	Jatoba	2	56	Good	Complete	High density
76	76	Jatoba	2	60	Good	Complete	Low density
77	77	Timborana	2	100	Reasonable	Complete	High density
78	78	Faveiras	2	52	Good	Complete	High density
79	79	Tachi Branco	1	65	Reasonable	Complete	Low density
80	80	Tacacazeira	1	58	Good	Complete	High density
81	81	Guajara Preto	1	53	Good	Half Crown	High density

[1] **Species names:** Murure (*Brosimum obovata*), Tachi Preto (*Tachigalia myrmecophilla*), Jatoba (*Mymenaea courbaril*), Timborana (*Newtonia suaveolents*), Faveiras (*Parkia nitida*), Tachi Branco (*Tachigalia alba*), Tacacazeira (*Sterculia pilosa*), Guajara Preto (*Neoxylthece robusta*).

Table 1: GIS Applications Identified in the Pre-logging and Post-logging Phases.

GIS Application	Characteristics	GIS Products
Pre-logging		
Inventory	Provides data to build the GIS database	data storage, manipulation, update and retrieval
Map Generation	Uses location and conditional spatial query and analytical capability of GIS to generate maps for logging planning	**location maps:** harvestable trees map, directional felling map **conditional maps:** road and skid trail map, vine cutting map
Post-logging		
Stand Management	Uses GIS spatial analytical tools to estimate forest's future composition	thinning tree growth monitoring forest damage assessment forest structure evaluation

have been used as a laboratory for IMAZON's studies on planned timber extraction. Tree locations were recorded in terms of *x* and *y* coordinates. All trees with commercial value and dbh greater than 25 cm were mapped. The following data were collected for each mapped tree: location, species, dbh, height, bole quality, crown quality, felling direction, vine occurrence, and light condition. A more detailed inventory was performed in a subset (24.5 ha) to be used as a control area for post-logging regeneration studies (see Figure 1). In this subset, all existing trees were mapped and dbh measurements have been taken since 1995 to monitor tree growth. GIS applications were identified for the pre- and post-logging phases. The logging phase itself was excluded because it makes use of the GIS products (i.e., maps and reports) generated in the pre-logging phase (Table 1).

Is GIS Economically Feasible?

To determine whether GIS is or is not economically feasible for timber extraction purposes, the cost and time required to conduct logging management with and without GIS were considered. The comparison was made for the three manual maps (base map, extraction map, and cutting and skidding map) that have been used in planned logging by the technicians from the Tropical Forest Foundation (TFF) in the Amazon. Despite the high initial investment (estimated cost US$14,000) in hardware, software and training, the results show that GIS-based projects are cheaper and faster than projects that use manual maps. The initial investment can be recovered through improved efficiency when the harvesting area is larger than 4,200 ha.

There are other qualitative advantages of using GIS for planned logging that were not considered in economic terms. According to local forest technicians involved with planned logging, scaling is one of the hardest problems with using manual maps, since any necessary change in scale requires a new map to be generated. GIS handles scaling easily and allows users to create maps in any paper size. Map storage is another disadvantage of manual maps, because paper starts to deteriorate after one year due to the high humidity of the Amazon region. The digital maps produced with GIS have an indefinite lifetime, which depends only on the appropriate use of backups. Another difficulty of manual maps is associated with data retrieval. If a specific tree species needs to be located on the map, first it has to be identified in the spreadsheet database and then located and assigned individually on the map. This is a time-consuming task that is overcome by the GIS spatial query capability. Finally, GIS provides area and distance measurement tools that are faster and more accurate than manual measurements.

Conclusions

The research illustrates that the use of GIS:

- facilitates the manipulation and retrieval of large databases;
- generates maps and reports more quickly and cheaply than manual methods;
- enables more accurate measurements of distance and area to be made;
- helps to overcome scaling and data storage problems encountered with manual maps;
- allows recovery of investments in training and hardware within a year for areas larger than 4,200 ha. ■

ITTO Fellowships

ITTO offers fellowships to promote human resource development and institutional strengthening in the forestry sectors of member countries. The priority areas are: Forest Industry; Economic Information and Market Intelligence; and Reforestation and Forest Management. Fellowship funds are provided for the following activities: (1) study tours to forests, mills and research institutions; (2) participation in conferences, workshops and training courses; (3) postgraduate programmes (partial tuition grants), not including PhDs; (4) short-term research; (5) technology transfer to producer member countries; and (6) preparation of technical documents.

Applications are required to conform to ITTO's general objectives in respect of sustainable forest management, utilisation and trade and, in particular, the Year 2000 Objective. The average award is US$6,500 with a maximum of US$12,000. Only nationals of ITTO member countries are eligible to apply.

The Fellowship Selection Committee appraises applications at the ITTO Council Sessions in May and November each year. Applicants are advised that fellowship activities may not commence until at least one month after the relevant Council Session. The next deadline for applications is **1 September 1999**.

