CFA Newsletter

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Contents:

CFA Newsletter
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A choice for China

On the road to the major logging town of Pian Ma, Yunnan Province, China (close to the Burma-China border); 2004. 'Illegal chopping and logging of wood is strictly prohibited'

"It's out of the question for China to satisfy its domestic demands by felling natural woods in the neighbouring countries – it never will."[i] **Lei Jiafu, Vice Head of the Chinese State Forestry Administration, January 2005**

China is now the world's second largest timber importer after Japan; both in total and of tropical timber (excluding Canadian exports to the US).[ii] In 2003, China imported 42 million m^3 RWE of timber; this excludes wood chips, pulp and paper. A growing economy,

[i] Agence France Presse, "China says deforestation still a major environmental problem"; 8 January 2005, from: http://www.terradaily.com/2005/050118102656.tgm9j244.html

[ii] GLOBAL TIMBER. ORG. UK., from: www.globaltimber.org.uk/china.htm

a reduction in domestic timber production and the progressive reduction in tariffs and non-tariff barriers to trade have all contributed to the increase in China's timber imports. Per capita consumption, although relatively low, is likely to rise as China's economy expands and the wealth of its citizens continues to increase. China is also a major exporter of timber and timber products, including wooden furniture, wood chips and paper to epsecially the US and Japan.

Total consumption, including production for re-export, will remain a large and ever increasing problem for the world's forests, so long as Chinese companies import their timber from largely illegal, unsustainable and destructive sources. In fact, most of China's timber imports originate from countries where illegal logging is rife. Global Witness has estimated that about 98% of Burma's timber exports to China are illegal (see below). The percentage of illegal exports to China from other countries is also high: Brazil 80%, Cameroon 50%, Congo (Brazzaville) 90%, Equatorial Guinea 90%, Gabon 70%, Indonesia 90%, Malaysia 60%, Papua New Guinea 70%, Russia 80% and the Solomon Islands 70%.[iii]

The destruction of northern Burma's frontier forests

In 1984 there were four logging companies based in the Chinese town of Pian Ma located on the China-Burma border. There are now over 100, despite the imposition of a logging ban in Yunnan Province in 1996 and a nationwide Chinese ban in 1998. The rapid expansion of the timber industry in Pian Ma, and many other towns along the China-Burma border, has been largely sustained by uncontrolled logging in Shan and Kachin State: a comparatively undeveloped region across the border in northern Burma.

Most of Burma's border regions were mired in conflict between the Burmese military government and armed ethnic opposition groups for more than four decades till ceasefires were agreed in the late 80s and early 90s. In this context, having supported armed ethnic opposition groups in the past, the Chinese government became a major ally of the military regime in the late 80s. The conflict in northern Burma was undermining the potential for development in China's border provinces, both by limiting the trade natural resources from Burma and by blocking access to a large market for goods manufactured in China.

However, the ceasefire deals do not address underlying political grievances of the armed ethnic opposition groups or natural resource management: this includes forest management – the Ministry of Forestry (MoF) plays little or no part in the management of forests in Kachin State. As a result, these forests are vulnerable to uncontrolled exploitation and destructive logging is widespread. From the outside logging in Kachin State appears chaotic, in part because it is controlled by several groups including the regime's Northern Command *Tatmadaw* (armed forces) units, and the ceasefire groups, the National Democratic Army Kachin (NDA(K)), and the Kachin Independence Army/Organisation (KIA/O). Chinese companies and others have taken advantage of the forest management vacuum, and are logging high conservation value forests

Customs check point on the China-Burma border

in northern Burma.

The cross-border timber trade is almost entirely illegal according to Burmese law. Global Witness researchers have seen timber being trucked into China at numerous locations, from Gongshan in the north to Ruili further south, despite the fact that there is only one legal export point on the border. Vast quantities of timber were seen stockpiled in towns all along the border, in particular Pian Ma and Houqiao. Indeed, Chinese customs data indicate that between 800,000 m^3 and 1,000,000 m^3 of timber was crossing this border annually throughout the same period. The Burmese Ministry of Forestry has informed Global Witness that only 18,000 m^3 of timber were legally exported across the Burma-China border in 2003-4, and that no teak nor softwood was exported legally. The discrepancy between these official figures indicates the amount of timber illegally exported from Burma. Almost all of this multi-million dollar trade is also illegal according to Chinese customs and quarantine laws. The trade has increased by 60% since 2001 when China along with a number of other nations signed the FLEG declaration in Bali aimed at combating illegal logging in the region.

The logging in northern is not simply illegal, it is also often highly destructive and it is not sustainable. Once the natural wealth of these border areas has been exhausted, any real prospect for sustainable development in northern Burma will have vanished. As the forests are depleted this may also lead to the disintegration of the timber processing industry on the Yunnan-Burma border and unemployment in this and other parts of China. Destructive logging in Burma, close to the China-Burma border, is likely to have adverse environmental imports, and may lead to forest management problems in China, including threats to the

[iii] GLOBAL TIMBER. ORG. UK., from: www.globaltimber.org.uk/ChinaIllegalImpExp.htm

internationally renowned Nujiang and Gaoligongshan reserves, for example through a potential increase in the incidence of forest fires.

Despite the clear economic advantages for China in the short term, however the nature of the ceasefire processes and logging in northern Burma might be storing up serious problems for both the SPDC and the Chinese authorities; not to mention the armed opposition groups and local people. Marginalisation of the people of northern Burma was in part responsible for the insurgency. However, the indigenous ethnic population of Burma's border areas still derive little if any benefit from the logging and more often than not are left poorer as a result. Lack of political progress together with gross mismanagement of the forest areas has also reduced rank and file support for the leadership of the armed opposition groups. This has already led to widespread discontent and renewed instability on the border with China, as these groups seek to regain popular support and struggle for control of the valuable forest areas that remain. In addition, the presence of many migrant workers in Kachin State and Yunnan Province has led to an increase in prostitution, HIV/AIDS, drug abuse, and gambling which has serious security implications for China.

Left unchecked, the destructive logging by Chinese companies in northern Burma, and the associated illegal cross-border timber trade, will ultimately undermine long-term economic development on both sides of the China-Burma border. Logging of this nature also poses a significant threat to the fragile stability of these sensitive border areas. It reflects badly on China's international image and the 'Green Olympics' in 2008 if China is seen to export its environmental problems. Ensuring the legality and sustainability of timber supplies should, therefore, be a strategic policy priority for Chinese central government and the authorities in Yunnan Province.

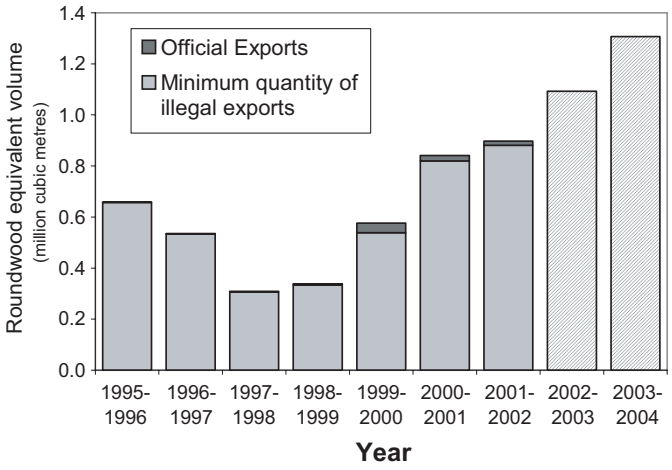
By taking action, the government of the People's Republic of China (PRC) can demonstrate that it takes its responsibility as a regional and global power seriously, and provide leadership for other timber importing countries, most importantly the G8, in relation to environmental protection, sustainable development and the fight against illegal logging.

Key findings

- In 2003-04, timber was the SPDC's third most important source of legal foreign exchange amounting to about US$377 million.
- By 2004-05, forest products were the SPDC's second most important source of legal foreign exchange, amounting to US$427.81 million and 15% of the total.

- In 2003-04, a minimum 1.3 million m^3 RWE of timber exports, almost two-thirds of the total, were illegal according to Burmese law.
- The vast majority of timber illegally exported from Burma is destined for China.
- The value of the timber illegally exported from Burma is equivalent *pro rata* to an import value of roughly US$300 million.

- In 2003, 96% of China's imports of logs and sawn wood from Burma entered China's Kunming customs district overland.
- In the same year, China recorded imports of 1.3 million m^3 RWE of timber from Burma; about 98% of this trade was illegal.
- The illegal cross-border timber trade has increased by almost 60% between 2001 and 2004.
- Large parts of forest along the China-Burma border have been destroyed, forcing the logging companies to move even deeper into Burma's forests in their search for timber.
- The destructive logging and illegal timber trade take place with the full knowledge and complicity of the SPDC, the Chinese authorities and ceasefire groups.



A comparison of Burmese timber exports to China as reported by Burma, and Burmese timber imports as reported by China: Million m^3 RWE[iv]

Notes:
1. Import data have been converted to give RWE volumes.
2. Minimum quantity of illegal exports equals total imports of Burmese wood into China (according to Chinese authorities) minus total exports to China according to the Burmese authorities.
3. The height of each column equals total imports of Burmese wood into China (according to Chinese authorities).
4. Source data for Burma's exports to China in 2002-03 and 2003-04 has not been accessed (it does not appear to have been published yet); the two columns at the right hand side of the chart are hatched to reflect both this.

Global Witness (www.globalwitness.org)
All photos by Global Witness

[iv] Sources: for Burma's declared exports to China - www.etrademyanmar.com/STATS/excelfile/P1005.xls, the annual yearbooks of statistics of Burma's Central Statistical Organisation: for China's declared imports from Burma - World Trade Atlas, China Customs Statistics Yearbook

Association News

Legacies and Donations

As part of our fund-raising strategy for the CFA I shall be writing to all CFA members to encourage them to leave a legacy to the CFA or to make a donation, especially to the Young Forester Award. Because of the relief offered to legacies and donations under the UK tax system, I started with CFA members who are resident in, or in some cases have strong links with, the UK

We are extremely grateful to those members who have generously contributed to the Young Forester Award fund. Those of you who have followed the diaries of this year's winners on our website will know about the excellent work they have carried out in Sri Lanka and Guyana, and the tremendous opportunity that the Young Forester Award has given them. Those of you who haven't can read Courtney Johnson's report below and see for yourselves the importance of the Award in training the next generation of foresters.

We received over £2 000 in donations and plan to offer the Award to two more young foresters next year; but we still need your help to achieve this aim. So, for those of you (whether UK-based or not) who haven't yet made a contribution to the Award Fund I urge you to think about supporting us in our objective of providing practical training opportunities to young foresters. Donations can be sent to the Technical Director at the address given on the front page.

Jim Ball

A Young Forester's view of Sri Lanka

I am still in shock. You know the type where you return from work or travel in a developing country and start to question your life choices? We have so much in Australia. How can people still be unhappy? As a CFA Young Forester Award recipient I was given the opportunity to work in Sri Lanka for two months during which time I was confronted every day with challenging situations; physically, socially and morally. I heard my share of 'tsunami stories' – some told in general conversation that make you wonder at the ability of humans to get by, others aimed at getting their piece of the tourist dollar. I yearned to be inconspicuous but being a tall, white female who dresses in pants and shirt and uses a hat rather than umbrella to shade from the scorching sun, meant that this was near impossible.

Courtney enjoys a break in the hill country

One of the few provisos of the programme was to limit making any comments that may have political connotations. To be honest, this was a difficult task when you observe the wider impacts that political decisions have on quality of life. This in turn dictates how the government undertakes forest management and therefore how the community cares for the environment. It seems that in the last 20 years there has been much progress in environmental education, but when people are just struggling to meet their basic needs, this is one of the first concerns overlooked.

The Kanneliya-Sinharaja biodiversity corridor project (in the south west of Sri Lanka), on which I was working, is still in the inception stage. The biodiversity corridor attempts to create a contiguous tract of forested land of minimum 100m width between the Sinharaja Forest Reserve and the Kanneliya Forest Complex. Whilst the purchase of land occurred some time ago, attention is still needed for housing improvements, involvement of the community and ecotourism marketing. I was pleased to see a good turnout for the first meeting of Rainforest Rescue International (RRI) with the community in the Hiniduma area. Already people could see how this would be of benefit to their lives and they wanted to know more.

The project initiated a baseline monitoring program to detect and quantify differences along a gradient of land use types. It aims to build an understanding of the differences in species, forest structure and soils and describe the change that occurs at these sites through time. Whilst some of the physical changes that accompany land conversion from natural rainforest to plantation or high input agriculture are obvious, there are still many questions

about the most appropriate method of restoration. The site is characterized as a mixture of secondary forest, rice, riverine and harvestable tea. It is clear that the forest has regenerated following abandonment and minimal ongoing disturbance. However, the achievement of a desirable species mix and the occurrence of regeneration on an appropriate time scale may require greater attention.

I was fortunate enough to observe a developed example of analogue forestry in the hill country. Planting was carried out in stages with attention to species selection within each layer of the forest. I observed cashews littering the forest floor awaiting harvest by a knowledgeable manager, tropical fish species skittering about the abandoned rice paddy, spice of all types and poisonous snakes. What struck me most about the visit was the calm afternoon swim in the local waterhole upstream of the demonstration forest. The hill country was picturesque, the temperature comfortable for the first time in two months and the hospitality sincere. Yet all larger vegetation was lacking in the riparian zone and the stream itself was suffering some sort of algae bloom that could be attributed to nitrogen and phosphorous runoff from the surrounding agriculture and cattle grazing. In the eyes of my hosts this was the norm as they could not remember a time when the stream had run clear.

