

NOTES

1. Until 1998, the Ministry was called the Ministry of Forestry. From 1998 to 2000, it was known as the Ministry of Forestry and Estate Crops (MOFEC). In August 2000, a new Cabinet was formed and MOFEC was merged with the Ministry of Agriculture and renamed the Ministry of Agriculture and Forestry. This lasted just 3 months, when the name reverted to the Ministry of Forestry. For the sake of simplicity, this report uses “Ministry of Forestry” throughout.
2. Biomass quantities reported by the FAO refer to above-ground live and dead vegetation. They do not include below-ground biomass, such as root structures, or organic carbon present in soils. The carbon storage estimate presented here is based on the assumption that approximately half the weight of wet biomass is water and approximately half the weight of (dry) biomass is carbon.
3. Some of the common flaws and potential pitfalls of ecological valuation studies are usefully summarized in Doug Sheil and Sven Wunder. “The value of tropical forest to local communities: complications, caveats and cautions.” Forthcoming in *Ecological Economics*.
4. The figure of 6.6 million ha corresponds to the areas identified in the GOI/World Bank dataset as forest but classified by the National Forest Inventory, 1996 as industrial timber plantations or estate crop plantations.
5. The six IUCN protected area categories are: Ia Strict Nature Reserve: Protected Area managed mainly for science; Ib Wilderness Area: Protected Area managed mainly for wilderness protection; II National Park: Protected Area managed mainly for ecosystem conservation and recreation; III Natural Monument: Protected Area managed for conservation of specific natural features; IV Habitat/Species Management Area: Protected Area managed mainly for conservation through management intervention; V Protected Landscape/Seascape: Protected Area managed mainly for landscape/seascape conservation and recreation; VI Managed Resource Protected Areas: Protected Area managed mainly for the sustainable use of natural ecosystems.
6. “Illegal loggers steal Indonesia’s market share in China.” *Asia Pulse/Antara*. June 22, 2001.
7. “Watchdog eyes forestry scams.” *Indonesian Observer*, January 5, 2000.
8. “Indonesia stops issuing fresh forestry concession licenses.” *Asia Pulse/Antara*, April 18, 2000.
9. Information made available to Forest Watch Indonesia by the Ministry of Forestry.
10. “Indonesia stops issuing fresh forestry concession licenses.” *Asia Pulse/Antara*, April 18, 2000.
11. Investigation Report. Leuser Lestari Foundation. 1998-1999.
12. “Environmentalists challenge “eco-timber” go-ahead for logging in endangered tiger habitat. Important test case for Forest Stewardship Council; consumers could be misled by ‘green’ scheme.” Rain Forest Foundation and Walhi. Press Release, July 11, 2001.
13. “Analysis and Discussion Paper by the Director General for Protection and Conservation of Nature,” National Working Meeting of the Ministry of Forestry and Estate Crops, June 26-29, 2000, 13-14. (Translation from original by C.V. Barber.)
14. “Timber fencing and smuggling still rampant.” *Jakarta Post*, July 3, 1996; “Legislators urge government to stop timber brokers.” *Jakarta Post*, July 3, 1996.
15. “Security personnel aid timber thieves.” *Jakarta Post*, May 15, 2000.
16. “Military, judiciary urged not to support illegal logging.” *Indonesian Observer*, June 20, 2000.
17. “Illegal loggers steal Indonesia’s market share in China.” *Asia Pulse/Antara*, June 22, 2000.
18. Plywood production data from the FAO, ITTO, and GOI are broadly comparable until 1996 (reporting 1996 production of 9.5, 9.1, and 9.1 million tons, respectively). From that year, the FAO shows a slight increase in 1997, then a precipitous decline from 9.6 million to 4.4 million tons in 1999. ITTO has a small overall decline to 8.5 million tons in 1999. The Indonesian Ministry of Forestry reports a sharp increase to 10.9 million tons in 1997, followed by a fall to 7.2 million tons in 1999. These data are all the more mysterious given that both FAO and ITTO base their reports on official Indonesian statistics.
19. “Indonesia faces forest dilemma: donors seek curbs on logging but powerful interests are involved.” *International Herald Tribune*, February 1, 2000.
20. “Indonesia – wood cuts: illegal logging could stem the flow of aid to Indonesia.” *Far Eastern Economic Review*, January 27, 2000.
21. Government Regulation No. 7 of 1990 Regarding Industrial Timber Plantations.
22. The 1991 Indonesian Forestry Action Programme stated that “the role of plantation forests in supple-