Further details and application forms (in English, French or Spanish) are available from Dr Chisato Aoki, Fellowship Programme, ITTO; Fax 81-45-223 1111; Email itto@mail.itto-unet.ocn.ne.jp (see page 31 for ITTO address).

Copies of Fellowship Reports are also available from the Secretariat.

Current Literature

Dallmeier, F, and Comiskey, J A. (eds). 1998.* Forest Biodiversity Research, Monitoring and Modeling: Conceptual Background and Old World Case Studies. *Man and the Biosphere Series, Vol 20. Parthenon Publishing, Carnforth. ISBN 1-85070-963-7. Price: £58.00 / US$95.00.

Available from: Parthenon Publishing, Casterton Hall, Carnforth, Lancs LA6 2LA, UK; Fax 44–15242 71587.

Review by Nick Mawdsley

Sustainable forest management puts an obligation on forest managers to evaluate and mitigate the negative impacts of forest resource use on forest biodiversity. Through numerous international agreements and fora, governments around the world have voiced their support for such a goal. Yet despite the rhetoric, few countries have the research and monitoring systems in place to truly monitor and manage change in forest biodiversity. Indeed, in many parts of the world we remain ignorant of the magnitude, distribution and trends in forest biodiversity in all but very general terms.

Research, monitoring and modeling can all play key roles to remedy this situation by providing the information required for biodiversity management as part of the sustainable management of natural forests. These three themes are brought together in Volume 20 of the Man and the Biosphere Series which presents the results of a workshop held in Washington DC in 1995 aimed at reviewing progress in plot-based forest biodiversity monitoring in the Old World.

This 600+ page book is organised (somewhat awkwardly) into two sections that focus on (i) the framework for monitoring, and (ii) monitoring and modeling forest biodiversity, followed by three sections that provide examples from Europe, Africa and the Asia/Pacific region respectively. The papers are impressive in geographical scope and provide examples of forest monitoring from more than 20 countries, ranging from local, watershed (Slaughter *et al.*) to global scales (Ashton), using both remote sensing and data from permanent sample plots (PSPs).

The book will appeal to those with an interest in tropical forest biodiversity, although the final three sections are dominated by chapters that present descriptions of the structure and floristic composition of various forests. Anyone considering developing a biodiversity monitoring system should read the initial chapter by the book's editors (Dallmeier & Comiskey), which provides an excellent discussion of a generic framework for multi-taxa forest biodiversity monitoring and management as developed by the Smithsonian Institute / Man and the Biosphere Biological Diversity Programme. The chapter covers key issues such as participation by individuals and institutions, indicators, data standards, time frames, the importance of differentiating natural from human-induced variability and the need to integrate monitoring of such information into an adaptive management system.

The second scene-setting chapter (Hubbell) focuses on alternative theories for the maintenance of tree species diversity in tropical forests. The conclusion that both niche theories and dispersal limitation are important in determining tree diversity in the 50 ha plot in Barro Colorado, and the probable importance of mortality in the understorey through fungal pathogens and insect and mammal seed predators, underlies the difficulties in predicting the indirect impacts of various human activities in forests, such as hunting through to logging. The variation in seed dispersal modes in different forest in different locations (Mistry) further emphasises that processes influencing dispersal, diversity and forest composition will vary greatly between forests, making generalisations on the impacts of management difficult to establish.

The second section on monitoring and modeling considers a range of methodological issues ranging from measuring diversity and statistical and experimental design problems of developing biodiversity monitoring systems (Chadzon *et al.*; Condit *et al.*; Hall *et al.*; Hayek & Buzas; Margules *et al.*; Rice *et al.*; Stern;), through to the role and potential of remote sensing in monitoring and assessing forest biodiversity (Berroteran; Gerard *et al.*; Lobo & Gullison: Lund *et al.*; Solomon & Gove). Although there is much of interest here, the dearth of chapters in the rest of the book demonstrating successful biodiversity monitoring systems that are integrated into forest management suggests that there is a long way to go before management of forests in many parts of the Old World can be termed sustainable in terms of biodiversity management.

The central message of this book is simple: we need to integrate biodiversity into forestry planning and management. Yet despite all the excellent work described in this book, it is worth heeding the reminder of Burslem *et al.*, who point out that the success of a forest monitoring system is not so much dependent on pure science as on the commitment of the local forestry department. Basic research in support of forestry is vital, but the responsibility and ownership of data must lie with local institutions and scientists, not only for studying but also for managing forests. *Forest biodiversity research, monitoring and modeling* should act to inspire researchers and forest managers to look further into the mechanics of integrating biodiversity into forest management. If it does, it will have succeeded in its goal.