Sri Lankan time exists in a strange vortex. Achieving small tasks which we take for granted, like getting to the market or posting a letter, can consume an entire day. I remember one of my first ventures from the guesthouse to buy supplies in town. I borrowed a bike from the neighbours and set off down the hill to brave the traffic for two kilometres into the town centre. I coasted approximately 400 m before I decided that I needed a new plan of attack. The gridlock of children leaving their school in various modes of transport, the chain persistently falling off (apparently I was not meant to use the gears on the bike) and the heat of the day had won over – I retreated to the guesthouse to devise a new plan of attack.

Lack of communication was also an issue. It meant that at times we would travel two and a half hours in the hope of meeting with community members or employees only to find that plans had changed. There was a funeral to attend, holy day celebrations or many weddings due to an auspicious alignment of the celestial bodies. Our only choice was to drink tea before reconsidering tomorrow's work schedule.

I met quite a few characters along the way that seemed to be able to maintain elevated energy levels in their respective fields whether it is orchid collection, bee keeping for honey production or growing plants in extreme conditions. I now know that you cannot call yourself a gardener or nursery manager unless you carry a pair of secateurs and a pocket knife on all occasions. I have committed to memory many tropical tree and plant characteristics for field identifications and begun to understand the delicate balances that exist in the tropical lowland forest.

The Young Forester Award is a great way for individuals with a commitment to working in the environmental field and sustainable forest management to experience another culture and get a better perspective on the forestry practise of their own country. Costs are minimal as the Commonwealth Forestry Association contributes funding for travel and some in-country expenses and the host organisation helps with living costs during the working week.

One of the best features of the program is that you can work with an organisation that has been established in the field for many years and is staffed local people. This is in contrast to placements with an international NGO, which may encounter issues in understanding local traditions and accessing the community. Programme strengths lie in the total immersion and the ability to connect with people for exchange of skills and ideas. I found that the extension officers at RRI possessed such enthusiasm for improving the general perception of the environment.

Whilst the language presented a considerable challenge to me, I was fortunate enough to work with people who spoke varying levels of English. I had spent some time with tapes and grammar books, getting my head around some of the basics prior to my departure. Unfortunately in many of my first attempts at communication, I found that although I believed I was sounding out the correct syllables I was too far from the local pronunciation to be understood. My thanks goes to Lalith who took the time to teach me the correct emphasis in exchange for improving his English (I'm not sure the tradeoff was exactly an equal one as he was much further along in his understanding of English).

Other preparations carried out in Australia involved intensive research and reading. Of course it is hard to know exactly what you will be doing in a job until you begin but the more the placement details are finalised the better you are able to target your learning and gain the most from your time overseas. As I discussed in my journal entries (www.cfa-international.org/courtney.html) I have learnt much about ArcGIS for production of maps, photography and graphic design for an extension manual, community outreach through the homegarden plant distribution and nursery establishment from first principles (finding sites, connecting with land owners and skills training). I have also gained a good understanding of the tropical forest register and other techniques for assessment of tropical forests.

I would like to see the award target young foresters in developing countries who would not be able to imagine funding such a venture without help. When I think of my Sri Lankan associates visiting Australia I know that the wide open spaces and freedoms that we enjoy here would make it a unique experience. As I plan to continue my association with RRI and CFA, perhaps this wish will become a reality one day. Many thanks to all who made this experience such a positive one for me.

AGM and UK Branch Tour Dates 2006

Forestry in the heart of England

This year's UK tour and AGM will take place in Shropshire, the birthplace of the industrial revolution. A range of visits has been arranged to give an insight not only into the role of wood in some of the major developments of the industrial revolution but also into current forestry initiatives in the area. Please book early by contacting us at cfa@cfa-international.org. We look forward to welcoming you to this interesting weekend!

Date	Time	Location	Subject	More information
Friday 12th May	Afternoon	Weston Park	**. Ancient trees** **. Wildlife management** **. Plantations** (14.00 - 16.00 followed by tea and biscuits)	 www.weston-park.com
	Evening	Ironbridge Gorge	**CFA AGM** (18.30) followed by **dinner** (20.00)	Meal options TBA
Saturday 13th May	Morning	Ironbridge Gorge	**Talk : *The essential role of forests and wood in the age of iron*** (9.15)	 www.ironbridge.org.uk
	Morning and afternoon	Ironbridge Gorge	**Guided tour of selected Ironbridge museums** highlighting the links between wood and the industrial revolution (10.00 - 16.00)	
	Evening	There is no formal dinner organised. We felt that you would prefer to arrange with old and new friends to have dinner together. There will be a list of pubs and restaurants available nearer the time.		
Sunday 14th May	Morning	Greenwood Centre	**Tour of activities focussing on coppicing and biofuels** (9.30 - 12.00)	 www.greenwoodcentre.org.uk

Accommodation
A comprehensive range of accommodation is available in the area ranging from Youth Hostels through B&Bs to top of range hotels. Please consult **http://www.ironbridge.org.uk/v_region.asp** for more information. We will leave it to you to make your own choice.

First international meeting of new streamlined Executive Committee

November 4th 2005 was a significant day in the history of the CFA as it witnessed the first international meeting of the new-look Executive Committee. The CFA Regional Coordinators who make up the Committee held their meeting via a telephone conference call (minutes are available on the Members Only page on the website) which linked four continents and paved the way for improved communications between Committee members in the future.

As part of the streamlining of CFA management, the Governing Council will be restructured over the coming months to better reflect the international composition of the Association. We are currently seeking new Governing Council members so if you would like to become part of our management team, or you know someone who might be, then please get in touch.

Wanted: forester for important job. Must be young!

As part of our drive to create more opportunities for young foresters to gain professional development we would like to invite applications from any of our members below 35 years of age to become our Youth Representative on the Executive Committee. The successful applicant will help oversee the management of the CFA and advise on activities which have particular relevance to young foresters around the world. Meetings are held by telephone, so the successful applicant can be located anywhere – as long as they have access to a phone. If you are interested please contact us at cfa@cfa-international.org for more details.

Letters

Trees and water

I refer to the article *Research confirms water sceptics' worst fears* in the September newsletter. Of course trees use lots of water if they can get hold of it. The experiments established already in the 1930s in the Jonkershoek valley near Stellenbosch in South Africa showed that the greater the biomass, the greater the water use. To get maximum water yield from an area, one should denude it of all vegetation, but then one also gets maximum soil erosion and maximum flooding. Not even the recent iconoclastic FAO/CIFOR report denies that obvious truth. There *are* areas where the water which falls on the land is so precious that it is worth more than the forest products which could be grown on that land, and in such areas forests should be kept away, but I am worried that the article will make people think that this is the rule and not the exception.

A tree is like a pump in that where it grows with is roots in contact with a permanent water table, e.g. alongside a stream, it will use far more water than if it did not have such contact, even though in the latter case it may grow just as fast, i.e., the tree with a plentiful supply of water becomes a water-guzzler, and an inefficient user of water in the sense that it uses far more of it per cubic metre of wood produced than the tree with a less plentiful supply. That is why in South Africa the Forestry Department already in 1932 adopted the policy of not establishing plantations within 20 m from streams. In 1972 this became the law.

If the townspeople, the farmers and the foresters had to compete on an equal basis for water, which was then sold to the highest bidder, the townspeople would normally win hands-down, so from an economic point of view I suppose it makes sense to let them have preference, but if this means that the owners of the land on which the water falls are forced to apply an economically sub-optimal land use, they should be compensated for that. In other words, an owner of a forest could say to the downstream users, be they townspeople or farmers, "Alright, I will cut down my forest to release more water to you, but then you should pay me &x per cubic metre of released water". Or a land owner who is planning to afforest his land could say, "Pay me &x and I will desist".

Agricultural subsidies in the UK were abolished in 1846 when the Corn Laws were repealed, but then they crept back in the 1930s and continued under the Common Agricultural Policy (CAP), with the result that vast areas of steep hill country in the UK which should never have been ploughed, have been ploughed, and this may well have contributed to flooding in recent years. Such land, in my opinion, should rather be under forest, which could also be open to outdoor recreation.

The South African water policy, lauded in the article, is flawed because forestry is the only rainfed land use that has to pay for the water it uses, and that skews the land use decisions (see Correspondence in CFA Newsletter of June 2000). The Department of Water Affairs in SA is undermining a century of forestry education with its indiscriminate anti-trees policy. In the dry areas of Australia they also destroyed the trees, and that raised the water table and led to today's huge salinization problem. In May 2003 the South African water expert Professor Peter Roberts, in a lecture at a symposium in the Forestry Department of Stellenbosch University, said that huge quantities water in South Africa still flow into the sea, and that the people who advocate saving water don't always know *for what*? So that it too can run out into the sea? Or so that it can be used in some highly subsidised irrigation scheme to generate votes and to generate effluents full of chemicals?

What I am trying to say is that of course trees use water, all vegetation and all agricultural crops do, but that very often the best use of water – clean and green – is for trees. And the fact that forests cannot prevent the occasional *catastrophic* flood does not mean that they do not reduce flooding. We must not throw out the baby with the bath-water.

Mikael Grut

Special Feature: India

The Forest Service in India – an overview

*By **Jagdish Kishwan** and **A K Goyal** Inspector General of Forests and Deputy Inspector General of Forests respectively, Ministry of Environment & Forests, Government of India, New Delhi.*

INTRODUCTION

The need for setting up an organization to ensure scientific management of India's forests, was first emphasized by Lord Dalhousie, the then Governor General of India in 1855. The appointment of Dr. Dietrich Brandis, a German Forester, as the first IGF of India in 1864, was the first step in this direction which laid the foundation of forest services and scientific management of forests in India. In the beginning, the forest management being oriented towards revenue generation was manned by the personnel drawn from the civil services and army. Subsequently, there was an increasing demand for the trained manpower at various levels to implement challenging programmes and policies of the government. The vision of Dr. Brandis brought into existence the full-fledged services of scientifically trained officers when his proposals for providing trained forest officers to man the forest service were accepted and first batch of five candidates was selected to undergo forestry training in France. By 1870, forest department and a regular forest service began to function in India (Malhotra 1986).

The provinces also felt the increasing demand of trained personnel which led to a proposal for creating the 'Provincial Forest Service' (PFS) in 1891. Initially, Europeans were appointed to man the PFS, and later the recruitment to the service was confined to promotion of rangers of proven merit. With the establishment of FRI, in 1906, a one-year course was started for training of Rangers for admission to the PFS and later in 1912; a separate two years' course was started to train personnel for appointment to the PFS. Due to decrease in demand, recruitment to the gazetted officers' level remained suspended from 1933 to 1938. By then, the subject 'forest' was transferred from 'Central List' to the 'control of various provinces and princely states'. The Imperial Forest Service was replaced by the Superior Forest Service of the States.

Officer Trainees participating in a panel discussion

THE PRESENT SCENARIO

The forest service in India has four hierarchical levels. The Indian Forest Service (IFS), State Forest Service (SFS), Forest Range Officers (FROs) and the subordinate forestry services comprising Deputy Range Officers (DROs), Foresters (FOs) and Forest Guards (FGs).

Indian Forest Service

To provide best available talent to the States as well as the GOI to man all posts carrying higher duties and responsibilities, and to maintain uniformly high standards in forestry administration and management, need was felt to constitute a service with common pattern of recruitment and content of training throughout the country. This led to creation of IFS as a new All India Service under the All India Services (AIS) Act, on July 1966. Recruitment to the service is done through an annual all India competitive examination open to science graduates, conducted by the Union Public Service Commission.

At present, there are 24 cadres in the IFS. Training and service conditions of the officers are governed by the rules and regulations framed under the AIS Act. The strength and composition of each cadre is reviewed regularly by the GOI in consultation with the States concerned. The number of candidates recruited varies every year. Due to fillip to social forestry programmes in the states during 1980s, there had been heavy intake in the service from 1984 to 1987 when 553 candidates were recruited in a short span of 4-5 years. The strength of the service increased over the years from 57 in 1869, 163 in 1885, and 537 in 1947 to 2738 in 1997 (Goyal 1997). The present cadre strength is 2 763.

State Forest Service

SFS is one of the premier civil services of the States/Union Territories (UTs). Recruitment is made through the State Public Service Commission (PSC), under the Recruitment Rules of the States. Of late, recruitment to the service has become irregular. Some of the States have discontinued direct recruitment, and instead fill up the vacancies through promotion from the FRO level. One-third of the posts in the IFS cadre in any State/UT cadre is filled up by promotion from the SFS.

Forest Range Officers

The cadre management of FROs is the responsibility of the respective States/UTs. Recruitment is made through the PSCs. A few States have temporarily discontinued direct recruitment to this cadre, and consequently the vacancies are filled from the level of DROs/foresters.

Subordinate Forestry Services

The management of the subordinate forestry services is the responsibility of the States/UTs.

Deputy Range Officers

Recruitment to this level wherever, it exists, is made through promotion from the level of forester. In some States, the DROs are given special assignments in the offices of FROs/Divisional Forest Officers (DFOs) before they are promoted as FROs.

Foresters

Recruitment to this level is done through two sources, i.e., directly through a competitive examination by the State Forest Department (SFD), and through promotion from the level of FGs.

Forest Guards

FGs are the frontline functionaries in the forest management and the posts are filled up by direct recruitment except for a small percentage of posts wherein opportunity is given to forest watchers, peons and even ministerial staff for entry to this level. The recruitment at this level is quite irregular.

ORGANIZATIONAL SET-UP

The ownership and management of forest and wildlife resources is the responsibility of the States. The organization at the State level is headed by a Principal Chief Conservator of Forests (PCCF) assisted by Addl. PCCFs and CCFs in-charge of different wings like territorial, planning, development, wildlife, and establishment. At field level, the forests are managed through forest circles held by CFs, divisions by DFOs, ranges by FROs, sections and beats by foresters and FGs, respectively. The organizational structure is suitably modified for territorial and functional activities. The basic structure of the SFDs in the States is almost the same. However, some local and management specific variations do exist.

