

INDONESIA



*For legend see page 58

Forest resources

Indonesia is a 5,200-km-long chain of some 17,000 islands straddling the equator in the heart of Southeast Asia. Its 220 million people live on a land area of about 188 million hectares. Indonesia is very diverse in geology and biology and the home of many cultures. It also has a considerable range of climates, from equatorial – with rainfall evenly distributed throughout the year – in Kalimantan, Sumatra and West Irian, to those with a pronounced dry season (such as in Java and the Moluccas). Soils range from the rich volcanic soils of Java and Madura to the leached lateritic soils of Kalimantan. Equally varied are population densities, land-uses and forest practices. In Java, for example, with 950 persons per km², home gardens and trees outside forests supply a significant portion of wood demand. In Kalimantan, on the other hand, the population is sparser, and large-scale commercial forestry in

natural forest is often the norm. Estimates of forest area range from 105 million hectares (FAO 2005a) to 120 million hectares^a; given the political, social, economic and environmental changes that have taken place in Indonesia in recent years it is likely that both these over-estimate the current extent of forest in the country.

Forest types. About 88% of forest cover is classified as tropical moist forest. For the purposes of management, six types are distinguished: mixed hill forests, sub-montane/montane and alpine forests, savanna/bamboo/deciduous/monsoon forests, peat swamp forests, fresh water swamp forests, and tidal forests (mangroves). Mixed hill forests account for about 65% of the natural forests and are the most important for timber production.

Dynamics of forest resource change. There has been a rapid loss of forest cover in the last 40 years; the average annual loss between 1990 and 2000 was an estimated 1.3 million hectares (1.2%) (FAO 2005a).

In the last 20 years, periodic serious fires have affected large areas of forest, especially in Kalimantan and parts of Sumatra. These have been partly influenced by the El Niño/Southern Oscillation phenomenon and aggravated by land clearance, the accumulation of combustible matter after logging, disputes over land tenure and the presence of burning coal seams in the surface strata.

Permanent forest estate. The forests of Indonesia have been classified by function as production, protection and conservation forests; forests earmarked for conversion are available for wood production until converted to other uses. About 44% of the forest area is reported to be production forest, 27% protection, 8% conversion and 21% conservation. According to official sources^a (see also Chrystanto & Justianto 2002), the area of PFE is

Table 1 PFE

Estimated total forest area, range (million hectares)	Total closed natural forest ('000 hectares) Source: FAO 2001	PFE ('000 hectares) ^d			
		Production		Protection	Total
		Natural	Planted		
105–120	100,382	46,000	2,500	22,500	71,000

112.2 million hectares, comprising 109.7 million hectares of natural forests (protection forest 33.5 million hectares, conservation forest 20.5 million hectares and production forest 55.7 million hectares) and 2.5 million hectares of plantations. However, these figures are probably based on old records and represent the area allocated to the PFE but not necessarily the extent of forest within that area. Table 1 shows an ITTO estimate of the current PFE. An estimated 81% of the external boundaries of the official PFE have been demarcated^a.

Planted forests. The area of planted forests in 2000 was estimated by FAO (2001) to be about 6.4 million hectares, but only 2.5 million hectares of these appear to be productive timber plantations^{a,b}. The total area is classified as: industrial forest plantations (*hutan tanamaan industri* – HTI), non-industrial (protective) forest plantations, social forestry, and enrichment planting. There are also plantations of agro-industrial crops that may become increasingly important in timber supply, including 3.48 million hectares of rubber (FAO 2001).

Institutional arrangements

Forest tenure. Article 5 of the 1999 Forest Law (see below) sets out two types of forest tenure: state and titled. A titled forest is a forest located on land on which the land title is registered. Traditional community rights (*adat*) to forest resources are also widely recognized based on the Customary Act of 1999. In the past, land settlement and the designation of forest were arbitrary, leaving unsettled a large number of claims by individuals and communities over traditional rights, ancestral domains and tenure.

SFM policy framework. Indonesia demonstrates its commitment to establishing SFM through its membership of many international organizations and its adherence to all relevant major international conventions. It has established its own C&I, developed national standards for forest certification and introduced the mandatory verification of SFM^a.