The next volume in the Man and the Biosphere Series has also now been published:

Dallmeier, F and Comiskey, J A (eds). 1998. Forest Biodiversity in North, Central and South America, and the Caribbean. Research and Monitoring. *Man and the Biosphere Series, Vol 21. Parthenon Publishing, Carnforth. ISBN 1-85070-964-5. Price: £58.00 / US$95.00. Available from the address given above.* ■

Recent Editions

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Available from: International Allelopathy Foundation, 10/67, CCS Haryana Agricultural University, Hisar 125 004, India; Fax 91–1662 38083.

Orstrom, E. 1999. *Self-governance and forest resources.* CIFOR Occasional Paper No. 20. Bogor. ISSN 054-9819.

Ruitenbeek, J, and Cartier, C. 1998. *Rational exploitations: Economic criteria and indicators for sustainable management of tropical forests.* CIFOR Occasional Paper No.17. Bogor. ISSN 0854-9818.

Both available from: Center for International Forestry Research, PO Box 6596 JKPWB, Jakarta 10065, Indonesia; Fax 62–251 622100; Email cifor@cgiar.org

Siyag, P R. 1999. *The afforestation manual: Technology and management.* Treecraft Communications, Jaipur. ISBN 81-901032-0-2. 632 pp. Price: Rs1450 / US$55.00 + postage.

Available from: Customer Services Department, TreeCraft Communications, 8A Kailashnagar, Jhotwara, Jaipur 302 012, India; Fax 91–747 320 70.

Country Profile: Suriname
continued from page 22

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Intergovernmental Forum on Forests – Third Session

3–14 May 1999
Geneva, Switzerland

Report by Amha bin Buang

ITTO Secretariat, Yokohama, Japan

Building upon the progress made at its previous sessions, the IFF undertook further consideration of its agenda at this third meeting. In accordance with its approved work schedule, the IFF conducted discussions on two programme elements under Category II which had undergone substantive consideration at its previous session but whose draft Co-Chairmen Reports were still heavily bracketed (i.e. text not agreed), namely Programme Element II(b) – Matters Left Pending on Trade and Environment, and Programme Element II(c) – Matters Left Pending on the Transfer of Environmentally Sound Technologies to Support Sustainable Forest Management. The substantive discussion at its previous session on two other programme elements, Programme Element I(a) – Promoting and Facilitating Implementation, and Programme Element II(e) – Forest-related Work of International and Regional Organizations, had already each yielded clean (unbracketed) Co-Chairmen Reports.

On Programme Element II(b), ITTO continued its role of lead agency and facilitator as assigned by the Inter-Agency Task Force on Forests (ITFF). Great efforts and attention were devoted to the continued negotiation of the Co-Chairmen Report on this element which took place in several sessions within a contact group. As a result, from a text that was bracketed in its entirety at the close of the Second Session, substantial progress was achieved in cleaning up the Co-Chairmen Report. And there was guarded optimism that the remaining bracketed parts might be cleared at the next and final session. Similar progress was made in respect of Programme Element II(c).

On account of its relatively less contentious nature, the text of the Co-Chairmen Report on Programme Element I(b) – Monitoring Progress in Implementation was duly considered and negotiated; only two bracketed parts of the report require further consideration.

Good progress was also achieved in respect of each of the eight specific items under Programme Element II(d) – Issues Arising From the Programme Elements of the IPF Process Needing Further Clarification, namely, (i) Underlying Causes of Deforestation and Forest Degradation; (ii) Traditional Forest-related Knowledge; (iii) Forest Conservation and Protected Areas; (iv) Forest Research; (v) Valuation of Forest Goods and Services; (vi) Economic Instruments, Tax Policies and Land Tenure; (vii) Future Supply of and Demand for Wood and Non-Wood Forest Products; and (viii) Assessment, Monitoring and Rehabilitation of Forest Cover in Environmentally Critical Areas. Many of the Co-Chairmen Reports on these items had been negotiated; the bracketed parts on the remaining items were at a manageable level and there is an even chance that all outstanding matters could be ironed out at the next session.

As expected, the substantive discussion on Programme Element II(a) – Matters Left Pending on the Need for Financial Resources drew much reference to well-known positions held by both developed and developing countries in the past. Not surprisingly, the Co-Chairmen Report on this element was heavily bracketed. This is clearly one of the more contentious issues that will still require tough negotiations by the IFF at its next session.

Further negotiations on Programme Element II(a) might prove difficult but these are not expected to overshadow the IFF consideration of Programme Element III – International Arrangements and Mechanisms to Promote the Management, Conservation and Sustainable Development of All Types of Forests. This is arguably the most contentious matter before the IFF as it deals with the sensitive issue regarding the possibility of negotiating a legally binding arrangement or mechanism for all types of forests. A lively debate on the subject was conducted in Plenary, which was followed by the distribution of the draft Co-Chairmen Report for consideration and negotiation. Although a contact group was set up for this purpose, the only tangible progress made was the placement of brackets in practically every paragraph of the draft report. Clearly, the delegates had made up their minds that the matter should be dealt with in depth at the next session, when parties would have the benefit of the outcome of the Costa Rica-Canada Initiative and the response to the IFF decision on guidance to its Secretariat in preparation for the Fourth Session.