The subject of 'forests and wildlife', being on the 'Concurrent

List' of the Constitution of India, the major policy formulation and related enactments are made by the GOI in consultation with the States. At the Government of India (GOI) level in the Ministry of Environment and Forests (MoEF), the forestry set-up is headed by the Director General of Forests and Special Secretary. He is assisted by Addl. DGFs, IGFs, DIGFs and AIGFs for discharging various specialised functions in the GOI including policy and institutional matters, administration of subordinate offices, forestry organizations and implementation of forestry and wildlife schemes for providing assistance to the states.

NEED FOR PROPER CADRE MANAGEMENT

The foresters, especially at the subordinate levels in the field, have to work in remote areas, and many a time under inhospitable conditions with almost negligible civic facilities and inadequate infrastructural support. It is imperative that the management of all the forestry services is done in a comprehensive manner through long term prospective planning with focus on reforms in recruitment strategy, career advancement, placement policy and access to appropriate facilities for their families (NFC 2005) so that they remain a dedicated and motivated group concentrating on the conservation of forests and development of local communities with whom they are required to interact closely.

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Forest management in India: problems and practices

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Forest resources

Forests in India cover 77.47 M ha., or more than 23% of the geographical area in the country. H.G. Champion and S.K. Seth classified forest types of India into 16 major groups on the basis of temperature and moisture regimes. The forest types range from Wet Tropical Evergreen to Alpine Scrubs and from Littoral Swamps to Desert Scrubs, based on floral diversity, crop composition and ecological status.

Dialogue with stakeholders is an example of a more enlightened approach to forest management

The forest policies in India envisaged about 33% of geographical land to be under forest. There are 35 administrative units working independently to achieve the policy objectives. There are 593 district units under the administrative control of these 35 units and 187 districts are classified as tribal districts, which are less developed in terms of infrastructure facilities.

Forests play a major role in the lives of the rural population who use them for grazing, collection of non-wood forest produce and fuel wood for livelihood needs. The annual forestry operations offer employment opportunity to the communities living in and around forests. The moist and dry deciduous forests in India comprise about 70% of total forest area.

Forest resources are limited due to poverty and population. The average annual fuel wood consumption is 0.5 tons per capita for 45% of India's population. The estimated requirement for 400 M people using it as major household fuel is 200 M tons while availability from forests is only 17 M tons. People living in and around forests withdraw an unaccounted 100 M tons of fuel wood from forest annually. The total demand of timber for housing and industrial consumption in 2001 was 73 M cmt against production of 26 M cmt from the forests and the rest is met from plantations and non-forest areas. The magnitude of demand is outstripping the modesty of silvicultural approaches to sustainable management.

Forest policy

The forest policy in India has been developed on the basis of immediate needs, intermediate priorities and long-term envisioning of resource uses for intangible goods and services. It has addressed the needs of the hour and presently is in consonance with the global strategies and international forestry dialogue. The participation of local communities in management of forest resources is evolving through a policy of care and share. The balance of natural resources is critical as the country is managing one-sixth of the world's human population and one-fifth cattle population. Classified as one of the 12-mega diversity countries, India has emerged tremendously strong to endure and sustain the enormous grazing pressure and extraction of forest produce for livelihood needs. Its stand to develop non-legally binding instruments to ensure sustainable forest management in the International Arrangement on Forests that won appreciation during UNFF 5.

The States have produced their own forest policies, which are within the framework of the national policy. The production of biomass and its harvesting are regulated by scientific principles and both the legislature and judiciary monitor activities in the sector closely.

Management practices

The five management priorities outlined in the National Forestry Action Plan 1999 are to protect existing resources, improve forest productivity, reduce total demand, strengthen policy and institutional framework and expand forest area. Strategies developed to achieve the goals within the National

Afforestation Program incorporate all five components. The forestry projects are designed to incorporate the linkages with humans as an inseparable component of the ecosystem. As such, man becomes the central theme in forest management.

Forest management plans are formulated on the framework of a common national code for both managed forests and protected areas. The managed forest prescriptions include thinning, planting, soil moisture conservation interventions, protecting the fragile forests, rehabilitating the degraded forests, assisting natural regeneration, biodiversity conservation, wildlife habitat management, and social obligations of the communities living in and around forest areas. It presents an integrated development of forest ecosystem managed for sustainability since 1875. The theories of silviculture are applied in prescribing the treatment of particular areas.

There are 15,000 local institutions constituted to jointly manage forests spread over 15 M ha forest area. The institutions are recognized bodies with gender balance and exercise their stakes under the care and share policy.

Forest diversity provides a range of goods and services

The way forward

Current funding of the forestry sector is drawn on the basis of tangible goods and services provided by the sector. Less than one percent of the total Plan outlay is invested in 23% of the country's geographical area. The demand for livelihood options from forests is paramount and immediate remedies to address abject poverty are required to sustain forest resources. The protected area network attracts special attention from the international community and civil society to discourage use of animal parts and trophies in the market. The present Tiger threat unearthed startling facts about its trade in international markets.

Forestry education and training in India

*By **A K Goyal** Deputy Inspector General of Forests, Ministry of Environment & Forests, Government of India, New Delhi, India.*

2003 course meeting with the Prime Minister

HISTORICAL PERSPECTIVE

The systematic development of forestry education and training in India is, perhaps, one of the oldest in the world. With the appointment of Dr. Dietrich Brandis, as the first Inspector General of India, it made a steady progress towards scientific management of forests (Malhotra, 1986). Dr. Brandis recognised the need for qualified and well trained personnel for forestry management and administration in the country. Initially from 1867 till 1926, the officers of Imperial Forest Service were trained in France, Germany and United Kingdom. By 1870, a regular forest service and the forest department came into existence (Srivastava 1986). In India, training of forest officers began with the establishment of a small Central Forest School at Dehradun in 1878 for training of Forest Range Officers (FROs). Soon, need was felt to start the Provincial Forest Service (PFS). In 1906, a one-year course was started for the training of FROs for recruitment to the PFS in the Forest Research Institute (FRI), Dehradun. Later in 1912, a separate two-year course began for direct appointment to the PFS. When the Imperial Forest Service course was introduced in 1926 at the Indian Forest College (IFC), Dehradun, the PFS course was abolished. Training of gazetted forest officers remained suspended from 1933 to 1938 due to decreased demand. In the meantime, training in the subject of 'forests' was transferred to the provinces and princely states, and the Imperial Forest Service was replaced by the Superior Forest Service. Courses for training these officers began in 1938 at IFC and continued until 1975. The Indian Forest Service (IFS) was created on July 1, 1966. The courses for SFS and IFS officers were separated during 1976. Pursuant to increasing demand for SFS officers, three SFS Colleges were opened. Similarly, to meet the high demand for rangers, nine Forest Rangers Colleges (FRCs) were established between 1912 to 1982.

Re-organization of forestry research, education and training

Keeping in view the emerging trends in forestry management, a need was felt to reorganise forestry research, education and training in the country. During 1987, forestry research and education were reorganised into the Indian Council of Forestry Research and Education (ICFRE), with research institutions and advanced research centres under its umbrella. The objective of education was expanded beyond in-service training to cover all persons who wanted to pursue studies in forestry. In-service training institutions underwent reorganisation in the process. The IFC, later named as the Indira Gandhi National Forest Academy (IGNFA) conducts courses for IFS officers. The mandate of SFS training was given to the Directorate of Forest Education (DFE), Dehradun, under direct control of the MoEF. With one exception, all the FRCs were handed over to the concerned states. The technical control on recruitment and training of FROs remained with the DFE.

PRESENT SCENARIO

Forestry Education

Based on the recommendations of the National Commission on Agriculture in 1976, for enlarging the scope of forestry education,

the agricultural universities started graduate and postgraduate forestry courses. ICFRE besides providing financial support since 1990-91, has also developed university and school level curricula for forestry education. The FRI Deemed University established in 1991 also runs many courses.

FORESTRY TRAINING

Indian Forest Service

Course contents and pattern for induction training for IFS probationers are revised periodically as per requirements of the sector. The present syllabus introduced in 1994 on a 'sandwich pattern' consists of five phases during a three-year probation. The syllabus has recently been revised to provide adequate inputs on environmental and social development issues, and use of modern training methodologies and tools. For the promoted IFS officers, ten-week skills upgradation courses have also been conducted at IGNFA since 1995.

State Forest Service

For the SFS, training is organised in SFS Colleges. Over the years, recruitment to SFS has been reduced by the States and posts are being filled through promotion from the level of FRO. From 1983 to 2005, only 29.3% of capacity of these colleges could be utilised (utilization was 61% until 1990-92 and 11% between 1991 and 2005) (DFE, MoEF). The "Entrance and Training Rules and Syllabus" for induction courses were revised by the MoEF in consultation with the States/UTs in July 2004.

Forest Range Officers

The induction training for FROs is being organised under the technical control of the DFE. The MoEF has revised the 'Entrance and Training Rules and Syllabus' in July 2004. The direct recruitment to this level also has been drastically reduced by the States. Presently, there are five FRCs, one with the MoEF and others with the States. From 1974 until 2005, 4336 FROs have undergone induction training.

Subordinate Services

The induction as well as in-service training of subordinate staff is the responsibility of the States/UTs. There are 62 training schools in the States for imparting training to these levels. To bring uniformity in the training pattern as well as course contents, the MoEF issued guidelines to States for training of foresters and forest guards during July 2004. In a few states under externally aided projects, the personnel at these levels also have been exposed to new concepts in forest management. The MoEF reviewed the position and decided to organise courses for these levels also in the state training schools from 2003-04 onwards.

Training and Education Needs Analysis

For continuous upgradation of skills and knowledge for keeping abreast with latest developments in the sector, the MoEF has been encouraging the States for capacity building of the personnel at all levels by sponsoring short-term refresher courses in training institutions. Need is felt to increase the number of such courses and improve participation by the personnel. During the last four decades, there has been paradigm shift in forest management in the country. Until the 1970s, forests were being managed in traditional way mainly for revenue considerations. During the 1970s, a lot of awareness was created about conservation of wildlife which led to enactment of Wildlife (Protection) Act and launching of the 'Project Tiger', the largest conservation programme in the country. During the 1980s, the emphasis shifted on large-scale social forestry and afforestation programmes. In 1990s, the new National Forest Policy laid emphasis on the involvement of people in forest management which became the central theme of all forestry schemes, programmes and activities. From late 1990s onwards, the environmental concerns and socio-economic development of the stakeholder communities have come to the forefront. Accordingly, the role of foresters has also changed to that of conservationists, sociologists and environmentalists who have to take care of livelihood needs of the forest dependent communities and conserve the forests for ecological security of the country and also play an important role in furthering the nation's interests at the global level.

Although the syllabus for induction courses for all levels is being revised periodically keeping in view the changing demands of the sector, the importance of management development programmes (MDPs) cannot be undermined. The fundamental principle of MDP is to determine one's own needs and to seek the most appropriate ways to meet them through identifying clear job roles, objectives and identifying learning needs, individual development plan and continuous development, evaluation and feedback (Goyal 1997). Similarly, there is need to periodically modify the syllabus for forestry courses in the universities and schools. The MoEF has recently initiated a process of 'Professionalizing the Forest Service' aimed at continuous upgrading of skills and knowledge and encouraging the foresters to develop expertise in field(s) of their interest.

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Participatory Forest Management in India: sharing governance with the people

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Introduction

Forests have been the source of Indian civilization and culture. Once a golden bird in the eyes of foreigners the country suffered subjugation for many centuries. Notwithstanding these trials and tribulations the people kept intact the core values of their civilization and culture and ultimately emerged out of the quagmire. The closeness to nature kept the people vibrant and contented despite underdevelopment. The veneration for the trees, forests and wild life among the people resulted in drawing physical and mental sustenance and contentment. No wonder when the modern forest managers in India several decades after the independence felt the heat of managerial failure on account of deforestation and resultant conflicts with the forest dependent people a new paradigm emerged in which the examples of community protection and management of forests were institutionalized.

National forest policy of 1988 and a felt need for the participatory forestry

The country's constitution after the 42nd amendment imposes fundamental duties on its citizen to protect the environment, forests and its wild life. The National Forest Policy of 1988 gave direction to the Governments to enact policies and programmes to involve the local communities living on the fringes of forests in the forest management processes. The primacy of conservation for protection of environment and safeguarding the interests of forest dependent communities in the country's forest policy heralded the beginning of a new era in the forest management in the country. This author has the privilege of being associated from the very beginning with this process as a field forester, researcher, academics and finally as policy formulator at the highest level in the Government of India until 2004 June.

JFM Circular of June 1990 and thereafter

As is well known more than 90% of the forests in India are owned by the Government and administered by a professional service trained in its own ethos and standards, which are some times more akin to realizing narrow professional objectives than to the requirements of the time. It is difficult to introduce swift changes in such a milieu. But the change has to occur as it is the inevitable law of nature and forest management witnessed such a change. The leadership came from the foresters and people themselves. The process began with the Government of India's circular of 1990 on the Joint Forest Management (JFM) to involve the villagers in the rehabilitation of degraded forests and, ever since the history of India's forest management is being rewritten.

A few foresters took their cue from the Sukhomajri and Arabari experiments of seventies and early eighties. People took aspiration from the similar experiments in Orissa, and the Chipko movement of Himalayas among others. The programme picked up in several parts of the country especially in the Central, Eastern and Southern parts. The programme is based on 'care and share philosophy'. Most of the Non Timber Forest Products are given free of cost to the people. The share in major crop after final harvesting is from 100 % in some States to 25% in others. Most of the States give around 50% of the share to the JFM Committees. The early reports on 'Jhabua and Harda' by the author had a major impact on the psyche of the foresters as most of them especially the young officers started experimenting with the willing public and stories of success after success started flowing. The JFM Committees are reflection of harnessing the democratic powers of people for conservation and creation of wealth from natural resources. But there was lack of a forum at the national level to articulate the conflicting feedbacks into a policy making instrument and monitoring mechanism.