Forest policy and legislation. For many years, the legal and policy framework of Indonesia's forestry was provided by the Basic Forestry Law of 1967 (5/1967). This was replaced by Forestry Law 41/1999, which is now the primary source of authority and guidance on forest stewardship,

forest ownership and forest management. It also provides for forestry decentralization and community participation. Other relevant policy and legal instruments include: Law No 5/1990 on the conservation of natural living resources and their ecosystems, Law No 24/1992 on spatial planning and Law No 23/1997 on environmental management. The Forest Strategic Plan (*Renstra*) (2001–2005) aims to: (i) improve the quality and productivity of the forest resource; (ii) reduce the rate of forest resource degradation; (iii) implement SFM; and (iv) increase the contribution of the forest resource to the national economy and to community prosperity.

In 2001, Indonesia established a working group to develop a national forest program. It has engaged in wide consultations but has not yet adopted a common program for the management and conservation of its forests.

Institutions involved in forests. Forest management is generally undertaken by private companies, although six state enterprises currently operate about 12% of the country's concession area. Before decentralization, the Ministry of Forestry (MoF) in Jakarta was responsible for the management and control of forests and the conservation of natural resources. At the provincial level there were two different forestry offices: regional forestry offices (*kanwil kehutanan*) and provincial forestry offices (*dinas kehutanan propinsi*). The former, as an extension of the MoF, coordinated all technical aspects of forestry in the provinces. At the district level there were also two agencies dealing with forestry; one was responsible to the district government and the other was a sub-office of the provincial forest service. This dual control system came to an end in 1999 with the enactment of laws 22 and 25; MoF now has a much reduced role in the field, and authority over forest management is vested in the provinces and particularly the districts (*kabupaten*). Several national-level departments also have a forestry role, such as the departments of trade and industry, agriculture, transmigration and forest settlement, and mines and energy. An Inter-departmental Committee on Forestry was established in October 2000 to coordinate long-term policy and planning.

Decentralization in forestry covers forest production, the servicing of forestry businesses and the protection of forests dedicated to ecosystem and

biodiversity conservation. All forest land except national parks and nature reserves are to be managed by the *kabupaten* governments. Under Law No 22/1999, there is no hierarchical relationship between the central departments, the provincial forest services and the district forest services.

For many years, international NGOs have pressed for forest policy reform; this role has largely been assumed and greatly expanded by Indonesian NGOs. Networks link many hundreds of NGOs; prominent are WAHLI (Indonesian Forum of Environmental NGOs), KPSHK (Community Forest System Development Group), JKPP (Participatory Mapping Network), WWF Indonesia and the Association of Indonesian Forest Concessionaires, an industry body.

Status of forest management

Forest for production

All production forests within the PFE are covered by management plans^a. However, efforts to manage these forests sustainably are undermined by (among other things) the large discrepancy between the timber requirements of the existing wood industry and the estimated sustainable timber supply. At a policy level, the national AAC was reduced from 22 million m³ in the 1990s to 5.6 million m³ in 2004, but much timber still comes from illegal sources^{a,b}. Any reduction of timber production will further widen the divergence between timber supply and demand.

In order to open up the huge and valuable forest resource outside Java, Indonesia enacted legislation in 1967 to encourage the participation of private investors. The natural forests began to be harvested on a large scale in 1969 once the government began issuing forest concessions. Under the concession system, the management and extraction of public forest resources can be undertaken by state companies, companies owned by regional administrations, national private companies, cooperatives or foreign private companies with Indonesian legal status. The concession system is also used for raising and managing forest plantations (HTIs) and for other forestry enterprises. There are two categories of concessions for logging in natural forests: forest concession rights (*hak pengusaha hutan* – HPH), and forest products collection rights (*hak pemungutan hasil hutan* – HPHH); the latter ceased to be

issued after July 1989. HPH rights are for large concessions and run for periods of up to 20 years, recently increased to 55 years for natural forests and 100 years for plantations under Governmental Regulation No 34 (2002). After decentralization, HPHHs were revived in the form of log exploitation permits (*izin pemanfaatan kayu* – IPK). By the early 1990s, the number of HPHs had reached 584, with a total area of about 68 million hectares. The recorded production of industrial wood increased from 5 million m³ in 1965 to about 47 million m³ in 1990, a trend which led to the development of forest industries based on ‘supply-push’^b. In 2001, there were 354 HPHs and 102 HTIs covering 39.3 million hectares^a.

In general, Indonesian forest management needs urgent strengthening. Many of the concessions do not have clearly demarcated boundaries, and forest fires, illegal land clearance and shifting cultivation are widespread. Illegal logging is now recognized as one of the most critical problems of forestry and the forest industry in Indonesia^a; according to some reports, the volume of illegal logging exceeds legal production^b.