- menting natural forest resources will also be very important to conservation objectives in the country.” (Government of Indonesia, 1991. *Indonesia Forestry Action Programme*. Vol. 2, p. 60. Jakarta, Indonesia.)
23. Private firms developing HTIs are eligible for capital participation by the government in the amount of 14 percent and zero-interest loans of up to 32.5 percent, both drawn from the Reforestation Fund. State corporations are eligible for 35 percent government capital participation and can access interest-free loans of up to 32.5 percent.
 24. “World Bank Involvement in Sector Adjustment for Forests in Indonesia: The Issues.” Jakarta, Indonesia, 1998. Memorandum.
 25. Both APP and APRIL were listed on the New York Stock Exchange in 1995, but the exchange announced plans to delist them in July (APP) and September (APRIL) 2001 because the groups had traded at below \$1 per share for more than 30 days, breaking an exchange rule. “New York Stock Exchange intends to delist Asia Pacific resources.” *The Wall Street Journal*, September 3, 2001.
 26. “Indonesia APRIL units \$1.3B debt deal draws creditor ire.” *Dow Jones Newswires*, November 8, 2000; “Indonesia’s APRIL cannot meet all interest payments.” *Asian Wall Street Journal*, June 7, 2001.
 27. Note that *Oil World’s* estimate of 7 million tons is higher than the figure of 6.2 million tons provided by the Indonesian Ministry of Forestry.
 28. Local farmers in Lore Lindu National Park, Central Sulawesi, told one of this report’s authors that extensive forest clearance around their village was caused entirely by transmigrants from Southeastern Sulawesi. It transpired that the newcomers numbered less than one dozen families and that many of the locals had recently cleared land for new cocoa trees.
 29. Production data on cocoa: online at <http://www.oardc.ohio-state.edu/cocoa/regions.htm>; coffee: online at <http://www.ico.org/statist/po2.htm>; rubber: online at http://www.sbindo.co.id/products/Agriculture/Natural_Rubber.htm; palm oil: *Oil World Annual*, 2001.
 30. A somewhat more recent estimate (Casson, 2000) puts the total area under rubber (including large-scale plantations) at 6.1 million ha in 1998. This is hard to reconcile with the Ministry of Forestry estimate of 3.5 million ha in 1997.
 31. “Indonesian farmers have abandoned coffee plantations in Sumatra because of low international prices.” *Commodity News*. July 23, 2001.
 32. El Niño is a periodic climatic phenomenon caused by interaction between the atmosphere and abnormally warm surface water in the eastern Pacific Ocean off the coast of South America. Occurring about every 2-7 years, El Niño events usually last about one year and often bring extended periods of drought to Indonesia and other parts of the western Pacific.
 33. See Barber and Schweithelm, 2000 for a detailed account of the 1982-1983 East Kalimantan fire and citations to the numerous field studies that were carried out in the aftermath of the fire.
 34. This account of the 1997-1998 fires is adapted from Barber and Schweithelm 2000, with permission of the authors.
 35. Rural impacts of the 1997 currency devaluation have varied a great deal among areas, however. Where export commodities constituted a significant proportion of the local economy, farmers received a windfall from the devaluation. But, where they did not, the rising prices had severe negative economic impacts. See: J. Poppele, S. Sumarto, and L. Pritchett, 1999. “Social Impacts of the Crisis: New Data and Policy Implications.” Jakarta, Indonesia: Paper prepared for the World Bank. Draft.
 36. “Jakarta promises a haze-free year.” *Straits Times*, April 5, 2000.
 37. “Indonesia fires spread, smog reaches Thailand.” Reuters, July 19, 2000.
 38. “Thick smog shuts Indonesia’s Medan Airport.” Reuters, July 20, 2000.
 39. “Jakarta has no plan to combat forest fires.” *Straits Times*, July 18, 2000.
 40. “Where in the world are the firefighters? Hundreds of fires are burning across Riau province, but no one is fighting them nor are police arresting suspects.” *Straits Times*, July 28, 2000.
 41. “Sony ‘powerless’ to cope with forest fires.” *Jakarta Post*, July 31, 2000. In the same interview, the Minister (Sony Keraf) recounted how he had confronted the Governor of West Kalimantan with clear satellite data implicating two companies in the ongoing fires in that province. Despite the evidence, the Governor bluntly denied the charge.
 42. “Who’s playing with fire again?” *Tempo*, July 17-23, 2001.
 43. “Peat fires blamed as smoke haze thickens in Indonesia.” Agence France-Presse, July 12, 2001.

