ANNEX

Annex D1.1.1 Descriptions of Ecoregions in South Sumatra (1/5)

Sumatran Montane Rain Forests Index:IM0159	Location and General Description of the Ecoregion	Sumatra's montane rain forests can be separated into three major forest zones: lower montane forest, upper montane forest, and sub-alpine forest. Temperature and cloud level are the major factors determining these forest zones. The lower montane zone forests are similar to lowland rain forests but begin to get smaller. The canopy height typically is no more than 35 m high. Emergents may extend to 45 . The upper montane zone sharply changes from lowland rain forests. The canopy becomes even and rarely exceeds 20 m. Beyond this forest lies the sub-alpine forest, a complex of grass, heath, and bog areas. Small stunted trees may reach 10 m high, orchids become very rare, but moss, lichen, and liverworts are very abundant.
	Biodiversity Features of the Ecoregion	Sumatra's montane forests contain far higher levels of mammal and bird endemism than the lowland forests. Seven mammal and eight bird species are endemic. The fauna of this ecoregion includes; the serow (*Vapricornis sumatraensis*), Sumatran rhinoceros (*Didernocerus sumatrensis*), Sumatran tiger (*Panthera tigris*), Malayan tapir (*Tapirus indicus*). Primate species are numerous.
	Current Status of the Ecoregion	Despite Sumatra's dense human population, this montane ecoregion contains several large blocks of intact forest. The Kerinci-Seblat National Park, the largest reserve in Sumatra (7,960 km^2 in total), protects the watersheds of two of Sumatra's most important rivers: the Musi and Batang Hari.
	Approximate Original Area in South Sumatra Province (km^2)	10,104 km^2
	Protected Area in South Sumatra Province (km^2)	5,830 km^2
		As Sumatra's remaining lowland rain forest is diminishing, the only remaining natural forests in Sumatra will be the hill and montane forests of this ecoregion. This ecoregion is extremely fragile and sensitive to disturbance, especially in the upper montane and sub-alpine zones. From 1985 to 1997, 15,000 km2 of montane forest was destroyed, more than 1,000 km2/year. Since 1997, this annual rate of forest loss has increased gradually, and after the fall of the Suharto government and economic collapse of 1998, even the large protected areas such as Kerinci Seblat National Parks are threatened by encroachment and poaching. In the Kerinci Seblat National Park, Indonesia's first fully gazetted national park, illegal logging is increasing, and more than 400 families are staking claims along the road bordering the park. The national park is an important site for one of the last remaining populations of the Sumatran rhinoceros and Sumatran rabbit, as well as siamang and agile gibbon. Poaching is another threat to the great diversity of life in these forests. From 1990 to 1996, the number of Sumatran rhinoceros in the Kerinci-Seblat National Park fell from 300 to about 30.

Annex D1.1.1 Descriptions of Ecoregions in South Sumatra (2/5)

Lowland Rain Forests Index: IM0158	Location and General Description of the Ecoregion	Today, to the east of the Barisan Range low hills and plains exist as a result of tectonic and volcanic events. Continued mountain building, volcanic activity, and sedimentation int he lowland occurred over the past 25 million years. The lowland rain forests to the east of the Barisan Range receive rainfall averages more than 2,500 mm/year. The emergent trees in this ecoregion can reach 70 m tall. Ground vegetation usually is sparse, mainly small trees and saplings of canopy species, and herbs are uncommon. There are more than 100 fig species in Sumatra, and are important food sources for many forest animals. Sumatra once contained pure stands of ironwood forests.
	Biodiversity Features of the Ecoregion	Five of the sixteen species of the Rafflesia plant are found in Sumatra and occur mainly in lowland forest, although they have been recorded as high as 1,800 m. There is only one endemic mammal in this ecoregion. The fauna of this ecoregion, however, includes; the dark-handed gibbon (*Hylobates agilis*), the tarsier (*Tarsius bancansus*), Banded leaf-monkey (*Presbytis melalophus*), endangered Malayan Tapir (*Tapirus indicus*), the two-horned Sumatran rhinoceros (*Dicerorhinus sumatrensis*), and the Asian elephant (*Elephas maximus*). The bird fauna consists of more than 450 species.
	Current Status of the Ecoregion	The conservation status of this ecoregion's forest is critical. Even before 1985, only about 1/3 of this ecoregion's natural forests remained. Most of this habitat had been lost to agricultural expansion and logging. The remaining areas of intact habitat are found primarily in central Sumatra. However, encroachment, widespread illegal logging, and fires in the protected areas are severe.
	Approximate Original Area in South Sumatra Province (km^2)	50,522 km^2
	Protected Area in South Sumatra Province (km^2)	726 km^2
	Types and Severity of Threats of the ecoregion	The remaining natural forests in this ecoregion will be completely gone within the next five years unless drastic actions are taken to halt rampant logging. In Sumatra's lowland forests from 1985-1997, the average annual forest loss was about 2,800 km2/year. If the current deforestation trend continues, this ecoregion's natural forests will be gone by 2005. Logging and clearing for plantations and agriculture have been especially heavy in the lowlands east of the Barisan Range, especially since the 1988-99 economic crisis. Extensive stands of ironwood (*Eusideroxylon zwageri*) have been almost entirely destroyed in southern Sumatra.