Reactions to the achievements of the IFF at its Third Session were mixed. Negotiation fatigue and frustration were cited as the likely reasons for the holding of familiar past positions and the recycling of ideas and proposals. Yet, the progress made in respect of some programme elements, albeit restricted to those which were less contentious, was rather encouraging. The existence of heavily bracketed texts involving some of the more difficult programme elements was not unexpected as delegations continued to negotiate on the basis of an overall package. The Fourth Session of the IFF, which is expected to take place in New York from 31 January to 11 February 2000, will be the final opportunity for these outstanding matters to be resolved. ■

Topical and Tropical

Edited by Catriona Prebble

Conservation in Africa

At a Forest Summit in Cameroon in March, five African Heads of State – from Cameroon, Central African Republic, Congo-Brazzaville, Equatorial Guinea and Gabon – signed the 'Yaoundé Declaration' which outlines plans to create new cross-border protected forest areas in the Congo Basin. The initiative includes the establishment of a trans-border conservation initiative between Gabon, Cameroon and Congo-Brazzaville, protecting 3.5 million ha of forest; the endorsement of the existing one million ha tri-national network of protected areas between Cameroon, the Central African Republic and Congo-Brazzaville; and the creation of two new forest reserves in Cameroon. Despite economic difficulties and civil disturbances in the area in recent years, there is growing support for forest conservation amongst the governments and communities of some Central African countries. With large areas of forest still intact and relatively low levels of both deforestation and population pressure, the opportunity for forest protection is considerable.

In support of these new commitments to conserve Africa's forests, the Government of Cameroon announced the launch of a new trust fund to help finance the effective management of forest protected areas; an initial donation of US$500,000 was made by WWF. (*Excerpted from WWF press release, 16 March 1999)*.

WCFSD Report

The World Commission on Forests and Sustainable Development has released its final report following over two years of widespread consultations and public hearings across the globe. According to Ola Ullsten, one of the Commission's co-chairs, "Fixing the forest crisis is basically a matter of politics…It is about governments assuming their mandate to protect their natural resources – including forests – for the long term benefit of their citizens." The Commission highlights the need for community involvement in decision-making on forest issues and calls for the establishment of: (1) Forest Watch – a network connecting citizens with decision-makers; (2) a Forest Management Council – to standardise practices, including eco-labelling and certification; (3) a Forest Ombudsman – a network of officials to identify corruption, inequity and abuse in forest operations; and (4) a Forest Award – to recognise good performance in sustainable forest management.

The report also proposes the introduction of a Forest Capital Index, a measure which would take into account forests as the largest reservoir for plants and animals on land, their role in maintaining supplies of clean water, in protecting soil and contributing to the productivity of fisheries and agriculture and helping to regulate climate. The report recommends making better use of the vast areas of degraded land and, according to one Commission member, it specifies the reforms needed to resolve the forest crisis by calling for the abandonment of subsidies and tax incentives which provoke forest destruction, and for more openness in timber allocation procedures. (*Excerpted from WCFSD press release 19 April 1999*).

Pledges for the 21st Century

A hundred countries were represented at the second Ministerial Conference on Sustainable Forestry held 8–9 March in Rome by FAO. The session outlined a series of general criteria to be included in future international agreements designed to safeguard forests and prevent their destruction by fire. Reviews of forestry policy in a number of countries which suffer from a high incidence of forest fires were made; Mexico's Secretary of State for the Environment called for an international crusade to tackle forest fires and the use of slash-and-burn agriculture. The Rome Declaration on Forestry adopted by the Ministers pledges to pursue dialogue at the global level in order to coordinate future action on forests, improve the coordination of and step up the fight against forest fires, and promote sustainable forest management. (*Europe Environment*, 16 March 1999).

Protecting Local Interests

A joint venture between the Tropical Botanic Gardens and Research Institute (TBGRI) at Thiruvanthapuram and the Kani tribal group in India has been accepted by the United Nations Environment Programme as a global model for a project which recognises the intellectual property rights of local peoples. Since its identification in 1987, the project has been developing the potential of a rare, endangered plant found in the Agasthyar hills, the medicinal properties of which were revealed by Kani guides working with the investigating scientists. The drug which has since been isolated has proved to possess immuno-enhancing, anti-stress and anti-fatigue properties.

The pharmacy which is now producing the drug commercially is required to pay seed money to TBGRI, as well as a royalty on the ex-factory price of the drug in exchange for technology transfer and the right to manufacture the drug for seven years. The Institute itself is returning 50 per cent of the licence fee and royalty to the community whose knowledge first helped them to identify the plant. (*The Hindu*, 22 March 1999).