44. "Still no plan by Jakarta to fight fires feeding haze." *Straits Times*, July 12, 2001.
45. For analysis of the economic crisis of 1997-1998 and its lingering aftereffects, see World Bank. *Indonesia in Crisis: A Macroeconomic Update*. Washington DC: World Bank, 1998; H.W. Arndt and H. Hill. *Southeast Asia's Economic Crisis: Origins, Lessons, and the Way Forward*. Singapore: Institute of Southeast Asian Studies, 1999; A.L. Smith. *Gus Dur and the Indonesian Economy*. Singapore: Institute of Southeast Asian Studies, 2001; E. Salim, "Indonesia's Future Economic Challenges." *Jakarta Post*, April 9-10, 2001 (in two parts).
46. For accounts of the politics and economics of the Suharto era, see A. Schwarz, *A Nation in Waiting: Indonesia in the 1990s*. St. Leonards, Australia: Allen and Unwin, 1994; H. Hill, ed., *Indonesia's New Order: The Dynamics of Socio-Economic Transformation*. St. Leonard's, Australia: Allen and Unwin, 1994.
47. For accounts and analysis of the fall of Suharto see G. Forrester & R.J. May, eds., *The Fall of Soeharto*. Singapore: Select Books, Ltd., 1999. Many analyses of the East Asian economic crisis and its impacts on Indonesia have been published since 1998. See, for example H.W. Arndt and H. Hill, eds., *Southeast Asia's Economic Crisis: Origins, Lessons, and the Way Forward*. Singapore: Institute of Southeast Asian Studies, 1999.
48. On Habibie's presidency, see D.F. Anwar, "The Habibie Presidency" and other articles in G. Forrester, ed., *Post-Soeharto Indonesia: Renewal or Chaos?* Singapore: Institute of Southeast Asian Studies.
49. On the complex process and politics by which Wahid became president in October 1999, see "Dark before dawn: how elite made a deal before Indonesia woke up." *The Wall Street Journal*, November 2, 1999.
50. For an analysis of Wahid's first years in office and his tenuous hold on power as of early 2001, see International Crisis Group, "Indonesia's Presidential Crisis." Briefing Paper, February 21, 2001. Online at www.intl_crisis_group.org.
51. On East Timor's violent independence referendum, see United Nations Office of the High Commissioner for Human Rights, *Report of the International Commission of Inquiry on East Timor to the Secretary-General*. Geneva. January, 2000.
52. On Aceh's separatist struggle, see G. van Klinken, "Whither Aceh? An update on events in 1999." *Inside Indonesia* No. 62, April-June, 2000. Online at <http://www.insideindonesia.org> and "Indonesia's Aceh conflict smoulders on." *Asian Wall Street Journal*, April 26, 2000. On separatism in Irian Jaya, see "Irian Jaya wants to shake off Indonesian rule." Agence France-Presse, December 1, 1999; J. Rumbiak, "Statement of Irian Jaya at the 56th Commission on Human Rights." United Nations Commission on Human Rights, 56th Session, Agenda Item 11: Civil and Political Rights. Geneva, April 6, 2000.
53. "Rich regions reject Jakarta hand." *Jakarta Post*, November 22, 1999.
54. "Workshop questions Indonesia's autonomy laws... and expert urges 'some form of federalism.'" *Jakarta Post*, July 18, 2000; "Logical flaws in regional autonomy." *Jakarta Post*, May 2, 2000.
55. International Crisis Group, *Indonesia: Overcoming Murder and Chaos in Maluku*, December 19, 2000. Online at www.intl_crisis_group.org; "Bloodbath grips Indonesia." *Far Eastern Economic Review*, July 6, 2000 (cover story).
56. "Savage attacks terrorize migrants on Borneo." *Washington Post*, February 24, 2001; "211 confirmed dead in Poso [Central Sulawesi] clashes." *Jakarta Post*, July 7, 2000; "Communal violence hits Kumai in Central Kalimantan." *Jakarta Post*, July 7, 2000; "West Kalimantan: Tension between ethnic groups obscures future." *Jakarta Post*, February 15, 2000; "Communal violence leaves over 765,000 refugees across Indonesia." Agence France-Presse, June 20, 2000.
57. "1.25 million people displaced by violence, armed conflicts." *Jakarta Post*, July 12, 2001. For an earlier report on internal refugees, see "Communal violence leaves over 765,000 refugees across Indonesia." Agence France-Presse, June 20, 2000.
58. "The new face of Indonesian justice: the legacy of police violence in the Suharto era lives on in an upsurge of brutal vigilante attacks." *Far Eastern Economic Review*, July 13, 2000 (cover story).
59. On the Indonesian military since the fall of Suharto, see: "Skeletons, vigilantes and the Armed Forces' fall from grace." In *Reformasi: Crisis and Change in Indonesia*. A. Budiman, B. Hatley, and D. Kingsbury, eds. Clayton, Australia: Monash Asia Institute, 1999.
60. J. Saunders, "Indonesian forces are part of the problem in the Moluccas." *International Herald Tribune*, July 4, 2000.