Under the concession system, the value of timber harvested by the concessionaires is realized by the government as stumpage/royalty and other charges or levies. For the whole of Indonesia the rent capture (often a reflection of efficiency) in logging concessions during 1997–98 was 24–36% (average 30%), leaving 64%–76% to the concessionaires^b. Because log exports have been prohibited since 1985 and rough-sawn timber exports since 1992, the main avenue for timber companies to capture rent is through the export of plywood. The same top five companies that dominate in concession holdings have obtained a similar market share in the plywood factories.

Decentralization has tended to add to the confusion surrounding Indonesian forest management. For example, many local governments do not fully recognize nationally designated land-uses such as concession areas. Instances have been reported in which small-scale operators have been granted forest concessions that overlap concessions designated by the national government; moreover, the capacity of local government to administer forest policies is often limited (Rukmantara 2003).

Table 2 Some commonly harvested species for industrial roundwood (2001–03)^{b,d}

Timber species	Remarks
<i>Shorea</i> spp (meranti)	Dipterocarpaceae, used for sawn timber and plywood
<i>Dipterocarpus</i> spp (keruing)	Dipterocarpaceae, used for sawn timber and plywood
<i>Dryobalanops</i> spp (kapur)	Dipterocarpaceae, used for sawn timber and plywood
<i>Anisoptera</i> spp (mersawa)	Dipterocarpaceae, used for sawn timber and plywood
<i>Tectona grandis</i> (teak)	From planted forests

Silviculture and species selection. Indonesia's forests contain about 4,000 tree species, 267 of which are traded^a. The most important are trees of the Dipterocarpaceae family. Table 2 shows five of the most important harvested species; others include species of *Koompassia*, *Palaquium*, *Dyera*, *Calophyllum inophyllum* and *Octomeles sumatrana*. *Gonystylus bancanus* (ramin), a highly priced wood which was extensively logged in the past, is now listed in CITES Appendix II. The silvicultural system originally prescribed for logging in concession areas was 'Indonesian selective cutting' (*Tebang Pilih Indonesia* – TPI). Only mature and overmature trees conforming to prescribed conditions were to be removed. It was later realized that the concessionaires were only complying with the minimum felling diameter limit and ignoring the other requirements of the system (eg residual stand inventory, post-harvest tending and enrichment planting)^b. In 1989, MoF introduced the Indonesian Selective Cutting and Planting System (*Tebang Pilih Tanam Indonesia* – TPTI), which placed greater importance on natural regeneration and enrichment planting. A further modification, the Selective Cutting and Strip Planting System (*Tebang Pilih Tanam Jalur* – TPTJ), was introduced in the 1990s. It is thought that the TPTJ should be able to deliver both increased wood production and enhanced environmental conservation if properly implemented.

Planted forest and trees outside the forest. Important planted species are teak (1.47 million hectares), *Pinus merkusii* and other pines (0.77 million hectares), *Acacia* spp (0.64 million hectares), *Eucalyptus* spp (0.13 million hectares), and other broadleaved species (3.39 million hectares) including *Gmelina arborea*, *Albizia* and *Melaleuca*. Many species are also planted in homesteads and farms.

There is an apparent discrepancy in information on the extent of concessions allocated in plantations. According to one source there were 176 approved HTI concessions in 2000 with a land allocation of 7.76 million hectares^b, while another reported that the 102 HTIs in 2001 covered an area of 2.50 million hectares^a. The overall performance of HTIs has not been satisfactory, although of a higher standard in the case of pulpwood^b. A recent evaluation of 65 HTIs recommended the continuation of only 30 (MoF 2003).

Forest certification. A system of timber certification has been developed through the Indonesian Ecolabelling Institute (*Lembaga Ekolabel Indonesia* – LEI). Established in 1993, LEI has devised C&I for the auditing of forest management in logging concessions and the ecolabelling of products from these concessions. LEI has also recently developed chain-of-custody certification and a log audit system in an effort to stamp out illegal logging and related irregularities. This system is to be implemented through accredited certification bodies. LEI has also developed C&I for planted forests, community-based forest management (CBFM) and 'legal origin verification'. In addition, LEI has developed a joint certification program (JCP) with the FSC. As of October 2005, an area of 274,598 hectares of mostly natural forest had been certified under JCP and the FSC (FSC 2005). Under the certification scheme for CBFM, two forests were certified as of October 2005 and three others were under assessment, although the area of forest covered by these was unreported^a. One forest-based business (PT Uniseraya) had gained a chain-of-custody certificate under the LEI scheme and 29 under the FSC^a. Certificates of legal origin verification, which use a log-tracking system to verify the source of timber, had been awarded to two companies in Riau^a.