Importing Mahogany

The USDA Animal and Plant Inspection Service (APHIS) has recently released a manual, *Endangered Species Guidelines*, specifically addressing big-leaf mahogany (*Swietenia macrophylla*). This follows the decision last year by Costa Rica, Bolivia, Brazil and Mexico, for inclusion of this species on Appendix III of the Convention on International Trade in Endangered Species (CITES). The manual contains operational guidelines for the processing of documents for the import and re-export of mahogany and has been distributed to Plant Protection and Quarantine Inspectors of APHIS that are authorised to receive timber species listed under CITES with the aim of ensuring continued smooth trade in the species.

Requirements for importing big-leaf mahogany include that the shipment be accompanied by an original CITES export permit; mahogany from countries other than those listed above should be accompanied by an original certificate of origin, issued by the CITES Managing Authority of the country of origin. (*IWPA News*, March/April 1999). ■

Letter to the Editor

I would like to provide corrections to some statements in the article, 'International Market Access for Forest Products' by Ruddell, Stevens and Bourke in *TFU* Vol 9:1, in which several inaccurate references are made to the recently published ISO technical report ISO/TR 14061.

First, the article refers to the technical report as a set of "forest sector guidelines". In the ISO, the term 'guidelines' has a very specific, formal meaning, essentially implying a set of agreed elements that can be met, followed, or complied with. In fact, ISO/TR 14061 is simply a collection of (in the words of the report) "informative reference material" describing the variety of forest-related management and certification programmes that exist in the world, and explaining how forest organisations can use ISO's pre-existing 14001, a separate, generic, management-system standard that has no specific relation to forests.

The drafters of the ISO report spent months developing language to make this absolutely clear. Indeed, page 1 of the report states that ISO/TR 14061 "... does not propose any forestry-specific requirements... is not normative in any sense... does not establish performance levels for forest management... [and] cannot form the basis for environmental performance claims...". Thus, it should be quite apparent that the report does not contain guidelines of any kind, and cannot be complied with.

Given these caveats from the report itself, the following statement from the article seems all the more surprising: "Applying ISO/TR 14061... communicates a commitment to the practice of sustainable forest management...". Again, 14061 cannot be 'applied'; it can only be used as a reference. But more importantly, regardless of whether a forest management company references 14061 and/or actually applies 14001, the company is still free to make its own choice as to what standards it uses to manage its forests. And it can choose a standard that produces either 'sustainable forest management' (SFM) or *un*-sustainable management. It is seriously misleading, therefore, to suggest that a company should then make a claim in the marketplace that, no matter what level of forest management performance it produces on the ground, it automatically has "a commitment to" SFM. ISO's publication, *Publicizing Your ISO 9000 or ISO 14000 Certification* provides a further reminder that "ISO 14001 is not a label signifying a 'green' or 'environmentally friendly' product."

Confusion around these very same points already has led well-meaning companies to make serious public relations mistakes, and has created considerable controversy within and outside ISO relating to misleading and fraudulent advertising claims. The *TFU* would provide a great service to its readers by clearing up some of these misunderstandings.

William E Mankin

Director, Global Forest Policy Project
Washington DC
USA

Farewell to the Editor

ITTO bids farewell in this issue to Catriona Prebble, editor of the *TFU* since 1997. Catriona came to ITTO at an important point in the evolution of both the Organization and the global forest policy debate. This was illustrated by her first editorial, "Let Actions Speak", dealing with the outcome of the IPF process, the possibility of a global forest convention, and the role for ITTO in turning policy dialogue into field level actions. She continued to impress her colleagues in the Secretariat and readers of the *TFU* as well with insightful treatments of various topical issues in the months and years that have followed, including tropical plantations, downstream processing, women in forestry and non-timber forest products to name but a few.

Catriona made a special contribution to the *TFU* and ITTO in reporting more widely on the many project activities that the Organization is undertaking, often following in-person field visits to project sites throughout the tropics. She also made a major effort to rationalise and improve the distribution process of the *TFU*, helping to ensure that ITTO's best-known publication reaches the widest number of interested readers possible. Catriona worked especially hard in her last weeks at ITTO to ensure that Alastair Sarre, her predecessor and guest editor for the next issue of the *TFU*, would face no problems in returning to the editorial chair.

Catriona is returning to her home in the UK, and we will all miss her bright smile and sharp intellect here in the Secretariat. On behalf of ITTO and the many *TFU* readers you have served so well Catriona, farewell and good luck.

M Sobral
Officer-in-Charge

Making Contact

I would like to make contact with individuals working on non-timber forest products in West Kalimantan, Indonesia; other topics of interest: NGOs, social forestry programmes, and illegal logging.

Hayley Hendrickson, c/o Project Gunung Palung, Kotak Pos 1, Teluk Melano, Ketapang 78853, Kalbar, Indonesia.

I would like to make contact with people and/or businesses that are working on the theme of carbon trading and forests as carbon sinks. Preferred language: Spanish, or English.