Annex D1.1.1 Descriptions of Ecoregions in South Sumatra (3/5)

Sumatran Freshwater Swamp Forests Index: IM0157	Location and General Description of the Ecoregion	This ecoregion represents the disjunct patches of freshwater swamp forests along the eastern alluvial plain on the Sumatra. Freshwater swamp forests grow on fertile alluvial soils. Emergent trees attain heights of 50 - 60m.
	Biodiversity Features of the Ecoregion	The freshwater swamp forest fauna is much more diverse than the fauna of peat swamp forests. Many of the characteristic species of lowland rain forests are also found here. They are homes to the Asian elephant (*Elephas maximus*), the endangered Malayan tapir (*Tapirus indicus*), another endangered species the Sumatran tiger (*Panthera tigris*). Numerous primate species live in these forests. The swampy grasslands and forests provide important habitat for many water birds.
	Current Status of the Ecoregion	Less than a fifth of the original extent of natural habitat remains in this severely threatened ecoregion. Freshwater swamp forests have very fertile soils that are suitable for agriculture; therefore, this ecoregion has been intensively converted and exploited. Very little of the remaining habitat is in an undisturbed state, including the areas inside nature reserves.
	Approximate Original Area in South Sumatra Province (km^2)	3,031 km^2
	Protected Area in South Sumatra Province (km^2)	0 km^2
	Types and Severity of Threats of the Ecoregion	The estuarine crocodile and the false ghabial, once numerous in this ecoregion, have been decimated by hunting, both from hear of these animals and for their skins, although the estuarine crocodile is protected by law in Indonesia. Large-scale logging has also occurred throughout this ecoregion, especially from 1968 to 1974, and concessions cover 17 % of the remaining habitat. Several large fires (1972, 1974, 1976, 1982, 1998, and 2000) have also swept through this ecoregion, destroying large tracts of forest. Paperbark, a common secondary growth tree in freshwater swamps, form a highly flammable soil cover, encouraging further burning. Climax communities of this forest, which include 100-year-old dipterocarp trees, are extremely slow to regenerate. Widespread illegal logging, regardless of logging concessions, has occurred through out Indonesia since the economic crises and fall of the Suharto government in 1998. It is doubtful whether any pristine freshwater swamp forests still exist in Sumatra. If any do exist, they will be under intensive pressure in the coming years and probably will be gone within 10 years.