Establishment of JFM Cell in the Ministry of Environment and Forests and Policy Framework

Around 4 million hectare of forestlands were under JFM programme until June 1998 and it covered 17 States. The programme received a major boost in August 1998 when a JFM Cell was created in the Ministry of Environment and Forests. The Ministry after wide ranging discussions among all the stakeholders issued the major policy guidelines in February 2000 and again in December 2002. The key reforms were in the field of legal recognition to JFM Committees, extension of JFM on good forests (crown density above 40%), increased participation of women, relationship with elected Panchayat bodies, micro-plan implementation etc. The other major initiative taken was creation of a permanent JFM net work and Stakeholders forum to obtain feed back for policy formulation. The programme as a result of these policy reforms picked up very well as on September 2003, 17.33 million ha of forest land was being managed through 84,632 JFM Committees in 27 States.

Taking into consideration the success of JFM Committees in the field of forest conservation and their success as self help groups for livelihood generation the Ministry of Environment and Forest also set up Forest Development Agencies (FDAs) as federation of village level JFM Committees in the last two years of Ninth Plan in the year 2000 to implement the forestry activities in a decentralized manner in which the people not only take decisions with regards to the species to be planted but get the funds and actually implement and execute the work. Beside this, they also get additional 30 % of the fund for carrying out entry point activities for the welfare of their village. The programme of FDA has been a great success and the National Afforestation Programme is being 100% implemented during the X plan period through the FDAs. FDAs are constituted in over 500 divisions in the country. Tripura a small State bordering Bangladesh in the North-Eastern region of the country and prone to tribal insurgency had done exceptionally well in the country on JFM. Out of the four outstanding FDAs in the country ranked by independent evaluators one is from Tripura. The State has noticed rapid improvement in its forest cover during the last decade due to JFM as per the 2001 and 2003 assessment of Forest Survey of India. The forest and tree cover increased by 10% of the geographic area (1028 sq.km)

between 2001 and 2003 assessments. The State is third in terms of total accretion and first in terms of percentage increase in forest cover in the country considering the changes noticed between the two assessments. The sound forest management and creation of livelihood opportunities for the tribals through JFM mechanism together with other measures taken by the State Government is now proving as a potent counter to tribal insurgency. The tribal youth is now engaged gainfully and is not easily drawn to terrorism. Around 20,000 tribal families are getting sustenance under JFM/ FDA programme

Expansion of JFM as on July 2005

The programme is steadily progressing and posing next generation questions to be solved. As per the latest monitoring done by the Government of India in July 2005 the JFM process covers 20.5 million hectares of the forest as shown in the table given below:

State	**Area under JFM (ha.)**
AP	2 289 000
Arunachal Pradesh	90 800
Assam	79 251
Bihar	371 880
Chattisgarh	283 2415
Goa	0
Gujarat	238 242
HP	424 649
Haryana	58 225
J & K	43 026
Jharkhand	2 186 066
Karnataka	323 989
Kerala	166 108
Maharashtra	2 512 000
Manipur	93 941
Meghalaya	3 970
Mizoram	17 660
MP	5 946 800
Nagaland	21 078
Orissa	817 788
Punjab	178 333
Rajasthan	575 181
Sikkim	5 948
TN	478 949
Tripura	104 152
Uttar Pradesh	78 526
Uttaranchal	0
West Bengal	628 879
Total	**20 566 856**

The programme has been qualitatively doing very well in Tamil Nadu, Tripura, Chattisgarh, Andhra Pradesh and Madhya Pradesh. The target is now to universalize the JFM approach in forest management and to cover all the 32 million ha of forests situated in and around 170,000 villages of the country. This author firmly believes that the JFM approach should be extended to protected areas but in a modified manner. This will be the only way to secure the future of tigers and other Wildlife in India. A paradigm shift in the Wildlife management strategies is sorely needed.

The Role of NGOs

The programme was ably supported by the local NGOs and international NGOs such as the Commonwealth Forestry Association (CFA). CFA published a book in the year 2004 entitled ***Root to Canopy*** which is the only comprehensive reference book on JFM today available in India. CFA also played a key role in providing policy back up by organizing an international seminar on ***India's Forest beyond 2000*** in the year 2000 in Delhi and also started ***Brandis and Chaturvedi memorial lecture*** to stir the intellectual discussions.

The Future steps

Notwithstanding many pitfalls, the JFM programme in India has made great strides in involving people in the governance of forest to enhance their livelihood. The ultimate gain of JFM in the country, however, has been in making people aware about their rights to participate in the governance of natural resources. For further consolidation and empowerment we need to tackle the issues on equity, sharing mechanism and decentralization and the relationship with political set up especially with Panchayat bodies. The independent identity of JFM people is an eye sore to many and it need to be retained and sustained at all costs to ensure that the success achieved is not lost. A political consensus therefore, is required to be built up. The programme should be backed up with adequate focus on developmental activities so that the dependence of people on forests is gradually eliminated. Forests in the end should be managed to get clean water and air, and income from forests should be a bonus.

Wildlife Conservation in India

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India is rich in floral and faunal diversity. Though it occupies 2.4% of the geographical area of the world, it harbours 8% of the worlds' biodiversity. This richness of biodiversity is due to its location at the junction of the Afrotropical, Plaeartic and Indo Malayan realms which has endowed it with all possible types of ecosystems viz mountains, valleys, flat lands, arid and semiarid zones, freshwater rivers and lakes, estuaries, coasts and Islands. The climate ranges from arctic in the Himalayan mountain ranges to tropical and sub tropical in alluvial plains and the peninsular region. The annual rainfall varies from a low of 100 mm in the deserts to as high as 5000 mm in the eastern hilly region of the country. The geological changes in the past

King of the forest, but for how much longer?

coupled with its location and the resultant varied ecosystems makes it one of the twelve mega diversity centres of the world. The Western Ghats and the Eastern Himalayas are among the 25 biodiversity hotspots of the World.

India is home to 15,000 species of flowering plants, 2,500 fishes, 215 amphibian, 480 reptiles, 1,200 birds and 425 mammalian species. It holds 65% of the world's tiger and elephant (Asiatic) and 85% of Indian one horned Rhinoceros population. In addition, it posses the only population of the Asiatic Lions, and the Brow-antlered Deer (*Cervus eldi eldi* – a sub species of Thamin deer). Large number of species are endemic to India including 82 species of amphibians, 42 species of birds and 10 genera of mammals. The list will grow further (particularly among lower animals) as forests in Western Ghats and Eastern India, coastal and marine zones are further explored.

Though total forest cover in the country is estimated to be 20.64% of its geographical area, only 1.5% of this cover is classified as dense, the rest having moderate cover to open. Ministry of Environment & Forests, govt. of India, 2005. This forested landscape is also highly fragmented, thereby disrupting gene flow across ecosystems and landscapes. The pressure on the existing forests is further accentuated by 90 million cattle grazing there. The unrelenting biotic pressure has pushed many species the brink -18 are critically endangered, 54 endangered, and 154 vulnerable (IUCN Red Data List 2000). We already have lost at least two species of birds viz. Pink headed duck (*Rhodonessa caryophyllacea*) and Mountain quail (*Oprysias uperciliosa*) and two species of mammals viz. Hunting Leopard (*Acinonyx jubatus*) and Lesser One-horned rhinocerous (*Rhinocerous Sondaicus*).

Viewed in this perspective, and the fact that the human population growth in India is unabated and engines of infrastructural development and mining are threatening to eat into the already fragmented habitats of wildlife across the country, lets us appraise the wildlife conservation strategy the country is pursuing. Based on major species associations, geographic landscapes and ecosystems, the Wildlife Institute of India has divided the country into 10 biogeographic zones. Each of these biogeographic zones has been further subdivided into 26 provinces. The unique floral and faunal diversity contained in zones and provinces need to be conserved over sufficiently large areas to ensure the gene flow among populations to maintain their genetic diversity. Keeping this in view, a network of protected areas across the country has been established.

Presently 4.73% of India's geographical area spread over its 10 bio- geographic zones, have been designated as protected areas.[3] It covers 15.67 million ha of forested tract of the country. Out of these protected areas, 94 are categorized as National Parks and 501 as Wildlife Sanctuaries which correspond to category II and IV of IUCN category of protected area. These protected areas are under the direct control of the government and are run by professionally trained managers. The funds are provided both by the Central (federal) as well as the State (provincial) governments for its protection and development. The principle of management is based on 'Ecosystems Approach' i.e. the area has to be managed with least management interference with a view to allow the biotope to recover and take care of itself. No exploration is allowed in National Parks whereas local people may be allowed to take forest produce for their bonafide personal use from wildlife sanctuaries. Hunting is banned all over the country. The infringement of the Wildlife Protection Act is punishable with imprisonment which may go up seven years and fine which goes up to the equivalent of US $500. Also, the constitution of the country lays down responsibility of the state and the citizen towards wildlife. Article 48 of the constitution says, 'The state shall endeavour to protect and improve the environment and safeguard the forests and wildlife of the country'. Art. 51-A (g) of the Indian Constitution enjoins, 'It shall be the duty of every citizen of India to protect and improve the natural environment including forests, lakes, river and wildlife and to have compassion for living creatures.'

The policy framework for wildlife conservation is provided by a National Board for Wildlife at Centre which is headed by the Prime Minister, the highest political functionary of the country. Similarly in the states, State Board for Wildlife are in place under the Chief Ministers of the states. The legal framework is comparable to the most stringent framework in the world. The administrative machinery is manned by forest officials trained in forestry and wildlife. A National Wildlife Action Plan (2002-2016) has been adopted which lays down detailed policy frame work for action.

The constitutional guarantee, the legal framework, the religious beliefs and the cultural ethos, have contributed to the survival of wildlife in India in spite of unrelenting human and cattle pressure. This is particularly relevant in case of the magnificent tiger which is under severe threat of extinction. The disappearance of tigers from its western-most distribution in the state of Rajasthan has raised worldwide concern. Three of the world's eight subspecies of tiger, the Balinese, Caspian and Javan Tigers have already become extinct and the Siberian Tiger population is only 200-300. The Indochinese tiger also has only a small population. Only Indian Tigers are now in viable numbers across 28 Tiger reserves and outside these reserves in the country. The recent episode of local extinction of tiger at Sariska is a cause of grave concern for all of us. However, the redeeming aspect of this unfortunate episode is that response of Government of India has been timely. It set up a Tiger Task Force to look into the problem. The report of the Task Force, which advocates a paradigm shift in the approach to conservation, has been accepted by the Government. It advocates a twin strategy of leaving some areas (natal areas) as inviolate and managing the rest of wilderness by integrating livelihood issues of the people. The implementation of this report is being monitored closely by the Prime Minister Office and therefore, there is hope that the tiger along with the diverse ecosystem across the country in which it survives, will continue to live in future.

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Forest scenes

Forests and forestry in Hungary

By ***F. Lakatos*** *University of West-Hungary, Institute of Forest and Wood Protection*

Hungary is a small Central-European country of 93,000km^2 located in the middle of the Carpathian-basin. The evolution of its natural vegetation has influenced by the ice ages and geological characteristics of the region but it was finalized by human activities in the last few centuries. At present with about one-fifth forest cover, Hungary belongs to the less forested countries in Europe. Nearly 20% of the country is covered by different tree species, which equates to 1,836,429ha of forested land.

When Hungarians first inhabited the Carpathian-basin about 1000 years ago, the forest cover was around 70%. This percentage decreased during the centuries and fell to a low of 11.8% in 1930. The present forest cover (19.7%) is the result of extensive afforestation activities up to this day with the vast majority of new forests having been established on agricultural land of low productivity. The National Forest Plantation Program was launched in 1997 and it is still progressing with about 12,000ha of new forest being planted each year.

More, than half of the forests are considered natural, or semi natural forest, even if because of the long history of human activities no virgin forest can be found in Hungary. About 20% are covered by plantations (mainly fast growing species, e.g. Poplars) and the remaining 27% consist of introduced species (e.g. *Robinia pseudoacacia*).

Broad-leaved species dominate Hungarian forests with the most common being different oak species (*Quercus* spp., 31.9%), followed by an introduced species (*Robinia pseudoacacia*, 22.6%), poplars (*Populus* spp., 10.3%) and beech (*Fagus sylvatica*, 6.0%). Conifers are considered as introduced species, covering about 13.3% of the forested land (Fig. 1.).

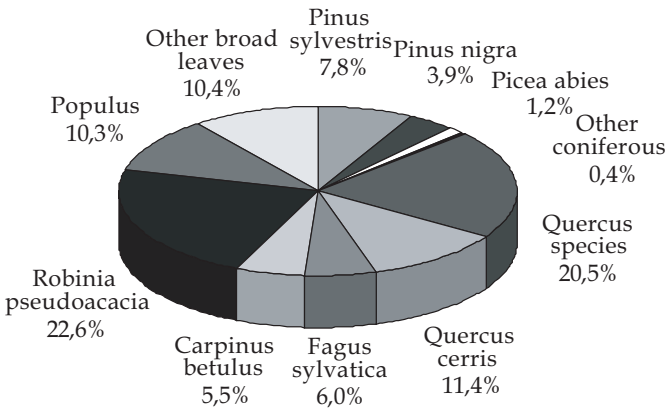

FIGURE 1 *Tree species composition of Hungary*

Fig 2 *Upland beech forest in winter*

The most characteristic feature of the Hungarian forests is the wide variety broad-leaved tree species forming a mixed, usually multistory stand.