Monica Dorado
Email mdorado@agro.uncor.edu
Foresdor@hotmail.com

Course Calendar

◆ **Local Level Management of Trees and Forests for Sustainable Land Use**

19 Sept–10 Dec 1999 Wageningen, the Netherlands

The course will explore the processes and methods to achieve collaboration under conditions of unequal power relations. Basic tools for decision-making, such as stakeholder analysis, conflict management, and impact assessment are examined. How to translate these tools into agreements between partners in the context of community forests will be considered.

Contact: Director of the International Agricultural Centre, PO Box 88, 6700 AB Wageningen, the Netherlands; Fax 31–317 418552; Email IAC@IAC.AGRO.NL

◆ **Environmental Assessment for a Rapidly Changing Planet**

1–26 November 1999 Canberra, Australia

This course aims to develop skills and examine techniques for environmental assessment and monitoring at the global, national and local levels. This is carried out by looking at a range of international treaties, national and local plans. Cost: AUD8,800

Contact: Jenny Clement, Training Manager, ANUTECH Development International, GPO Box 4, Canberra, ACT 2601, Australia; Fax 61–2 6249 5875; Email jenny.clement@anutech.com.au

◆ **Integrated Forestry Planning**

1 Nov–10 Dec 1999 Canberra, Australia

This course provides forest sector managers with the skills needed to foster participatory practices to help restore degraded land, protect water catchments and to ensure sustainable management; to recognise the value of local rural knowledge; to exploit the full potential of woodlots and plantations; and to develop knowledge of computer-based decision support systems for forest planning. Cost: AUD11,900. Contact as for course above.

◆ **The Tropical Agricultural Research and Education Center (CATIE) in Costa Rica offers the following two post-graduate programmes *in Spanish:***

January 2000

Two-year MSc courses in **Ecological Agriculture**, **Agroforestry Systems, Tropical Forestry and Biodiversity Management**, and **Environmental Economics**. The main orientation is to train participants in undertaking research activities, generating alternative technologies and promoting the sustainable management and conservation of natural resources under tropical ecosystems. The first year focuses on course work; the second is dedicated to thesis work, which may be carried out in the student's home country.

April 2000

PhD programmes in **Tropical Natural Resources Management** with emphasis in tropical forestry, agroforestry and agriculture. The programmes involve course work at both CATIE and cooperating universities in USA and/or Germany ***(in English/German)***, and field research carried out at CATIE's facilities or in other Latin American/Caribbean countries.

Contact: Office of Graduate Studies, CATIE 7170, Turrialba, Costa Rica; Fax 506–556 0914; Email posgrado@catie.ac.cr

◆ **MSc in Tropical Forestry**

September 2000 Wageningen, the Netherlands

This 17-month MSc programme is based around thesis research but includes two specialisations in Social Forestry, and Silviculture and Forest Ecology, which provide opportunities to focus on ecology, silvicultural systems based on natural regeneration, and timber production. Thesis research may be conducted within the framework of ongoing development projects in the country of the applicant. Deadline for applications for the 2000-2002 programme is ***15 November 1999***.

Contact: Sub-department of Forestry, Director MSc Programme Tropical Forestry, PO Box 342, 6700 AH Wageningen, the Netherlands; Fax 31–317 483542; Email frits.staudt@alg.bosb.wau.nl

Courses at the Training Center for Tropical Resources and Ecosystems Sustainability 1999

◆ **Participatory Techniques in Forestry and Natural Resources Development Projects**

24 Aug–4 Oct 1999 Cost: US$3,600

This course highlights the need to enhance participation of local communities in natural resources development projects. It illustrates methods of promoting participation, involving issues such as forest rehabilitation, biodiversity conservation, ecotourism, and wood energy.

◆ **Integrated Watershed Resources Management**

7 Sept–15 Nov 1999 Cost: US$5,300

The course introduces a broader understanding of the principles for integrated watershed resource management and conservation; it tackles watershed resource inventory, and the evaluation of environmental, financial and socio-economic impacts of watershed management, as well as the preparation of management plans.

◆ **Social Forestry for Sustainable Rural Development**

5 Oct–29 Nov 1999 Cost: US$4,400

The course examines the shift from regulatory to developmental forest management by promoting the active participation of rural communities. It assists development workers in implementing change to achieve sustainable rural development and resource conservation.

◆ **Silvicultural Practices and Wood Quality**

5 Oct–29 Nov 1999 Cost: US$4,400

This course enhances the production of quality wood through sound silvicultural practices; it assists foresters and managers of tree plantations to produce the desired wood properties in their tree crops.

◆ **Forestry Training and Education Development**

7 Sept–6 Dec 1999 Cost: US$6,400

Designed for teachers and school administrators, this course aims to improve skills in training and management of educational programmes and includes evaluation of teaching programmes and the development and use of educational resources.