Table 3 Management of the production PFE ('000 hectares)

Total	Natural				Planted		
	Allocated to concessions/ under licence	With management plans	Certified	Sustainably managed	Total	With management plans	Certified
46,000	43,200*	18,400	275	2,940	2,500	2,500	0.152

* 94% of production forests are allocated to concessions, although a considerable number of concessions were under suspension at the end of 2004

Estimate of the area of forest sustainably managed for production. MoF is undertaking a review of concessions and their compliance with the Indonesian C&I. During 2002–2004, 38 HPHs covering 4.20 million hectares were assessed and 25 of these covering 2.94 million hectares evaluated to have good to very good compliance; a further 53 HPHs were being assessed in 2005, but results were not available for this report (MoF 2005). To avoid possible double-counting, all the certified forest concessions are assumed here to be included in the figure of 2.94 million hectares and are therefore not added to the estimate of sustainably managed forest given in Table 3. The 98,000-hectare PT Hutaniendo concession in Central Kalimantan, which is working with the Tropical Forest Trust (with ITTO support) to achieve a 'sustainable standard of forestry' and the 1.52-million-hectare Malinau (Bulungun) forest are considered to be well managed; however, these are also excluded from the estimate of sustainably managed forest in Table 3 because of the possibility of double-counting. If the assessment that 70% of concessions surveyed showed good to very good compliance to the Indonesian C&I was extrapolated to the entire production PFE, about 32 million hectares would be thus assessed.

Timber production and trade. Total wood production in 2003 was estimated to be about 120 million m³, consisting of 34 million m³ of industrial wood and 86 million m³ of fuelwood (FAO 2005b). ITTO (2004, 2006 in prep.) gives the total industrial log production in 2003 as 25.0 million m³, down from 33.2 million m³ in 1999; however, the volume of illegal logging may exceed the official cut^b. The annual area allocated for timber production is 367,450 hectares, comprising 252,780 hectares (69%) of natural forest and 114,670 hectares (31%) of plantations, contributing 85% and 15% respectively to log production^a.

In 2000, the wood-based industry contained 4,400 sawmills (installed capacity 19 million m³), 120 plywood mills (installed capacity 11.1 million m³), 39 particleboard mills, 102 blockboard mills, 13 chipmills, two MDF units, 81 pulp and paper mills (installed capacity 5.23 million tonnes of pulp and 9.12 million tonnes of paper), and a large number of secondary processing units^b. The output of wood-based primary processing industries in 2003 was: wood residues – 388,000 m³; sawnwood – 6.25 million m³; wood-based panel products – 7.33 million m³; wood pulp – 5.48 million tonnes; and paper and paperboard – 6.99 million tonnes (FAO 2005b). Indonesia is a net exporter of forest products. In 2003, the recorded export value of primary wood products (logs, sawnwood, veneer and plywood) alone was about US\$1.8 billion, down from US\$2.9 billion in 1999 (ITTO 2002, 2005). Exports are mainly directed towards Japan, Taiwan Province of China, China and South Korea; Japan is the main importer of Indonesian plywood. The wood-industry sector in Indonesia is undergoing restructuring. It suffers from over-capacity, a wood-supply deficit, unsustainable forest harvesting, a low level of capacity utilization, low efficiency and low competitiveness, among other problems^b.

Non-wood forest products. A wide range of NWFPs are produced in Indonesia – rattan, bamboo, *Nipa* fronds, *Metroxylon* spp (sago starch), resin from *Pinus merkusii*, *Shorea javanica* (damar mata kucing), copal, *Melaleuca* (kaya putih oil), *Santalum album* (cendana), *Aquilaria malaccensis* (agarwood), medicinal plants, fibres and fruits such as *Durio zibethinus* (durian). Wood-carving for souvenirs is important, using woods such as *Hibiscus tiliacculus*, *Manilkara kauki* (sawo kecil), *Artocarpus heterophyllus* (jackfruit), teak, sandalwood and ebony. One important forest service among many is carbon storage: the total carbon stored in the forests of Indonesia is estimated to be 92.5 billion tonnes^a.