61. In July 2000, the Minister of Defense admitted that the government's police and military were unable to maintain security in the country and that it would take "between 10 and 15 years" to build a well-functioning police force. "Indonesian government cannot guarantee internal security: minister." Agence France-Presse, July 12, 2000.
62. "Plywood investors back off," *Jakarta Post*, March 18, 2000. Results of the APHI survey of concession-related conflicts, including names of companies and the specific demands of local communities, were published in "Darurat: Konflik Sosial" ["Emergency: Social Conflict"], *Hutan Indonesia* [Indonesian Forests, APHI's newsletter] No. 7, March 2000.
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64. For a detailed assessment of the situation in 20 of Indonesia's protected areas, see M. Wells et al., *Investing in Biodiversity: A Review of Indonesia's Integrated Conservation and Development Projects*. Washington DC: World Bank, 1999.
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71. "Policy Dialogue for Creation of a Conducive Environment for Sustainable Management of All Types of Forests in Indonesia." Position paper presented on behalf of the Donors by the European Commission, 11th Consultative Group Meeting on Indonesia, Jakarta, Indonesia. April 23-24, 2001.
72. "Call for a Moratorium on Industrial Logging: Supporting Implementation of the Government of Indonesia's Commitments to Forestry Sector Reform." Prepared for the 11th CGI Meeting, Jakarta, April 23-24, 2001. WALHI-The Indonesian Forum for Environment. Online at <http://www.walhi.or.id/KAMPANYE/Moratorium.htm>

GLOSSARY

Accessed Forest: A term used in this report to describe forest that has been disturbed by human activity. Accessed forests are defined not according to a measure of biological disturbance but by the proximity of the forest to roads, navigable rivers (in the case of Kalimantan), human settlements, agriculture, mines, and other developments. Forests are considered accessed if they are within 0.5 km of rivers or 1 km of roads and other features. (See also Low Access Forest.)

Afforestation: The establishment by human action of forest cover on land that was not previously forested or was not forested within living memory.

BAPPENAS (*Badan Perencanaan Pembangunan Nasional*): National Development Planning Agency

BPS (*Badan Pusat Statistik*): Central Statistics Board

CIFOR: Center for International Forestry Research

Clear-cutting: The complete removal of all tree cover for wood harvesting and/or land clearance.

Concession: An area of natural forest designated for selective harvest under an HPH license. (See also Production Forest.)

Conservation Forest: Forest that is designated for wildlife or habitat protection, usually found within national parks and other protected areas.

Conversion Forest: Forest that is designated (under an IPK license) for clearance and permanent conversion to another form of land use, typically a timber or estate crop plantation.

Deforestation: The permanent removal of forest cover and conversion of the land to other uses. According to the *land use* definition used by FAO and accepted by most governments, forest land that has been harvested, even clear-cut, is not regarded as deforested because, in principle, trees may regrow or be replanted. Deforestation is recorded only when the land is permanently converted to nonforest use. However, the remote sensing imagery used in this report to determine *land cover* (the presence or absence of forest) over time does not make such a distinction and clear-cut land has been recorded as nonforest or deforested land.

DFID: Department for International Development, United Kingdom

EPIQ/NRM: Environmental Policy and Institutional Strengthening Indefinite Quantity Contract/Natural Resources Management Program. A program of the United States Agency for International Development (USAID).

Estate Crops: Agricultural crops grown on plantations. The most widely grown estate crops include rubber, oil palm, coconut, cocoa, and tea.

FAO: Food and Agriculture Organization of the United Nations

Forest Degradation: May be generally defined as a reduction in tree density and/or increased disturbance to the forest that results in the loss of forest products and forest-derived ecological services. The FAO defines degradation as changes within the forest class (for example, from closed to open forest) that negatively affect the stand or site and, in particular, lower production capacity. Common

causes of forest degradation include selective felling, fuelwood collection, road building, and shifting cultivation.