Annex D1.1.1 Descriptions of Ecoregions in South Sumatra (4/5)

Sumatran Peat Swamp Forests Index: IM0160	Location and General Description of the Ecoregion	The peat swamp forests of Sumatra have similar characteristics to those in Borneo and peninsular Malaysia. Peat soil is composed of more than 65 % organic matter. The peat deposits usually are at least 50 cm thick but can extend up to 20 m. Because peat swamps are not drained by flooding, they are nutrient deficient and acidic, with a pH usually less than 4.
	Biodiversity Features of the Ecoregion	Peat swamp forests do not support an abundance of terrestrial wildlife, and none of the mammals are considered endemic. The Sumatran tiger (*Panthera tigris*) and the Asian elephant (*Elephas maximus*) makes peat swamp their habitat. The number of bird species tends to be lower in peat swamp forest than in the surrounding lowland rain forests.
	Current Status of the Ecoregion	More than half of the habitat in this ecoregion has been cleared, especially in the southern portion, where only a few block of habitat remain. Large areas of swamp have been drained, mainly for transmigration settlements and large-scale development projects, making this a highly vulnerable ecoregion.
	Approximate Original Area in South Sumatra Province (km^2)	37,386 km^2 (including mangroves)
	Protected Area in South Sumatra Province (km^2)	4,362 km^2 (including mangroves)
	Types and Severity of Threats of the ecoregion	In some areas of southern Sumatra, the peat swamp has been drained for transmigration and other major development projects. The drainage of one area dries neighboring areas. Therefore, fires are common, preventing natural succession and promoting the development of extensive, nearly pure stands of paperbark (*Melaleuca cajuputih*). In areas there the peat itself is burned, small, shallow lakes form and become covered with floating islands of grasses and herbs. Large-scale plantations, illegal logging, and timber enterprises have also led to increasing deforestation with resultant erosion and sedimentation of nearby rivers. Coconuts are grown along the coast, and drained swamps are used for pineapple plantations. Logging concessions cover almost 80 % of the ecoregion's remaining habitat and pose a serious threat to habitat integrity and conservation.

Annex D1.1.1 Descriptions of Ecoregions in South Sumatra (5/5)

Sunda Shelf Mangroves Index: IM1405	Location and General Description of the Ecoregion	Found on the island of Borneo and the east coast of Sumatra.
	Biodiversity Features of the Ecoregion	This is some of the most biologically diverse mangroves in the world. More than 250 birds are listed for this ecoregion, and many of them are transitory, some migrants. Mangroves provide vital ecological functions by being at the interface between the terrestrial and marine realms. Mangroves stabilize coastlines from erosion, accumulate sediment, and provide a nursery for numerous coastal fishes.
	Current Status of the Ecoregion	Traditionally, mangroves have been harvested for fuel wood, charcoal, and timber. In recent decades, mangroves have been severely degraded by deforestation, agriculture, urban development, fishing, and shrimp farming.
	Approximate Original Area in South Sumatra Province (km^2)	See Peat Swamp Forests
	Protected Area in South Sumatra Province (km^2)	See Peat Swamp Forests
	Types and Severity of Threats of the ecoregion	Many mangroves reside in logging concessions or are being cut down for commercial charcoal production. Production of woodchips and pulp is increasing, and more chip mills are being built. Shrimp farming continues to threaten vast mangrove forests. Other aquaculture practices include cockle culture and exploitation of the finfish, bivalve, and crab fisheries. Pollution and agriculture conversion also threatened mangrove forests.

Source: World Wildlife Fund *"Terrestrial Ecoregions of the Indo-Pacific: A Conservation Assessment"*, Island Press, 2001

Annex D3.1.1 Ministerial Priority List of Watershed for Rehabilitation of Forest and Land

Watershed Forum	Province	Watershed Forum	Province
Ambar Kambas	Lampung	Kuantan	Sumatera barat
Asahan/Toba	Sumatera Utara	Limboto	Gorontalo
Barito	Kalimantan Selatan	Luk Ulo	Jawa Tengah
Bengawan Solo	Jawa Tengah	Masang Antokan	Sumatera Barat
Brantas	Jawa Timur	Opak-Oyo	D.I.Yogyakarta
Ciliwung	DKI, Jawa Barat	Serang-Lusi	Jawa Tengah
Cimanuk	Jawa Barat	Tondano	Sulawesi Utara
Cisadane	Jawa Barat	Tulang Bawang	Lampung
Citarum	Jawa Barat	Walanae	Sulawesi Selatan
Jeneberang Klara	Sulawesi Selatan	Way Sekambung	Lampung
Kampar	Riau	-	-