Table 4 Management of the protection PFE ('000 hectares)

Total	Attributed to IUCN categories I-IV	Allocated for soil and water	With management plans	Sustainably managed
22,500	14,400	16,000	5,000 ^a	1,360 ^d

Forest for protection

Soil and water. Indonesia pursues integrated watershed management; some 28% of the total forest area is managed primarily for the protection of soil and water^a. Forest concession agreements have conditions covering the establishment of buffer strips along streams and protective belts along roads.

Biological diversity. With about 1.3% of the earth's land surface, Indonesia contains an estimated 10% of the world's plant species, 12% of mammals, 16% of reptiles and amphibians, and 17% of birds. Some 58,175 species have been identified^a. One hundred and forty-six mammals, 122 birds, 28 reptiles, 33 amphibians and 387 plants are listed as critically endangered, endangered or vulnerable on the IUCN red list of threatened species; of these, 61 mammals, 113 birds, 31 amphibians and 16 plants are found in forests (IUCN 2004). Thirty plants are listed in CITES Appendix I and 1,023 in Appendix II (CITES 2005).

Protective measures in production forests.

In addition to stipulations for conservation measures contained in forest concession agreements, elaborate guidelines are set out in various forest regulations such as the forest law and Decree No 32 (1990) concerning the management of protected areas. Regulations include specifications for road construction, protective belts along the margins of streams/rivers and roads, the alignment of skid trails, directional felling, and enrichment and protective planting.

Extent of protected areas. Some 400 protected areas covering about 22.5 million hectares of forest (12.4% of land area) have been designated and gazetted as nature reserves, national parks, wildlife sanctuaries, forest parks, etc. Many of the protected areas are thought to be degraded, due largely to illegal activities^b. According to UNEP-WCMC (2004), 14.4 million hectares of forest are in protected areas that conform to IUCN protected-area categories I-IV, including 4.05 million hectares of lowland

evergreen broadleaved rainforest, 2.84 million hectares of upper montane forest, 2.13 million hectares of freshwater swamp forest, and a sizeable 3.03 million hectares of unclassified forest.

Estimate of the area of forest sustainably managed for protection.

The management of the area of the protection PFE (Table 4) is, for the most part, problematic. Management plans have been prepared for the Betung Kerihun and Kayan Mentarang national parks on Borneo, which together cover about 2.18 million hectares of forest, and their management is being greatly strengthened under two ITTO projects implemented by WWF Indonesia and MOF's Directorate General of Forest Protection and Nature Conservation; a recent evaluation of the Kayan Mentarang project reported considerable progress and a positive outlook for the park. Management plans have also been prepared for some other national parks and efforts made to implement them (WWF Indonesia, pers. comm.). However, in general there is little information on the management status of the protection PFE. Therefore, the estimate given in Table 4, which comprises the Kayan Mentarang National Park only, is probably conservative^d.

Socioeconomic aspects

Economic aspects. Forests and forest industries make a substantial contribution to Indonesia's socioeconomic development. About 0.61% of the labour force (nearly 500,000 people) is directly employed in the forestry sector^a. In 2000, forestry contributed 1.17% of GDP (about US\$15 billion)^a, although this figure may not include the downstream-processing sector.

Livelihood values. An estimated 36 million people make use of forests and forestry for their livelihoods, some 4 million of whom are tribal families who depend entirely on natural forests for their income^a. Rural poverty is an important cause of illegal logging and unsustainable use.

Social relations. In many cases forest concessionaires have neglected or rejected the traditional rights of local communities; in some areas this has prompted such communities to collaborate with illegal loggers and/or to take revenge by damaging the forest^b. Some concessionaires are working towards repairing relations with local communities in an effort to improve acceptance of their activities^b. Decentralization has often complicated disputes over land and usufruct rights but in the long run could provide mechanisms for resolving them.

Summary

Indonesia's forest resource base is still vast, but it faces many threats that put its long-term sustainability in jeopardy. These include illegal logging; forest fires; deforestation through land encroachment; wasteful logging and processing; structural deficiencies and inefficiencies in forest industries; the indebtedness of forestry enterprises; unsettled land claims; inefficiencies in public forest administration, in particular in the process of decentralization; an inadequate base of human resources; inadequate monitoring and evaluation; and a lack of effective governance. On the other hand, significant progress has been made in the establishment of certification systems and information on the management of concessions is becoming increasingly available.