Contact: Training Program Leader, Training Center for Tropical Resources and Ecosystem Sustainability, College of Forestry and Natural Resources, University of the Philippines Los Banos, PO Box 434, College, Laguna 4031, Philippines; Fax 63–49 536 3340; Email trees@laguna.net

ITTO Tropical Forest Update

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Other enquiries to ITTO, should be sent to the same postal address above or to the general ITTO Email address: itto@mail.itto-unet.ocn.ne.jp

The **ITTO Homepage** can be accessed at http://www.itto.or.jp

Forthcoming Forestry / Environment Meetings

◆ 28–30 June 99. **Forest Engineering for Tomorrow.** Edinburgh, Scotland. Contact: Geoff Freedman, Forestry Engineering, Greenside, Peebles, Scotland, UK; Fax 44–1721 723 448; Email geoff.freedman@forestry.gov.uk

◆ 11–16 July 99. **Forest Biotechnology: Into the Next Millennium**. Oxford, UK. Conatct: Malcolm Campbell, Department of Plant Sciences, University of Oxford, South Parks Road, Oxford OX1 3RB, UK; Fax 44–1865–275074; Email malcolm.campbell@plants.ox.ac.uk

◆ 12–16 July 99. **Off-forest Tree Resources of Africa Workshop.** Arusha, Tanzania. Contact: Prof Roger Malimbwi, Faculty of Forestry, Sokoine University of Agriculture, PO Box 3009 Chuo Kikuu, Morogoro, Tanzania; Fax 255–56–4648; forestry@sua.ac.tz

◆ 5–13 August 99. **Forestry Scenario Modelling in Risk Analysis and Management.** Joensuu, Finland. Contact: Brita Pajari, European Forest Institute, Torikatu 34, 80100 Joensuu, Finland; Fax 358–13 124 393; Email brita.pajari@efi.fi

◆ 13–14 August 99. **Women and Forestry.** Lillehammer, Norway. Contact: Bente Bjorkoy, TS Forum AS, PO Box 14, 2601 Lillehammer, Norway; Fax 47–61 28 73 20; Email lillarra@online.no

◆ 22–25 August 99. **International Conifer Conference.** Wye College, England. Contact: Lisa von Schlippe, The Royal Botanic Gardens, Kew, Richmond, Surrey, UK; Fax 44–181–332 5197; Email L.von.schlippe@rbgkew.org.uk

◆ 23–25 August 99. **International Teak Conference: Teak Beyond Year 2000.** Chiang Mai, Thailand. Contact: Director, Forest Tree Seed Centre, Muak-Lek, Saraburi, Thailand; Fax 66–36–341 859.

◆ 29 August–2 September 99. **Transformation of Plantation Forests.** Edinburgh, UK. (IUFRO). Contact: Esther Ker, Forestry Commission Northern Research Station, Bush Estate, Roslin, Midlothian EH25 9SY, Scotland, UK; Fax 44–131–445 5124; Email Esther.ker@forestry.gov.uk

◆ September 99. **New Approaches to Integrated Management of Primary and Secondary Forests for the 21st Century.** Belem, Brazil. Contact: Natalino Silva, Brazilian Agricultural Research Corporation, CP 48, CEP 66240, Belem, Para, Brazil; Fax 55–91–226 9845; Email natalino@cpatu.embrapa.br

◆ 1–7 September 99. **Sustainability of Plantations.** Curitiba, Brazil. Contact: Dr Carlos Ferreira, National Center of Forest Research, Curitiba, Brazil; Fax 55–41 766 1276; Email bellote@cnpf.embrapa.br

◆ 7 September 99. **Emerging Harvesting Issues in Technology Transition at the End of the Century.** Opatija, Croatia. (IUFRO). Contact: Stanislav Sever, University of Zagreb, Faculty of Forestry, Svetosimunska 25, H-1000 Zagreb, Croatia; Email dubravko.horvat@hrast.sumfak.hr

◆ 9 September 99. **The Full Value of Forests to Society.** Ittingen, Switzerland. Contact: Brita Pajari, European Forest Institute, Torikatu 34, 80100 Joensuu, Finland; Fax 358–13 124 393; Email brita.pajari@efi.fi

◆ 9-23 September 99. **27th International Forestry Students Symposium: Forest History - the link to our future.** Contact: IFSS 99 Organising Team, IFSA Secretariat, Buesgenweg 2, 37077 Gottingen, Germany; Fax 49 551 3796992; Email ifss@ifsa.net

◆ 12–19 September 99. **Forestry Education and Science in the Context of Environment and Development Problems: Strategies for the XXI Century** (IUFRO). Lviv, Ukraine. Contact: Yurij Tunytsya, Ukrainian State University of Forestry and Wood Technology, 103 Gen.Chuprynka str., UA-290057, Lviv, Ukraine; Fax 380–322 971765; Email edufor21@forest.lviv.ua

◆ 13–17 September 99. **Forest and Site Alterations due to Harvesting Operations: Agents, Impacts and Consequences.** Feldafing, Germany. (IUFRO). Dietmar Matthies, Lehrstuhl fur Arbeitswissenschaft und Angewandte Informatik, Am Hochanger 13, 85354 Freising, Germany; Fax 49–8161–714 767; Email mat@forst.uni-muenchen.de