Source:
Decision among
Coordinating Minister for People's Welfare, No: 09/KEP/MENKO/KESRA/III/2003
Coordinating Minister for Economic Affairs No: KEP.16/M.EKON/03/2003, and
Coordinating Minister for Political and Security Affairs, No: KEP. 08 /MENKO /POLKAM /III/2003
Formation of Coordinating Team for Repair of Environment through National Rehabilitation and Reforestation
(Pembentukan Tim Koordinasi Perbaikan Lingkungan Melalui Rehabilitasi dan Reboisasi Nasional)

Annex D3.1.2 Suggested Priority List for Reforestation and Sedimentation Prevention (Tentative)

Watershed Forum	Watershed Forum
Anai Sualang	Mesuji Tulang Bawang
Asahan	Opak-Oyo
Barito	Serang
Bengawan Solo	Serang-Lusi-Juwana
Brantas	Singkarak
Ciliwung	Tondano
Cisadane	Walanae
Cimanuk	Walange
Citarum	Way Jepara
Jeneberang	Way Rarem
Kahayan	Way Sekampung
Kampar	Way Seputih
Limboto	Maninjau
Lokulo-Dulang	Mesuji Tulang Bawang
Maninjau	-

Source: Ministry of Forestry, Forestry Sector Development Strategy. 2003.7.25

Annex D6.1.1 Land Systems That Has Major Constraints for Agriculture Use

Land Systems	Reason
Bukit Balang, Bukit Pandan, Gnung Gadang, Tanggamus and Telawi land systems	These land systems occur on mountains and have little potential for agricultural development mainly because of steep slopes.
Air Hitam Kanan, Bukit Barangin, Batang Anai, Bukit Masung, Batu Ajan, Maput, Mantalat, Pendreh, Tambera and Ulu Bandar land systems	These land systems occur on steep hills and have little potential for agricultural development mainly because of steep slopes.
Aeknabontair, Dolok Parlajanan, Kalung and Tebing Tinggi land systems	These land systems occur on hillocky land and have little potential for agricultural development mainly because of steep slopes; rock outcrops are extensive in the Kalung land system.
Beliti, Gambut, Kajapah, Klaru and Mendawai land systems	The EU team found that these land systems have little potential for agricultural development because of prolonged flooding and generally swampy conditions. The area is actually used as rice field that does not need artificial irrigation systems.
	Total area 21,220 km^2 (27% of the total Musi River basin)

Source: Musi River Basin Study, Final Report, Annex No. 3 page 6-8, Republic of Indonesia, Ministry of Public Works, Directorate General of Water Resources Development, and Commission of the European Communities, December 1989, Consultancy Contract No. HK 020301-Da/1148

Annex D6.1.2 Land Use Types within the Constraints Area by Sub-Basin

Land Use Type	Rawas	Lakitan	Harileko	Musi	Semangus	Kelingi	Lematang	Ogan	Komering	Padang	Total
Dry Land Agriculture	1,675	325	0	1,826	0	378	412	684	1,563	28	4,892
Mixed Garden	0	356	0	7,091	0	135	3,700	4,542	3,372	384	19,224
Open-type land use	1,675	681	0	8,917	0	513	4,112	5,226	4,935	412	24,115
Big Plantation Area	11,456	2,952	0	2,620	0	0	2,193	2,246	1,219	25	8,304
Forest Plantation	0	0	386	22,834	22	0	0	5,435	7,513	479	36,670
Farmer's Plantation	20,054	7,950	472	115,464	0	14,814	52,647	16,102	66,501	5,915	271,915
Forest-type land use	31,510	10,902	859	140,918	22	14,814	54,840	23,783	75,234	6,419	316,889
Total	33,185	11,583	859	149,835	22	15,327	58,952	29,009	80,169	6,831	341,004