Key points

- The estimated 68.5 million hectares of Indonesia's natural-forest PFE comprises 46.0 million hectares of production forest and 22.5 million hectares of protection forest. There are also about 2.50 million hectares of productive timber plantations.
- The security and integrity of the PFE are affected by several factors, of which forest fire and encroachment are among the most important.
- Illegal logging in the PFE (both production and protection) is widely held to be a major problem.
- The Ministry of Forestry is undertaking a review of concessions and their compliance with the Indonesian C&I. This process has shed light on the status of management in the production PFE.

- It is estimated that at least 2.94 million hectares of natural-forest production PFE and 1.36 million hectares of protection PFE are being managed sustainably.
- Some 12% of the land area of Indonesia has been designated as protected areas. However, information on the management of a large part of the protection PFE is scarce.
- Forestry is undergoing a process of decentralization that has proven difficult partly because of a lack of capacity at the decentralized levels of administration and partly because of disharmony in the policies of central and local governments.
- C&I for SFM have been developed for the country and a certification regime designed. About 275,000 hectares have so far been certified.
- The prescriptions for the management of production forests are conceptually sound but implementation has been weak. Over-capacity and structural imbalances in the wood-processing sector have exacerbated the situation.

References and other sources

- ^a MoF 2002. Country Report on the Progress and Achievements towards Sustainable Forest Management in Indonesia. Submitted to ITTO, March 2002. Departemen Kehutanan, Ministry of Forestry, Jakarta, Indonesia. Unpublished.
- ^b ITTO 2001. Achieving Sustainable Forest Management in Indonesia. Report of the Diagnostic Mission. Presented at the thirty-first session of the International Tropical Timber Council, November 2001. ITTO, Yokohama, Japan.
- ^d ITTO estimate
- Chrystanto, S. & Justianto, A. 2001. Review of National Forest Policy in Indonesia. Country report presented at the 19th session of the Asia-Pacific Forestry Commission, Ulaanbaatar, Mongolia, 28–30 August 2002.
- CITES 2005. CITES-listed Species Database. Available from: <http://www.cites.org/eng/resources/species.html> (accessed September 2005).
- FAO 2001. *Global Forest Resources Assessment 2000*. FAO Forestry Paper 140. FAO, Rome, Italy.

- FAO 2005a. *State of the World's Forests 2005*. FAO, Rome, Italy.
- FAO 2005b. *Yearbook of Forest Products 2001*. FAO, Rome, Italy.
- FSC 2005. FSC – Certificates Worldwide. FSC International Center & Working Group, Germany. Available from: <http://www.fsc-info.org> (accessed October 2005).
- ITTO 2002. *Annual Review and Assessment of the World Timber Situation 2001*. ITTO, Yokohama, Japan.
- ITTO 2004. *Annual Review and Assessment of the World Timber Situation 2003*. ITTO, Yokohama, Japan.
- ITTO 2005. *Annual Review and Assessment of the World Timber Situation 2004*. ITTO, Yokohama, Japan.
- ITTO 2006 in prep. *Annual Review and Assessment of the World Timber Situation 2005* (draft). ITTO, Yokohama, Japan.
- IUCN 2004. 2004 IUCN Red List of Threatened Species. Available from: <http://www.redlist.org> (accessed September 2005).
- Lopez, C. & Shanley, P. 2004. *Riches of the Forest: Food, Spices, Crafts and Resins of Asia*. CIFOR, Bogor, Indonesia.
- MoF 2003. Report to stakeholders: current condition of forestry development. Statement on progress towards implementing sustainable forest management at the twelfth CGI meeting. Denpasar, January 2003. Available from: http://www.dephut.go.id/INFORMAS/CGI/CGI_03/report_12th.htm (accessed September 2005).
- MoF 2005. *Progress towards Sustainable Forest Management in Indonesia: Significant Achievements*. Information leaflet distributed by the Indonesian Ministry of Forestry at the 39th Session of the ITTC, November 2005.
- Rukmantara 2003. Repairing the road to SFM. *ITTO Tropical Forest Update* 13/4.
- Smith, J., Obidzinski, K., Subarudi & Suramenggala, I. 2003. Illegal logging, collusive corruption and fragmented governments in Kalimantan, Indonesia. *International Forestry Review* 5(3), 293–302.
- UNEP-WCMC 2004. Spatial analysis of forests within protected areas in ITTO countries. UNEP-WCMC, Cambridge, UK. Data prepared for ITTO, 2004 (see Annex 1).