◆ 15–19 September 99. **Wood Composite Products, Processes and Environmental Aspects.** Thessaloniki, Greece. (IUFRO). Contact: John Philippou, Conference Chairman, Aristotelian University, School of Forestry and Natural Environment, Section of Harvesting and Technology of Forest Products, 54006 Thessaloniki, Greece; Fax 30–31 998947; Email filippo@for.auth.gr

◆ 20–23 September 99. **Food and Forestry: Global Change and Global Challenges.** Reading, UK. Contact: John Ingram, NERC Centre for Ecology and Hydrology, GCTE Focus 3 Office, Crowmarsh Gifford, Wallingford, Oxon OX10 3BB, UK; Fax 44–1491 692313; Email j.ingram@ioh.ac.uk

◆ 20–24 September 99. **Forest Operations of Tomorrow.** Pessac, France. (IUFRO). Contact: Frits Staudt, Wageningen Agricultural University, Dept of Forestry, PO Box 342, 6700 AH Wageningen, The Netherlands; Fax 31–317–583542; Email frits.staudt@alg.bosb.wau.nl

◆ 22–25 September 99. **Landscape Futures**. Armidale, Australia. Contact: Dr David Brunckhorst, UNESCO Institute for Bioregional Resource Management, University of New England, Armidale NSW 2351, Australia; Fax 61–2–6773 2769; Email dbrunckh@metz.une.edu.au

◆ 26–28 September 99. **Environmental Marketing: Opportunities and Strategies for the Forest Products Industry.** Portland, Oregon, USA. Contact: Conference Assistant, Oregon State University, College of Forestry, 202 Peavy Hall, Corvallis, OR 97331-5707, USA; Fax 1–541 737 4966; Email hansenen@frl.orst.edu

◆ 28–30 September 99. **Interaction Between Nursery Management and Silvicultural Operations**. Auburn, Alabama, USA. Contact: Ken McNabb, Coordinator IUFRO Subject Group 3.02.00, School of Forestry, Auburn University, AL 36849–5418, USA; Fax 1–334–844 1044; Email mcnabb@auburn.forestry.edu

◆ 18–22 October 99. **Impact of Logging on Biodiversity.** Hanoi, Vietnam. Contact: Titiek Setyawati, Research Fellow, CIFOR, PO Box 6596, JKPWB Jakarta 10065, Indonesia; Fax 55–41 766 1276; Email t.setyawati@cgnet.com

◆ 18–23 October 99. **II Latin American Symposium on Advances in the Production of Forest Seeds.** Santo Domingo, Dominican Republic. Contact: Rodolfo Salazar, CATIE, Turrialba, Costa Rica; Fax 506–556 7766; Email rsalazar@catie.ac.cr

◆ 22–24 November 99. **Forestry and Forest Products Research – Tropical Forest Harvesting: New Technologies Examined.** Terengganu, Malaysia. Contact: The Secretariat, CFFPR Conference Series, Natural Forest Division, FRIM, Kepong, 52109 Kuala Lumpur, Malaysia; Fax 60-3-636- 7753; Email harvest@frim.gov.my

◆ 10–12 January 2000. **Geospatial Information in Agriculture and Forestry**. Florida, USA. Contact: El Conferences, PO Box 134008, Ann Arbor, MI 48113-4008, USA; Fax 1–734–994 5123.

◆ 7–12 August 2000. **XXI IUFRO World Congress.** Kuala Lumpur, Malaysia. Contact: XXI IUFRO World Congress Organising Committee, Forest Research Institute Malaysia, Kepong, 52109 Kuala Lumpur, Malaysia; Fax 60–3–6367753; Email iufroxxi@frim.gov.my

ITTO Calendar

◆ **21 June–9 July 99**. ITTO Training Workshop on Tropical Forestry and Timber Trade Statistics. **Curitiba, Brazil**

◆ **23–27 August 99**. 18th Expert Panel for Technical Appraisal of Project Proposals. **Yokohama, Japan.**

◆ **26–30 October 99.** IV Plywood and Tropical Timber International Congress (PD 40/99). **Belem, Brazil.** Contact: General Coordination WR, Rua Clovis de Oliveira, 86-Jd Guedala, 05616-130, Sao Paolo, Brazil; Fax 55-11-814 3116; Email wrsp@uol.com.br

◆ **1–6 November 99**. XXVII Session of the ITTC and Associated Sessions of the Committees. **Yokohama, Japan.**

◆ **November 99**. ITTO Training Workshop on Tropical Forestry and Timber Trade Statistics. **Cameroon**. (*Dates and place to be confirmed).*

◆ **24–30 May 2000.** XXVIII Session of the ITTC and Associated Sessions of the Committees. **Lima, Peru.**

◆ **30 October–4 November 2000.** XXIX Session of the ITTC and Associated Sessions of the Committees. **Yokohama, Japan.**