Annex D6.1.3 Logging Concession (HPH) and Mining Activities as of 2001

COMPANY	AREA (km^2)	MuBa	OKI	MuEn	MuRa
Kurnia Musi Plywood company	100	O			
Bumi Pratama Usaha Jaya company	560	O			
Family Jaya company	570	O			
Sentosa Mulya Bahagia company	110	O	O	O	
Sribunian TC company	629		O		
Fatma Bersaudara company	510		O		
SBA Wood Industries company	1,342		O		
Inhutani V company (ex.SST company)	915	O			
Inhutani V company (ex.Tuah Megah company and Palawana company)	354				O
Inhutani V company (ex. Kurnia Musi Plywood)	1,300		O		O
Inhutani V company (ex. Sinar Belanti Jaya company)	780		O		
Inhutani V company (ex.Wai Hitam company)	1,218		O		
Inhutani V company (ex. Daya Penca company)	870		O		
Total	9,258	5	8	1	2

Source: Statistik Kehutanan Tahun 2001, p. V-3

REGENCY	COMPANY'S NAME	TOTAL (HA)
1. Ogan Komering Ulu	Mitra Ogan Company	4,313.0
2. Ogan Komering Ilir	a. Waimusi Agro Indah company	4,123.0
	b. Buluh Cawang P compsny	456.0
	c. Sawit Selatan company	7,878.0
	d. Tania Selatan company	885.0
	e. Agro Nusa Indah company	140.0
	f. Duta Mas Putra Utama company	22,900.0
	g. Duta Agro Sakti	13,000.0
	h. Wachyuni Mandira	30,000.0
3. Musi Rawas	Musi Rindang W company	7,020.0
	Tri Aryanti company	1,730.00
	Barisan Tropical Mining company	11,709.44
4. Musi Banyu Asin	a. Musi Banyu Asin Indah company	8,800.0
	b. Hindoli company	13,740.0
	c. Pinago Utama	2,850.0
	d. Daya Sakti Nusa P comapany	17,000.0
	Pertamina/Gulf resources	243.11
5. Muara Enim	a. Wisma Lukita P.1	1,000.0
	b. X/PIRSUS company	5,316.5
		153,104.1

Source: Statistik Kehutanan Tahun 2001, p. IV-12

Annex D6.2.1 Definition of Designated Forest Area, Forest Land Use, and Non-Forest Land Use

Definition of Designated Protected Forest Areas

Project Area (Protected Forest)	Area designation in Forestry Law No. 41,1999	Area designation in previous law system
Conservation Forest	Hutan konservasi	Hutan suaka alam, Hutan pelestarian alam, Taman buru
Protection Forest	Hutan lindung	Hutan lindung

Definition of Forest Land Use

Land Use Class in 2000	Contents in BAHASA Indonesia	Contents in English
Perkebunan (Plantation)	Perkebunan Besar	Big Plantation
	Perkebunan Rakyat	Farmer's plantation
Hutan (Forest)	Hutan Lebat	Tall-tree Forest
	Hutan Belukar	Shrubs
	Hutan Sejenis	Forest Plantation (one species)

Definition of Non-Forest Land Use

Land Use Class in 2000	Contents in BAHASA Indonesia	Contents in English
Perkampungan (Village)	Kampung, Perumahan, Emplasmen, Lapangan Olahraga, Kuburan	Living area, Housing Emplacement, Sport Court, Grave
Industri (Industry)	Pertanian, Non Pertanian	Agricultural, Not Agricultural
Persawahan (Rice Field)	Irigasi, Tadah Hujan, Pasang Surut 2 x lebih 1 x padi / tahun	Irrigation, Rain Field, Tidal Swamp 2 x plus 1 x paddy / years
Pertanian Tanah Kering Semusim (Dry Land Agriculture)	Tegalan / Ladang, Sayuran	Field / Yard, Vegetables
Kebun (Garden)	Campuran , Sejenis	Mix, One Type
Padang (Moor land)	Padang Rumput, Alang-alang, Semak	Savanna, Sedge, Bushes
Perairan Darat	Kolam Air Tawar, Danau / Situ / Telaga	Fresh Water pond, Lake
(Water Land)	Rawa	Swamp / Marsh
Tanah Terbuka (Open Land)	Tanah Tandus, Tanah Rusak, Tanah terbuka Sementara	Barren Land, Broken Land, Temporary Open Land