Fig 3 *Mixed forest*

Hungarian forests have multipurpose functions and although the main function is wood production (64.2%), the importance of other benefits such as recreation and conservation is increasing. There is also a large amount of protection forest (34.4%). The remaining 1.4% has other functions such as education, research or even health protection. The function of the forest is related in part to its conservation status. About 7% of the total area of the country is under protection (using four categories: national parks, landscape protection areas, nature protection areas and locally protected areas). Half of those are on forested land. This means, that 20% of the forested land (387,000ha) is protected at different protection stages (e.g. management restrictions, protected, strictly protected areas).

Ten National Parks and 71 Forest Reserves are the main tools for nature conservation in forested areas. Among valuable, and

of course sometime endangered, forest ecosystems are marsh and floodplain forests, some types of mixed oak stands and the mountain beech forests. In the core zone of the forest reserves (est. 1993), all kind of management activities are prohibited, while in the buffer zone usually strict restrictions are in effect to keep the continuous forest cover.

Forest health is one of the major concerns of forestry professionals in Hungary and there are several monitoring systems running to evaluate the health conditions of the entire forested land. One of the main activities Hungary has been actively participated in is the ICP Forestry (International Cooperative Program on the Assessment and Monitoring of Air Pollution Effects on Forests). Results indicate that air pollution is not the main reason for tree dieback over the last 20 years. Climatic factors, like dry and hot summers contributes significantly to the reduction of the tree's fitness and therefore to the appearance of secondary damages. Different biotic agents like insects (e.g. gypsy moth (*Lymantria dispar*), bark beetles and other insect outbreaks) or pathogens (e.g. *Shaeropsis sapinea*, *Phytophthora* spp. or *Cryphonectria parasitica*) are more commonly the cause of tree mortality.

Fig 4 *Lowland beech forest in spring*

The Hungarian forest was the subject of privatization in the early 90's with the aim of eliminating, or at least reducing, the drawbacks of collectivization suffered in the 1950's. The ownership of the forested land is at present 57.0% owned by the state, 36.8% is private property, 0.8% is in corporate ownership and the ownership of the remaining 5.4% is not clear as sometimes it is hard to find out to whom the property is belonging after the radical changes in land ownership seen in the country. One of the main challenges for the present government is to put all unite these freeholders under a joint venture for the forest management. The recent estimates put the total number of new forest owners as high as 250,000, while the area of the forests in private ownership is estimated to 700,000ha (the average property size is less than 3ha).

In order to maintain state-owned forests, the state forest companies were put under the sphere of management of the State Assets Handling Joint-Stock Company (est. 1992), which is responsible for the enterprises that should be kept either in state ownership or with majority state holding (e.g. forest companies). The companies themselves were also transformed into joint-stock companies with majority state shares. The privatization has affected not only the forestry, but also different forest industries. Most of the timber harvesting is now carried out by entrepreneurs, former employees of the state forest companies. Usually the companies have even sold their equipments (used for felling, logging and transporting) to these people.

Are Hungarian forest sustainable managed? One would have to say yes, because both the total growing stock (2004: 334.3 million m^3) and the annual increment (2004: 12.5 million m^3) of the country's forests has been increased over the last decades. All forest owners (even the state owned joint-stock companies) have to manage their properties following the regulations of the forestry management plans, which are compiled by the state-authorized personals of the Hungarian State Forest Service.

The allowable annual cut prescribed by the management plan is 7.3 million m^3 (2003). Usually the actual cut is less than the prescribed one; it was 7.086 million m^3 standing (5.784 million harvested m^3) in the year 2003. 52% of this volume is used by the wood industry producing furniture, building materials, pulp and paper. The remaining 48% is used as firewood.

Hungary exports mainly processed wood products and firewood (annual income approx. €1,000 million 2003) but also needs to import timber for the building industry at an annual costs of approx. €1,500 million (2003) but Hungary consumes much less timber per capita (0.157 m^3), than the European average (0.330 m^3).

In addition to the wood industry, one of the main beneficiaries of the diverse forests are the hunters. Hungary is famous for its game animals, like deer (*Cervus elaphus*), roe deer (*Capreolus capreolus*) or wild pig (*Sus scrofa*) but there are some introduced species too (e.g. argali *Ovis ammon*, and fallow deer *Dama dama*), which occur usually in higher number than native game animals leading to conflicts between hunters, forest managers and nature conservationists.

Ensis: an arranged marriage or a tale of trans Tasman love?

*By **Glen Kile**, Executive Director, Forest and Wood Products Research and Development Corporation, Melbourne (and a former Chief of CSIRO FFP), Australia*

At the IUFRO World Congress in Brisbane in August 2005 the Presidents Discussion and the Directors Forum both focused on changes in research organizations and the ongoing competition for resources to support forest and forest industries research. One organizational change that attracted more attention than most was the formation of *ensis* a trans Tasman unincorporated joint venture between the Australian CSIRO (formerly CSIRO Forestry and Forest Products (FFP)) and the New Zealand Crown Research Institute, Forest Research. The latter has contributed part of its resources to the joint venture and rebranded the balance as Scion. Whilst the joint venture commenced 1 July 2004 it was expanded from 1 July 2005 to incorporate all of resources of CSIRO FFP.

Ensis presently has a staff of approximately 400 full time equivalents (325 categorized as science delivery and 75 science support) and focuses on what might be considered traditional forest industries research from seed to product. It is organized into seven business units with all business units having staff in

Australia and New Zealand. Staff are located across eight sites in the two countries although the major concentrations are in Canberra, Melbourne and Rotorua. *Ensis* is more than four times larger in staff and budget terms than any other forest industries R and D provider in Australia or New Zealand.

The rationale for the joint venture is given as building critical mass, reducing duplication (and competition), improving skill sets and reducing transaction costs for R and D funders. There are merits to these arguments given the common interest between the two countries in exotic softwood forestry and associated common interests in such areas as forest health and biosecurity, wood property improvement and products produced from the resource including solid timber, engineered wood products and paper products. There is perhaps less commonality of interest in areas such as native and plantation hardwoods, commercial environmental forestry, bushfire research and the valuable work CSIRO has been doing for international development in the Asia- Pacific region over many years. It is critical that the capacity to respond appropriately to national priorities and national obligations is not lost under the new arrangements. Economically Australia and New Zealand are increasingly seen as one market and the emergence of companies with trans Tasman operations such as Carter Holt Harvey, Weyerhaeuser, Norske Skog provides a further basis for research provider rationalization.

The real challenge is perhaps not in forming the joint venture but how and what it will achieve over and above that which would have been accomplished by the parent organizations. Challenges would appear to be the commonality of or divergence of national interest already referred to and how that translates into science planning and effort, the operational issues of working across a west to east 5000km plus geographical spread and four hour time zone difference, marrying different cultures and staff on different terms and conditions and reward systems, and high and perhaps in some areas unrealistic external earnings targets. Certainly ensis appears to have a very strong commercial focus and how public and private good will be balanced is unclear. The emphasis on profit, albeit for reinvestment, could become an impediment to science development unless specifically managed. In addition there is the no small matter of maintaining the financial support of the parent organizations. The big challenge for research units in CSIRO is maintaining support from the CSIRO global budget in the face of many competing interests shifting priorities and changing arrangements across that large and diverse organization.

The inevitable marketing spin around joint forces, creating critical mass and a large research entity hides an ongoing decline in the resources devoted to forest industries research in Australia and New Zealand over the last decade under our market driven, user pays and contestable funding regimes. This has occurred in both parent organizations but has been particularly severe in the former CSIRO FFP. Over the last three years FFP has lost about 25% of its staff, eroding significant science capability. New partnerships such as *ensis* don't compensate for some of the losses that have occurred.

The seeds of almost all the major innovations delivered by both CSIRO and Forest Research that have helped the industry were sown more than a decade ago, some more than two decades ago and patiently nurtured by the management of the respective organizations. Some stakeholders of forestry and forest products R&D might well ask, will the joint venture have the real long-term perspectives and commitments in forest science to continue that tradition or will it be simply run with an eye on today's financial performance.

Whilst those in ensis are enthusiastic to make this joint venture work the jury will be out for several years on whether it can deliver benefits beyond those of the capacity of individual partners or could have been delivered through other strategic or selective partnership arrangements. The success of the joint venture seems particularly critical for Australia as failure could lead to the fragmentation and further dissipation of our national forest industries research capacity.

Success will require goodwill, creative and nurturing management and leadership at all levels over the next few years. However, the joint venture agreement has now less than two years to run in its current form and already Dr Geoff Garrett, Chief Executive of CSIRO has publicly stated in an interview the possible review and restructure of the agreement with the formation of an incorporated company one future option*. For the Australasian forest industries, consolidation and research delivery seem far more desirable than more reorganization with its attendant uncertainties.

* Australasian Science, September 2005 page13

The bumpy road to clean, green fuel

Osman Ibrahim is encouraging farmers in Malawi to abandon their traditional tobacco crops and enter the energy sector — by planting a tree called jatropha (*Jatropha curcas*). Its seeds contain an oil that can be blended with conventional gasoline or diesel to make ‚biodiesel', an eco-friendly alternative to fossil fuels. Pure, the oil can be used for cooking, lighting or generating electricity. And the range of by-products includes glycerin — used in cosmetics — and ‚seed cake', which is re-processed and used as an organic fertiliser.

Ibrahim, who heads an organisation called the Biodiesel Agricultural Association, considers the tree to be a kind of ‚green gold', a cash crop that can boost rural incomes in poor countries while helping address issues ranging from climate change to soil erosion. Ibrahim is not alone, nor is Malawi unique. Elsewhere in Africa, and in parts of Asia and Latin America, plantations of jatropha are appearing.

Clean development

In Indonesia recently, the heads of six major energy companies gathered with the governor of the central bank, a dozen cabinet ministers and representatives of universities and local development organisations to sign a declaration supporting government plans to produce jatropha oil on a large scale. According to the plan, by 2009 Indonesia will have ten million hectares of jatropha plantations, each hectare yielding enough oil to produce 1,000 litres of biodiesel a year. „The grand plan is to use either straight jatropha oil or biodiesel as fuel in power plants managed by PLN, the state electricity company, to replace fossil-fuel-based plants," says Nyoman Iswarayoga of Yayasan Pelangi Indonesia, a non-governmental organisation working on climate change and energy issues. „Since carbon dioxide emissions will be reduced as a result, the Clean Development Mechanism (CDM) could be used to support investment in jatropha-based fuel production," Iswarayoga adds. The CDM is

a provision of the UN climate change convention that allows industrialised nations to offset their emissions of greenhouse gases by investing in non-polluting projects in developing countries.

Seeds of change

Staring in their second year, jatropha trees can produce seeds for more than 30 years. Each mature tree produces between five and 15 kilograms of seeds, three times a year. „If you have very good conditions — soil, water, plants — you could get 5,000 kilograms of seeds per hectare per year, which can give 1,500 litres of oil per harvest," says Reinhard Henning, of the Germany-based Jatropha Information Service. „If the soil is not so good, you might only get half that." Extracting the oil is a simple process, and cars do not need to be modified to use the resulting biodiesel. In fact, Rudolph Diesel himself had vegetable oil in mind when designing the engine that carries his name.

Cutting the carbon

„The use of vegetable oils for engine fuels may seem insignificant today," said Diesel in 1912. „But such oils may become in the course of time as important as petroleum and the coal tar products of the present time." Many think that time will soon be upon us. The global market for biodiesel is being shaped by international energy policy and a growing acceptance that reducing emissions of greenhouse gases will limit climate change. Unlike petroleum, jatropha oil is renewable and biodegradable. Burning it, or biodiesel made from it, is cleaner than burning fossil fuels as it produces a fraction of the carbon dioxide — the main greenhouse gas responsible for climate change. Carbon dioxide emissions resulting from the production of biodiesel from jatropha plantations are likely to be less than 15 per cent compared to petrol-diesel, according to a March 2005 paper in *Natural Resources Forum* by George Francis and colleagues at Germany's University of Hohenheim. The European Union (EU) has set a target of using 10.5 billion litres of biodiesel by 2010 — double what Europe itself s projected to be able to supply. The 2001 *Study of the European Biodiesel Market* by international consultancy firm Frost & Sullivan says the EU market for biodiesel could be worth US$2.4 billion by 2007.

Food vs. fuel

But critics of biofuels are as vocal as their advocates. One concern is that, globally, there will be a trade-off between using land to grow food and using it to grow fuel. „If biofuels take off, they will cause a global humanitarian disaster," said environmentalist and writer George Monbiot in a November 2004 article in UK newspaper *The Guardian*. Monbiot argued that vast tracts of agricultural land in developing countries would be used to produce biodiesel for car-loving nations instead of food for the poor. „People who own cars have more money than people at risk of starvation," he wrote. „In a contest between their demand for fuel and other people's demand for food, the car-owners win every time."

Others say that the energy, water and other inputs needed to grow biofuel crops exceed the energy value of the fuel produced. According to research published in July 2005 by David Pimentel of Cornell University and Tad Patzek of the University of California, Berkeley, producing biodiesel from soybeans requires 27 per cent more energy than the biodiesel generates — and the source of the energy used is polluting fossil fuels. For sunflower biodiesel, the figure is 118 per cent.

But jatropha can grow on poor-quality land unsuitable for food crops and needs little water or fertilisers. Nor does it need pesticides. In fact, jatropha deters pests — birds, mammals and insects do not eat it. Pimentel says jatropha „sounds interesting and appears to have potential. I like the idea of controlling soil erosion and increasing the habitat for wild animals."

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Seabuckthorn

When I was Plantations Officer in the FAO Forestry Department, I made a number of project backstopping trips to China between 1991 and 1999. One of the most interesting of the projects was concerned with the development of Seabuckthorn (*Hippophae rhamnoides* or Sha-ji in Chinese).