Forest/Forest Cover: Land on which trees form the dominant vegetation type. The FAO defines forest as land with tree crown cover of more than 10 percent of the ground and land area of more than 0.5 ha. In addition, the trees should characteristically reach a minimum height of 5 m at maturity. It should be noted that a canopy cover threshold of 10 percent represents quite sparse tree cover; most natural forest in Indonesia is closed canopy forest. The Indonesian government uses a land use definition of forest in the various land use classes that comprise “Permanent Forest Status” (*see below*). However, up to 20 percent of Permanent Forest Status land has been deforested.

HPH (*Hak Pengusahaan Hutan*): A license that is granted for the selective harvest of natural forests over a given period, typically 20 years, and is renewable for a further period, typically another 20 years. The licenses are intended to maintain the forest as permanent production forest.

HTI (*Hutan Tanaman Industri*): A license to grow an industrial forest to supply industrial fiber, usually pulpwood, for 35 years plus 1 rotation period (typically 8 years for pulpwood.) The license may be renewed for a further 35 years. Licensees are allowed to clear 100 percent of the land area but are required to plant only 25 percent. This limited planting requirement is not always met. Industrial forests are supposed to be established on degraded land, but in practice they are sometimes established after clear-cutting natural forest.

ICRAF: International Centre for Research in Agroforestry

IPK (*Ijin Pemanfaatan Kayu*): A license to clear land for the purposes of establishing industrial timber plantations, agricultural plantations (for example, oil palm), transmigration sites, or other development schemes. Although the ostensible purpose of IPKs is to establish plantations, they are sometimes more highly valued for the roundwood yielded by land clearance. Wood harvested from IPKs provides a major share of total roundwood supplies in Indonesia.

IUCN: World Conservation Union

Limited Production Forest: Forest that is allocated for low-intensity timber production. Typically, limited production forest is found in mountainous areas where steep slopes make logging difficult.

Low Access Forest: A term used in this report to describe primary or mature secondary-growth forests that are relatively undisturbed by human activity. Low access forests are defined according to their area and distance from roads, navigable rivers (in the case of Kalimantan), human settlements, agriculture, mines, and other development. The minimum distance from these features is 0.5-1 km. Low Access Forests allocated for use under an HPH, HTI, or IPK license are defined as potentially low access forests. (See also Accessed Forest.)

MOF: Ministry of Forestry. See also Note 1 of this report.

Natural Forest: Forests composed primarily of indigenous trees that have not been planted by humans. Natural forests exclude plantations.

NFI (National Forest Inventory): The NFI, published in 1996, was undertaken by the Indonesian government (Ministry of Forestry) with financial support from the World Bank and technical assistance from the Food and Agriculture Organization of the United Nations (FAO).

Nonforest: Any land use or land cover category other than forest.

Permanent Forest Status: Land that is legally allocated as part of the national forest estate and falls under the control of the Ministry of Forestry. The term refers to land *use* (land intended for the purposes of forestry) not to land *cover* (land covered with trees). Land under permanent forest status is not necessarily forested and is not therefore the equivalent of forest cover (*see above*).

Plantations: Forest stands established by planting and/or seeding in the process of afforestation or reforestation. They comprise either introduced species (all planted stands) or intensively managed stands of indigenous species. Plantations may be established to provide wood products (timber, pulp) or such agricultural crops as oil palm and coconut.

Production Forest: Forest that falls within the boundaries of a timber concession (under an HPH license) and is managed for timber production. Under good management, harvesting levels are balanced by planting and regrowth so that the forest will continue to produce wood indefinitely. In practice, forests within timber concessions are often heavily logged and sometimes clear-cut.

Protection Forest: Forest that is intended to serve environmental functions, typically to maintain

vegetation cover and soil stability on steep slopes and to protect watersheds.

Reforestation: The establishment by humans of forest cover on land that was formerly forested.

Regrowth: The reappearance of forest on cleared or selectively logged land through natural regeneration.

RePPPProT (The Regional Physical Planning Programme for Transmigration): A national survey, published in 1990, that included a mapping exercise, carried out by the Indonesian government (Ministry of Transmigration) with funds and technical assistance provided by the British government.

Roundwood: All wood in its natural state obtained from felling or other forms of harvesting. Commodities produced from roundwood include sawlogs and veneer logs, pulpwood, wood-based panels, other processed wood products, other industrial roundwood (including mining pitprops), and fuelwood.

Selective Logging/Selective Harvesting: The selective removal of specific tree species or trees of a specific size or other quality. Selective logging, depending on its intensity, may or may not result in partial opening of the canopy cover. Even very low-intensity selective logging may lead to forest degradation if trees are felled carelessly or are removed roughly from the surrounding forest.

UNEP-WCMC: United Nations Environment Programme-World Conservation Monitoring Centre.

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