The natural geographic range of Seabuckthorn is from China in the east, through India and Russia to the United Kingdom in the west, and its altitudinal range is from the mountains of Tibet to sea level in Europe. In Britain and Denmark it is a shrub, occurring naturally on coastal dunes, used sometimes as an ornamental in gardens because of its showy red berry. But in China it is a plant of extraordinary importance; it is used for soil conservation and site rehabilitation because of its tolerance of drought and infertile or saline soils, it yields a useful firewood, it shelters crops and animals in harsh conditions, and the berry is extremely rich in Vitamin C and in an oil with various real or imagined medicinal properties.

There are great differences in the growth and other attributes of the different seed sources or provenances and because of this genetic diversity the wild populations are of great importance for breeding and improvement of the species in cultivation. Trials of about ten provenances replicated in various sites in China showed striking differences in growth of the shrub and yield of the berries, and even in the concentration of Vitamin C in the berries.

I recall a couple of little stories in connection with the species. The first concerns Sha-ji oil, which provided a little known footnote in the history of space travel. It was used as a vitamin supplement in the diet of astronauts in the Russian space programme, its use for this purpose being a closely guarded secret for twenty years during the space race of the 1960s and 1970s. During that time high-yielding varieties were developed in Russia as part of the national space programme.

The second little snippet of interesting (if useless) information concerns the reputed property of the oil to give a healthy sheen to horses' coats, hence the botanical name *Hippophae* from the Greek *hippo* meaning horse, and *phae* from *phaethon*, shining.

My early visits were concerned with the provenance trials, but my final visit was in connection with the establishment of an institute that was set up to coordinate work on the development of the species, to implement conservation measures and publicize the threats to the species from uncontrolled clearing and grazing, and to promote the international exchange of germplasm.

Jim Ball

Poplars and popular belief

I've recently been engaged in drafting a chapter on Natural Poplar Ecosystems for the revision of the authoritative but long out-of-print FAO publication *Poplars and Willows*. One of the benefits arising from the extensive literature search that I've carried out on all the poplar species has been a few gems quite unrelated to the topic I was supposed to be studying and I thought I would share them with readers of the *CFA Newsletter*.

Poplar Culture in North America is particularly rich in poplar anecdotes. On the one hand the genus has been revered and esteemed - White poplar (*P. alba*) was linked with the Greed deities Hercules and Persephone, while a poplar tree cured Hurcules of a sepent's bite – while on the other hand in Christian legend aspen (*P. tremula*) provided the tree from which the Cross was made, and from which Judas Iscariot is said to have hanged himself[1]; the disgrace caused the tree to shudder and tremble ever after. This belief was evidently so powerful that 19th century lumberjacks in the Great Lakes region refused to sleep in cabins made from aspen logs – although in this case the species must have been *P. tremuloides*. Furthermore, in the Victorian 'language of flowers' aspen symbolised scandal, lamentation and fear.

Dickman (2001) notes that Black Cottonwood (*P. tricocharpa*) was believed by some tribal groups in the north-west of the USA to be an omen of the weather; when the leaves shimmered and no wind was perceptible, then bad weather was surely on the way.

Dickmann (2001) discusses the vegetative propagation of *P. tremuloides* and notes that certain western quaking aspen clones may be 10 000 years old or more, having become established from seed after the Pleistocene glaciers receded. This subject, he states, can become quite metaphysical as some people actually consider western aspen clones to be immortal.

Even Psalm 137 has a poplar link. Verse 2 reads 'We hanged our harps upon the willows...' when the oppressors of the Children of Israel ordered them to sing. In fact the juvenile leaves of *P. euphratica* are quite slender, like willow, and this may have led the Psalmist to mistake the Euphrates poplar trees for willows (M'Hirit 1994).

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Jim Ball

Student notes

Forests for the People: maintaining a balance

The International Forestry Students' Symposium 2005

*By **Samantha Citroen**, University of Melbourne, Australia, on behalf of the IFSS 2005 Organising Committee*

Forestry students from the University of Melbourne and the Australian National University were proud hosts of the 33rd International Forestry Students' Symposium, Australia, 14-28th August 2005. The symposium is an annual event of the International Forestry Students' Association (IFSA), and brings together forestry students from around the world to both share information and create opportunities to participate internationally in forestry events and issues.

The theme of the symposium; *'Forests for the Future, Maintaining a Balance'*, aimed to explore issues associated with forest management and the paradigm shift from timber production, to managing forests for a multiplicity of values. The event proved both exciting and challenging as forestry 'the Australian way' was presented to around 100 forestry student from over 50 corners of the globe.

Forest management for a range of values, unique in their Australian context, was covered through a wide variety of field trips and presentations. Production forestry was show-cased through visits to both native and plantation harvesting coupes and the Neville Smith timber mills in Victoria's East Gippsland. Social values were explored in visits to Victoria's first community forest management trial in the Wombat State Forest and a special day hosted at the Aboriginal Darnhya Centre in the Barmah forest, giving first-hand insight into Indigenous Forest Management issues. Management issues associated with forest fires in Australia were also emphasised and ACT Forests hosted a full-day tour in which students learnt the impacts and issues of major wildfires. The comparative differences in management practices internationally, familiar to each student, were keenly expressed and explored by participants with wide ranging questions and views.

The symposium also offered a prime opportunity for students to present their studies and discuss issues relevant to their own countries, which was facilitated by both informal discussions and individual student presentations during workshop sessions. These presentations covered a wide variety of subject areas from Conservation reserves in Brazil to Harvesting systems in South Africa. As part of an IFSS tradition a cultural night was also held, full of food, song, fun and dance brought from all over the world by our participants.

The success of this IFSS was reflected in an increased awareness and understanding of the students towards their fresh experience in a broad range of values that people place on forests. This knowledge is invaluable in assisting them in their future careers as forest managers. The organising committee would like to thank all of our Australian sponsors without whose support this unforgettable experience for so many students could not have been possible.

1. But the Judas Tree, *Cercis siliquastrum*, is also reputed to be the tree from which Judas hanged himself, because of its horizontal branches.

Around the world

Major floods 'not linked to deforestation'

There is no link between deforestation and the large-scale floods that cause widespread death and devastation, say researchers in a report issued on13 October. The release of the report, which says the media have got it wrong, coincides with major flooding in Central America caused by Tropical Storm Stan.

Several media outlets and environmental groups have said that the death toll in Central America, now approaching 1,000 people, is higher than it would have been if fewer or no trees had been cut down. Reuters reported on 6 October that Greenpeace had said „the flooding in Mexico was made worse by deforestation, as water rushed down bare hillsides". But David Kaimowitz, director-general of the Center for International Forestry Research (CIFOR), which published the report with the UN Food and Agriculture Organisation, says it is all a matter of scale. No amount of trees would have been able to stop the vast amount of dirt that needs to move to make an entire village disappear, he says.

Kaimowitz says that scientists' rule of thumb is that „if landslides are deeper than one metre, trees are not going to make a difference". According to the report, it is a myth that forests reduce the risk of major floods by acting like a sponge that soaks up rainfall and slowly releases it to lower-lying areas. The ‚sponge' effect depends on the depth and structure of soil, and the extent of rainfall — not just the presence of trees, explain the authors.

Major floods, they say, follow intense rainfall that even forests cannot absorb because their soil gets saturated. The report accepts that since deforestation became widespread in developing countries, major floods have cost more lives, but says this is because more people now live and work in flood plains. The number of major floods has not changed since the 19th century when forests were abundant throughout the tropics, it says.

According to Reuters, Greenpeace says the flooding in Central America „underlines the importance of conserving eco-systems, particularly forests and mangroves, to prevent the impact of hurricanes." Kaimowitz, however, says that „planting trees and protecting forests can have many environmental benefits, but preventing large-scale floods is not one of them". But he adds, „we are not saying that developing countries should de-prioritise planting trees. In addition to producing valuable forestry products, trees can store carbon, reduce soil erosion, and help to maintain biodiversity."

Kaimowitz says the media and environmental groups need a better grip on science. „Society will always have to make difficult decisions about which forests should be cleared or logged and where trees should be planted," he says. These decisions should be „based on the best scientific evidence available," he adds. He says the media and environmental groups „should not be making claims that most scientists would agree are simply not true."

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Logging does not raise flood risk

Deforestation and logging do not increase the risk of major floods, according to a new report. The UN's Food and Agriculture Organization (FAO) and the Center for International Forestry Research (CIFOR)the evidence shows no link. Loss of forest cover does play a role in smaller floods and in the loss of fertile topsoil, it says. It accuses Asian governments of blaming floods on small-scale loggers and farmers to deflect criticism.

Widespread but wrong

The belief that deforestation causes major floods and increases the damage which they do appears to be widespread. hina's catastrophic floods of 1998, when the Yangtse and Yellow rivers broke their banks, were linked by Chinese officials to deforestation; the environmental group WWF and the Red Cross also drew a causal connection. Italian politicians made similar statements after mudslides near Naples killed nearly 100 people in the same year.

But the FAO/CIFOR report cites evidence from Bangladesh, Nepal, South Africa, Thailand and the US showing that the frequency and extent of major floods has not changed over the last century or two, despite drastic reductions in forest cover. „I think the belief comes about because forests do help to reduce floods in small areas, and so people assume it must also apply to severe floods in large areas," said CIFOR's director-general David Kaimowitz.

„But our sense is that in general the conclusions of scientific studies indicate that changes in land use and land use cover have only a minor role in large-scale flooding events," he told the BBC News website.

Natural barrier

On a smaller scale, forests act like sponges, soaking up excess water. Water can spread out and be absorbed in surrounding forest soil; but when all the woodland is inundated, the ground simply does not have enough capacity.

Reports of the recent floods caused by Hurricane Katrina and Tropical Storm Stan in north and Central America have suggested that vegetation formed a natural barrier to flood water.

Research has shown that during last December's Asian tsunami, coastal zones with intact mangrove swamps fared better than other areas. „Those studies come mainly from Sri Lanka," observed Dr Kaimowitz, „and the tsunami had to go all the way across the ocean to get there. „I have been in Aceh where you had waves 20m high - no mangrove is going to stop that."

The report does acknowledge, however, that forests can safeguard natural resources by binding soil and preventing it from being washed away. This has been a particular factor in Haiti, which has lost more than 90% of its original forest cover,

tying into a cycle of poverty and environmental degradation which sees the poorest people in the Americas scrambling to exploit what land is left, often unsustainably, which then leads to further soil loss during the next flooding event.

Blame game

Professor Edmund Penning-Rowsell, head of the Flood Hazard Research Centre at Middlesex University in London, UK, believes the FAO/CIFOR conclusions are broadly correct. „There is an effect from forests," he told the BBC News website, „but it disappears as you get to larger and larger scales. „People tend to up-scale their ideas from personal experience; but you can't scale up from local floods to something like the Ganges. „Most floods are caused by people building in the wrong places; and Bangladesh for example is almost entirely built on a flood plain, which is very fertile but does carry a big risk."

He also concurs with the report's view that governments look for scapegoats after a major flood to deflect criticism from their own failings. FAO/CIFOR say that Asian governments in particular have curbed small-scale logging and land clearance by local people without justification. „You have to be very careful before taking repressive measures against small farmers on hillsides or small-scale logging activities, because you're destroying peoples' livelihoods," said David Kaimowitz.

„The most extreme case was the logging bans established in regions of China following the floods of 1998 which put more than a million people out of work, when it's almost certain that logging played very little role in the floods.

„Sometimes one gets the impression that governments don't want to consider whether they should have warned people, evacuated people, made sure they're not so poor that they have to live in vulnerable areas."

Floods on the rise?

These are issues which are unlikely to disappear soon, as the incidence of floods with major loss of life appears to be rising rather than falling. As the FAO/CIFOR report makes clear, this is partly due to the growing global population and the consequent expansion of human settlements into areas which had once been marginal. As a result, each flood claims more lives than it would have done a century ago. Also, it says, human diversion of watercourses has changed the pattern of floods, often moving a problem from upstream to downstream areas.

But Edmund Penning-Rowsell believes that there may be another factor - that the true frequency of floods is beginning to increase. „It does appear that large floods are becoming more frequent," he said. „It might take us 100 years to find out for sure - but there does seem to be a tendency in that direction."

news.bbc.co.uk

Selective logging 'doubles Amazon forest loss'

Researchers have managed to count the uncountable in Brazil's Amazon rainforest. In a study published today, they show using satellite imagery how much of the forest is ‚selectively logged' for mahogany and other trees. The team says that deforestation figures for the Amazon should be doubled to take account of this form of logging, which involves felling only those trees that are valuable in the timber trade.

„Mahogany is the one everybody knows about," explains lead researcher Gregory Asner of Stanford University, United States. „But in the Amazon, there are at least 35 marketable hardwood species, and the damage that occurs from taking out just a few trees at a time is enormous." According to Asner: „On average, for every tree removed, up to 30 more can be severely damaged by the timber harvesting operation itself. That's because when trees are cut down, the vines that connect them pull down the neighbouring trees."

Compared with deforestation, where large areas are burnt or cut down to make way for agriculture, the environmental impact of selective logging „has been mostly invisible until now", he says. Efforts to monitor selective logging have so far used imprecise methods. These include surveys of sawmills that do not reveal where the logs originated, or labour-intensive — and potentially dangerous — fieldwork to count felled trees. None of these methods is effective for large-scale assessments.

In research published recently in *Science*, Asner and colleagues used ultra-high-resolution satellite data to measure the amount of selective logging in the five states where about 90 per cent of the deforestation in Brazil's Amazon has occurred. „With this new technology, we are able to detect openings in the forest canopy [left by] just one or two individual trees," says Asner. His team found that from 1999 to 2002, between 1.2 and 2 million hectares of forest were selectively logged each year. The upper limit corresponds roughly to the combined area of Jamaica and Puerto Rico.

The selective logging that Asner's team recorded totals 60–123 per cent more forest damage than was reported for deforestation alone in the same period. The findings have implications for climate change, as the researchers say the additional logging caused a 25 per cent increase in carbon released to the atmosphere, compared to the amount arising from deforestation alone. Generally, the researchers found that protected areas were not logged. However, there were notable exceptions in Mato Grosso and Pará, the two states where selective logging was most intense.

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UK top of the pile in illegal logging scandal

The UK is the biggest importer of illegal timber in Europe, fuelling the destruction of the world's most important forests and exacerbating poverty in some of the poorest countries, a new report from WWF has found.

Failing the Forests - the EU's Illegal Timber Trade, shows that the UK trade is responsible for the destruction of around 600,000 hectares of forests each year - nearly three times the size of Luxembourg.

The report, which focuses on the trade between EU countries and the Amazon Basin, the Congo Basin, East Africa, Indonesia, the Baltic States and Russia, found that the EU is responsible for around €3 billion of the global €10-15 billion in lost revenue due to illegal logging each year. As Ministers meet to consider measures to tackle illegal logging in Brussels

today, WWF is calling for new EU wide legislation to prohibit the importation of illegally logged timber.

Andrew Lee, Director of Campaigns for WWF, said: „The UK has made poverty a central plank of its EU presidency yet its consumption of illegal timber is robbing countries such as Cameroon and Indonesia of invaluable income. Large scale illegal logging often deprives local communities who rely on forests for their livelihoods, whilst big international companies reap the profits."

Failing the Forests says that the EU trade could contribute to large scale depletion of timber in some areas and loss of forests, especially in the Congo and Indonesia, in 10 years time. Each year the EU imports roughly 20 million cubic metres of illegal timber from the six key forests the report focuses on.

Whilst the UK is the biggest importer of illegal timber in Europe, when both illegal timber and pulp and paper are combined it is the third worst in Europe, behind Finland and Sweden respectively.

WWF believes current EU proposals to tackle illegal logging are inadequate. The Forests Law Enforcement Governance & Trade (FLEGT) Action Plan, which promotes voluntary agreements between the EU and timber producer countries, has a number of critical loopholes. It does not prevent timber being imported into the EU through third countries such as China and it also doesn't include all types of timber - pulp, paper and furniture all being excluded from the scheme.

WWF is also calling on the EU to take far more active steps to encourage other major producers such as China, Japan and the US to eliminate illegal timber from their own imports.

Beatrix Richards, Senior Forests Policy Officer, said: „The UK must use its influence to ensure the EU takes much tougher action to eliminate the illegal timber trade. Failing to do so is failing the forests"

www.wwf.org.uk

A response to *Failing the Forests*

In an effort to improve the level of debate on the issue of illegal logging Forest Industries Intelligence Limited (FII) has undertaken an independent assessment of the WWF *Failing the Forests* report, published last week, which alleged high levels of illegal wood imports into the EU. The FII assessment suggests that the data used by WWF is inadequate, that their methodology is flawed, and that their conclusions are misplaced. A copy of the assessment is attached.

The Forest Industries Intelligence report questions the assumptions used by WWF to produce high estimates of illegal wood product imports into the EU. The WWF's results are dependent on a controversial definition of illegal logging. It also indicates that the approach adopted by WWF fails to acknowledge recent efforts by the importing industry to improve traceability of imported wood products and to filter out illegal material from supply chains.

The FII report questions the key WWF recommendation that „as a matter of urgency the EU must develop legislation which prohibits the import of illegal timber and wood products into the EU." On the basis of FII's alternative analysis of trade data and levels of illegal logging, FII concludes that the approach currently adopted by the EU Commission may well be the most effective and efficient policy response. This approach involves targeting resources to a limited range of supply countries where illegal logging is particularly pronounced through voluntary partnership
agreements. FII recommends that this should be combined with wider adoption of independently audited environmental procurement policies by importing companies, incorporating supplier risk assessment procedures.

The FII report suggests that any move to tighten EU import legislation should follow a well informed debate on the appropriate definition and scope of illegal logging. This debate should take into account a realistic assessment of the leverage that may be applied by the EU importing trade over different aspects of illegal logging. There is also a need to broaden the scope of discussions to accommodate a wider range of secondary and finished wood products.

[Forest Industries Intelligence Limited is an independent UK-based consultancy serving a range of clients in the international forest products sector. Areas of expertise include: forest industry market intelligence; marketing and promotion; environmental issues; forest policy and sustainability; and international trade issues. Our staff have extensive contacts with the international timber trade and forestry community. The company publishes the hardwoodmarkets.com newsletter. More details are available at http://www.hardwoodmarkets.com]

Deforestation slowing - UN

The speed of global deforestation is showing signs of slowing down because of new planting and natural forest extension, according to new figures. But the world's forests are still being destroyed at an alarming rate, says the UN Food and Agriculture Organization, presenting details from a new report.

The numbers measure net loss, taking into account forest growth from new planting and natural expansion. An average 7.3 million hectares was lost annually over the last five years. This was down from 8.9 million hectares (22 million acres) a year between 1990 and 2000. „The deforestation continues at an alarming rate, but thanks to efforts in planting new trees and restoring degraded lands as well as natural [forest] expansion in some regions, the net loss is a little lower," said Mette Loyche Wilkie, co-ordinator of the agency's Global Forest Resources Assessment 2005. Ms Wilkie said that deforestation, mainly the conversion of forests to agricultural land, continued at a rate of about 13 million hectares (32 million acres) per year.

Alarming loss

More than half of the world's forest area is found in the Russian Federation, Brazil, Canada, US and China combined, the agency said. The decrease of forest area was mainly due to deforestation or natural disasters that made the land incapable of regenerating on its own, Ms Wilkie said.

The five-year report, which covered 229 countries, found that forests cover about 30% of the total land area; nearly four billion hectares (9.9 billion acres). Deforestation was most extensive in South America, where an average of 4.3 million hectares (10.6 million acres) were lost annually over the last

five years, followed by Africa with 4 million hectares (9.8 million acres), the Rome-based agency said.

North America and Oceania saw smaller forest losses over the same period, while forest areas in Asia and Europe grew, according to the FAO. „There's reason to be very optimistic," said Hosny El-Lakany, the agency's assistant director-general for forestry. „Deforestation is going down and, maybe, it will go further down in the future," he said.

A number of different functions of forests make them a crucial component of the Earth's biosphere. They conserve biological diversity, soil and water and also serve as carbon sinks - locking up the greenhouse gas carbon dioxide. The amount of carbon stored in forest biomass alone is about 283 gigatonnes (Gt). The carbon stored in forest biomass, deadwood, litter and soil together is roughly 50% more than the carbon in the atmosphere.

news.bbc.co.uk

Oil boom fuels bushmeat trade

The bushmeat trade in Equatorial Guinea is thriving thanks to a recent boom in oil, research has suggested. The Zoological Society of London (ZSL) says people buy bushmeat because they have more money to spend and there is not a good alternative source of meat.

Increased hunting is pushing species like the black colobus monkey to the edge of extinction in populated areas. The ZSL says an improved production of domestic meat could take the pressure off endangered species. „The bushmeat trade now poses a very real threat to a wide variety of species," said researcher Noelle Kumpel of the ZSL. „In order to make the trade sustainable we need to understand why people eat bushmeat in the first place - in other words, whether it is choice or necessity - before we can contemplate managing the issue."

Complex web

Noelle Kumpel spent 18 months in Equatorial Guinea, West Africa, investigating why people hunt wild animals and what effect it has on local species. She found that hunting is increasing for a variety of reasons. In the village of Sendje, where she stayed, the number of animals caught has increased from around 2,000 a year in 1997 to over 8,000 a year in 2003. Partly, this is because consumer demand is growing, and partly because hunting methods have become more sophisticated.

Equatorial Guinea's crude oil production has risen from next to nothing in 1995 to around 350,000 barrels a day in 2004, making it sub-Saharan Africa's third largest producer, after Nigeria and Angola. „The general population are moving to the cities and have more money," explained Miss Kumpel. „People can now afford to buy meats and fish - so demand is increasing. And people are hunting to meet this demand." Ironically, Equatorial Guineans do not necessarily prefer bushmeat to domestic meats like chicken or beef but these are hard to come by, according to Miss Kumpel. „They choose bushmeat because it is one of the few sources of available fresh meat or fish," Miss Kumpel told BBC News Online. „There is frozen meat but they do tend to get the dregs of frozen produce. „It is usually quite low quality cuts that we would put in dog or cat food in the UK." So consumers opt for fresh bushmeat, even though it costs more.

Snares, traps and guns

For people living rural Equatorial Guinea, far away from the flourishing oil industry, eking out a living is hard. For many, the bushmeat trade is their only source of income. But traditional snares and traps are giving way to guns, and some species are declining dangerously as a result. Arboreal primates, like the black colobus monkey, are particularly susceptible to firearms. „The black colobus monkey has basically been wiped out around the village of Sendje," said Miss Kumpel. „It is easy to catch and it is a big bodied species that is slow to reproduce, so it is easy to decimate quite quickly."

The ZSL recognises that because people's livelihoods depend on the bushmeat trade, banning hunting outright is not a viable solution. Dr Glyn Davies of the ZSL said: „I think we have a better chance of having an impact if we stop trying to say ban it all and just alienating everybody. We can give support in a number of ways." The ZSL would like to help Equatorial Guinean hunters turn their skills to farming and fishing, so consumer demand could be met while livelihoods are protected. „To tackle the demand end you need to improve the rearing of livestock or improve local fish," said Miss Kumpel. „In addition some form of alternative livelihood needs to be developed for the hunters - which could take the form of livestock husbandry."

news.bbc.co.uk

Hurricane Katrina blows Brazilian exports up

Concerns over short-term supply shortages in the aftermath of Hurricane Katrina prompted some US wood products importers to fulfill immediate needs with imports. As a result, new contracts with Brazilian exporters have increased, causing a rise in price of pine plywood, the main exported product of the Brazilian forest sector. Prices have climbed by 20-21% despite the 8% import duty in effect in the USA.

Brazil accounts for 40% of the plywood used in civil construction in the Eastern US region affected by the hurricane. Reconstruction work is forecast to begin in October-November, but high demand has already pushed the prices of the Brazilian plywood up. The price hikes have initially benefited Brazilian companies with significant plywood stocks stored in ports and warehouses in the USA. According to the Brazilian Association of Mechanically-Processed Wood (ABIMCI), the forecast of plywood sales to the USA was increased as a result, from 800,000 m^3 to 1 million m^3 in 2005, as compared with a total 971,200 m^3 exported

in 2004. The high demand has taken many Brazilian timber companies by surprise that had drastically reduced production level, laid-off staff and even closed some operations in the past few months due to rising raw-material costs and the strength of the Brazilian currency. This has reduced the sector's capacity to respond to the short-term demand and new orders from the

USA.

Compensados Guararapes Co, Brazil's largest pine plywood exporter, has already committed to the USA all of its future plywood production (60,000 m3 per month) for 2005. As the price is paid at delivery time, Brazilian exporters expect to benefit from the price increases. *Masisa do Brasil*, a Chilean company located in Southern Brazil which exports OSB for packing and civil construction, has seen a price increase of US$7 per m^3 to US$280/m^3. Recent estimates have pointed out that the forests damaged by Katrina in the States of Mississippi, Louisiana and Alabama cover an area of 12.85 million ha (about 5.4 billion m^3), equivalent to two years of harvesting (60% softwoods). Part of this volume will likely affect the domestic and exports supply and demand balance of forest products.

ITTO-MIS's *Tropical Timber Market Report*

Forests flushed down the toilet

The major tissue manufacturers are not offering enough recycled toilet paper, towels and napkins to European consumers and must be more responsible when sourcing their wood, according to a new WWF report. The global conservation organization says this clearly contributes to the wasteful use of forests, at a time when they are threatened worldwide.

The new report analyzed the practices of the five largest European tissue manufacturers – Procter and Gamble, SCA, Kimberly Clark, Metsa Tissue, and Georgia Pacific – which together supply about 70 per cent of the European market. It found that the vast majority of tissue products these companies are selling to European households contain alarmingly low levels of recycled fibres. As a result high-quality virgin fibres are taken directly from natural forests and plantations around the world, including Latin America, Canada, the US, South Africa, Russia, Asia, and Europe, and end up as waste without the consumer's knowledge, WWF says.

The European tissue business is worth around 8.5 billion Euros annually and accounts for 26 per cent of global tissue consumption, with each European using 13 kg – the equivalent of approximately 22 billion rolls of toilet paper. "Everyday about 270,000 trees are effectively flushed down the toilet or end up as garbage around the world, such a use of the forests is both wasteful and unnecessary," said Duncan Pollard, Head of the European Forest Programme. "Manufacturers must use more recycled fibres in their tissue products, as this means fewer trees will be cut down."

Toilet paper and towels in offices, schools, and hotels are mostly made out of recycled fibres, and there is no reason why it should be any different for the same products that are sold in supermarkets, WWF says. Manufacturers argue that retailers mainly want non-recycled products because this is what consumers are asking for. "Consumers have no idea that they may be threatening the world's forests when they go to the bathroom," said Pollard. "It's a myth that recycled tissue products are not of a high quality. After all, people use recycled tissue products most of the day when they are out of their homes anyway."

According to WWF, the companies also need to better inform consumers about the recycled content of their products. Consumers should not be misled by recycling symbols on tissue packaging which often only refer to the wrapping paper, and not to the product itself.

WWF recommends that consumers look and ask for the few recycled tissue brands currently produced by the five major manufacturers as well as brands from smaller companies for which recycled products are a niche market. Consumers should also ask shops and supermarkets to stock recycled tissues.

The report also warns that unsustainable timber harvesting, illegal logging and land right conflicts still exist in many of the countries from where the virgin fibres are sourced. WWF says that the companies are showing promising intentions to effectively track the timber from the forest to the product, but so far, only SCA Tissue has taken effective measures to exclude illegal or controversial timber from their tissue products.

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WWF Press Release

Africa's rainforests for the chop in world's biggest illegal giveaway

New information obtained by the Rainforest Foundation shows that vast areas of the world's second largest rainforest - in the Democratic Republic of Congo - is being handed out illegally to timber companies by the Congolese government.

Official information published in November reveals that nearly 150,000 square kilometres of forest (an area the size of England and Wales) has been allocated to timber companies within the last three years, mostly during 2005. The opening up of new areas of rainforest for timber felling has been illegal in the Congo since May 2002.

In early November 2005, the President of Congo signed a decree re-stating the moratorium on new logging activities, but the new information shows that the existing ban has been completely ineffective.

In December 2005, the World Bank will consider approving a new credit of $90 million to the Congolese government, some of it to finance new forestry activities.

Simon Counsell, Director of the Rainforest Foundation, said: „The Rainforest Foundation has been warning for several years that the timber industry in Congo is about to spiral out of control, and that international pressure should be brought to bear on the Congolese authorities to stop the handing out of vast concessions to logging companies. The Congolese government has acted in defiance of its own laws, and is set on a course that could have disastrous consequences for the many millions of people, as well as the wildlife, that are dependent on the country's forests. The World Bank should make it a strict condition of any new funding for forestry in DRC that all the illegally allocated concessions are immediately cancelled".

Rainforest Foundation

Publications

Prospects for high-value hardwood timber plantations in the dry tropics of northern Australia

Proceedings of a workshop held 19-21 October 2004, Mareeba, Queensland Australia. Published as a CD ROM by Private Forestry North Queensland Association Inc., Kairi, Queensland. Available gratis from David Skelton, Executive Officer PFNQ PO Box 27 Kairi Qld 4872 Australia david.skelton@pfnq.com.au

Review by ***Roger Underwood***

Background

Experience has shown that for a new forest industry to move efficiently from the exploratory phase to commercial reality, four imperatives must be addressed:

(i) *Vision and leadership*: real, practical and commercial opportunities must be identified - projects which will meet actual market needs, work in the proposed environment and in the social and economic climate of the time and place.

(ii) *Encouragement:* incentives must be identified which will help to attract investment, resolve technical problems, enhance growth and development and lead to a self-sustaining industry-driven commercial enterprise capable of operating without direct financial input from governments.

(iii) *Efficiency:* policy, administrative or legislative constraints/barriers to the start-up and growth of new forest industry must be identified, and removed or minimised.

(iv) *Accountability:* potential impacts and risks associated with forestry and processing must be identified and appropriate measures put in place from the outset to ensure that the industry responsibly addresses (and is seen to address) the needs and expectations of the wider community.

The recent (1990 – 2004) rapid expansion of the forestry plantation industry on private land in temperate Australia provides insights into situations where these imperatives have (and have not) applied. For example, the new industry was initially able to benefit from significant government input in the form of early R&D, but it then developed in the absence of overarching strategic guidance or coordinated industry development planning. Thus, the expansion of the sector has frequently been inefficient, and has attracted criticism from some quarters, especially from those associated with concerns about the impact of plantations on rural communities or the environment.

Moreover, the new plantation industry has developed unevenly and sub-optimally, both in terms of target markets and national benefit. Two obvious deficiencies have emerged. The first is that the emphasis has been placed on production of high volume/low value products (pine sawnwood and softwood pulp, and eucalypt pulp); the second is the lack of focus on development of a viable plantation industry targeting high value tropical timbers in tropical northern Australia.

A conference on high value hardwood timber plantations for northern Australia was needed, and is timely, for two reasons:

Supply and demand factors

The declining supply and increasing value of tropical hardwood timbers provides a significant and rapidly expanding opportunity for Australian forest growers. While production and trade in tropical hardwoods is small in terms of the international timber industry, it is economically significant and services lucrative global markets for high value finished products. For example, in 2002 the global value of tropical hardwood timber exports was $US 8 billion. In addition, the unit price for tropical timbers can be very high. In 2002, prices for sawn teak and mahogany reached $US 2400 per cubic metre; this compares with average prices of $US 342 per cubic metre for sawn softwoods.

Despite their value, the production and export of tropical timbers from major producers shows a strong downward trend. This is due to a range of factors, including shrinking resources of tropical native forests, conservation pressures (including CITES listing of species such as American mahogany), pressures on importing industrialised countries to source only from sustainably managed/certified operations, and the policies of some previously exporting tropical countries to restrict exports of native timbers. In many tropical countries there has also been a general move to onshore processing and export of partially finished products, for example sawn timber, veneers and plywood, in place of raw log exports.

Not surprisingly there has been an upsurge in the establishment of plantations of high value hardwoods in some tropical countries (for example Malaysia and the Philippines) to replace harvest from native forests and take advantage of the lucrative trade opportunities. In recent years it is believed that around 5 million hectares of plantations of prime high value hardwoods, including Tectona, Swietenia, Dalbergia, Gmelina, have been established. The quality of these plantations is variable, and in many cases it is not expected that they will contribute significantly to international trade in roundwood, sawnwood or panels, especially for the most highly sought-after species such as African mahogany and Teak. This is because in most of the countries with new tropical timber plantations, the national emphasis is on the export of high-value finished products such as furniture and specialty products.

All supply and demand facts thus reinforce the opportunity for Australia to grow high quality plantations of tropical hardwoods, with an eye to the export market.

Geophysical and social factors

Australia is well placed geographically, socially and technically to develop a viable plantation industry built on tropical hardwood timbers. Tropical Australia has significant land resources with conditions suitable for hardwood plantations in both the wet

and dry tropical regimes. In the case of the Ord River Irrigation Area in Western Australia, there is a vastly under-utilised source of irrigation water, highly fertile soils and a well-established horticultural industry, while in North Queensland the growing economic problems for the tropical agriculture is likely to see fertile land close to ports becoming available for high value timber plantations. In addition, Australia has a high level of political stability and extensive experience and expertise in growing commercial plantations. This is coupled with a rising interest in tropical agroforestry among farmers and landholders, including aboriginal communities with extensive landholdings willing to get involved in forestry pursuits.

Furthermore, as discussed above, Australia has learned many lessons from the rapid expansion of the hardwood plantation sector in temperate regions, and these lessons can be applied to new plantation developments elsewhere, for example in the north.

Existing information and experience

To date plantation projects involving high value tropical hardwoods in northern Australia have been confined to Indian sandalwood at the Ord River and to a range of research trials and experimental plantings of other species, particularly in Queensland and the Northern Territory. All of this work has confirmed the high potential of plantations in northern regions, and a number of potentially suitable trees with high value timber have been identified. But experience has also demonstrated the range of difficulties faced by potential plantation growers in these areas. These include the lack of long term silvicultural information, the embryonic state of genetic improvement for key species, the logistical and economic problems associated with remoteness, distance from markets and in some cases restrictive government policy settings.

In addition, the 'dry tropics' have a harsh climate with a long dry season and a high variability in rainfall from one year to the next; drought years are not uncommon. The soils in general are fragile and infertile. Thus the success of forestry projects will be closely tied to factors such as access to ground water or irrigation, and the application of sound nutritional programs.

The Mareeba Conference

The conference at Mareeba in October 2004 that is the subject of this review was convened as a forum for consideration of all these issues. The conference purpose is appositely summed up in its title: "Prospects for commercial plantation development in the dry tropical areas of northern Australia using high value tropical hardwood species". For the purpose of the conference the term "dry tropics" was used to describe the vast area (nearly 2 million square kilometres) of woodland and savannah stretching across north Queensland, the Northern Territory and the Kimberley region of Western Australia, an area characterised by a hot, generally wet summer and a long warm dry winter. The dry tropics receive on average about or less than 1200 mm rainfall annually. This area is sparsely populated, with the main industries being pastoralism, mining, tourism and (where water is available) irrigated horticulture. Traditionally, commercial forestry has played almost no role in any part of the dry tropical region.

The conference was organised by Private Forestry North Queensland, and was sponsored by the Federal, Queensland and Northern Territory governments, the Joint Venture Agroforestry Program and the Australian Forest Growers. It drew participants and speakers from across Australia, and these represented the full spectrum of interests from scientists and academics to industrial and farm foresters. A pre-conference tour provided non-Queenslanders with a practical perspective into the climate, soils, and likely species for tropical timber plantations in northern Australia and a field day took participants to a waste-water irrigated plantation, sandalwood and eucalypt provenance and genetic trial plots and to a state-of-the-art clonal nursery.

The Mareeba conference dealt with both the opportunities and the challenges for a new plantation industry. In doing so, the conference may well in time come to be regarded as a milestone along the road to Australia achieving a really national and robust plantation industry. The organisers are to be congratulated on the concept and the conference itself, which was smoothly run, and especially for the subsequent production of a CD-ROM containing the full text of all papers, summary of discussions and notes from the field trips.

Conference proceedings

The conference commenced with two valuable background papers. The first was presented by Ian Bevege who gave a comprehensive review of the strategic issues associated with development of a new forestry industry in northern Australia. In particular he cautioned the necessity for the new industry to develop an effective niche marketing strategy, targeting both the domestic and international markets, and the need for growers to take into account social, political and environmental as well as technical and economic issues. Ian outlined the pitfalls into which a new industry in northern Australia could fall, and highlighted the difficulties of achieving economic success in what is essentially a hard and unforgiving climate.

Joanne Roberts then provided an interesting overview of investment opportunities, support mechanisms and challenges. Joanne pointed out that more than $9.5 billion has been invested in the forestry sector in Australia since 1994, including $3.4 billion in the development of new plantations. Since governments now generally restrict their role to that of providing policy settings and research, it was the private sector and Australian and international investors who will be expected to provide funding for new plantation projects, including any envisaged for northern Australia.

A series of papers then followed on suitable species for high value timber plantations in tropical Australia. The papers and subsequent discussion confirmed that there are many tree species, in particular those from the genera Santalum, Khaya, Tectona and Chukrasia, with very high value timber that have potential in the dry tropics of northern Australia. There are also a number of fascinating species and hybrids from Eucalyptus/ Corymbia that may have potential for plantation development in northern Australia.. The limiting factor in the dry tropics is water availability; suitable species must be drought-hardy, and in addition, some form of irrigation, or a good groundwater resource must be available to ensure commercial rates of growth.

The program then turned to silviculture, management, utilization and protection, and here many uncertainties emerged. In particular, speakers drew attention to the variability in rainfall for areas of the dry tropics, the infertility and fragility of most tropical soils, the lack of long-term silvicultural information and the need for effective pest and disease management. A positive note was the report of a conversion study on 34 year old Khaya from trial plots. This demonstrated that timber of high quality can be produced from plantations in this region.

The conference then applied itself to the question of

genetic improvement of tropical tree species suitable for northern Australia. Three papers were presented followed by a workshop session. The papers confirmed that tree improvement is still in an embryonic state for all of the species currently being considered for high value plantations, although it will be possible to capitalise on some of the work being done overseas, for example the work on teak which has been done in Malaysia. In the workshop session Garth Nikles put forward a proposal to set up a northern Australian cooperative tree breeding program, focussing on *Khaya senegalensis*. This is clearly the most efficient way to take this issue forward.

Conference outcomes

Three clear themes emerged from the conference:

1. African mahogany (*Khaya senegalensis*) is a species with enormous potential for commercial plantation development in northern Australia. Early trial results indicate that Khaya grows on a range of sites, is relatively drought-hardy, and is capable of producing high-grade timber from plantation-grown trees. For commercial production in the dry tropics, either irrigation or a good source of groundwater appears to be essential. While there are still gaps in knowledge about the silviculture and nutrition of the species and genetic improvement is still in its earliest phase, the conference helped to define the unknowns, and thus to indicate where future research and development is most needed. The proposal for a northern Australia tree breeding cooperative (initially focusing on Khaya) is especially positive. If it comes to fruition, I have no doubt it will come to be seen as a milestone in the history of plantation forestry in the dry tropics of Australia.
2. There are several other high value timber species with excellent potential, including teak and "Indian mahogany" (Chukrasia) and there already exist small commercial plantations of teak and of Indian sandalwood in the north, both of which have attracted investors, and which indicate the potential for the expansion of plantations producing high value timbers for international markets. Some new Eucalyptus/Corymbia hybrids are also demonstrating exceptional growth rates, form and drought-hardiness in northern areas, and although these are not regarded as capable of producing 'cabinet timbers' they do appear very promising for use in large scale non-irrigated plantations where the aim is to produce sawn timber rather than pulpwood.
3. There is a critical need for over-arching strategic leadership and coordinated industry planning to be directed at new hardwood plantation development in the dry tropics. The region falls within the governance of two State, one Territory and numerous Local governments and there are currently no formal cooperative arrangements in place, especially with respect to sharing technical and commercial information, research into genetic improvement, silviculture and timber processing and market opportunities. Informal networks between scientists, foresters and growers will only move the situation forward so far, and can become stymied by commercial competition and questions of intellectual property. At this early stage, governments have crucial roles to play, in particular in funding R&D and ensuring the policy settings are positive. It is not too early for a cooperative approach at formal industry development planning for the region as a whole, but for this to happen, someone must take the initiative.

The idea for the Mareeba conference arose in the first place from discussions about these very issues between foresters, landowners, tree growers, government researchers and commercial forestry organisations with a passion for northern Australia. The prospects appear to be enormous, but so also are some the issues that need to be tackled. At the moment, the key missing ingredients are leadership and a commitment of long-term R&D funding. It will be intriguing to observe whether this emerges, and if it does how the next phase unfolds.

The proceedings of this conference will be of interest to all foresters involved in the development and management of plantations of tropical hardwoods in the dry/monsoon tropics, and in the conservation of target species. The papers bring together disparate but up-to-date information, in particular on Khaya senegalensis and Santalum spp, not readily available elsewhere.

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