



Ministry of Environment and Forestry
Republic of Indonesia



THE STATE OF INDONESIA'S FORESTS 2020



Ministry of Environment and Forestry
Republic of Indonesia

Reprinted in April 2021



THE STATE OF INDONESIA'S FORESTS 2020

JAKARTA, DECEMBER 2020

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Papilio gigon, one of butterfly species found only in the Sulawesi's Sula and Talaud Islands, yet virtually omnipresent in conservation areas.

LOCATION
Bantimurung Bulusaraung National Park,
South Sulawesi

PHOTO BY
Iskandar Kamaruddin (2013)

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Preface

The State of Indonesia's Forests 2020 is an update to the State of Indonesia's Forests 2018. The State of Indonesia's Forests 2020 highlights the latest achievements and progress of the Indonesian Government, under the leadership of President Joko Widodo, to sustainably manage Indonesia's forests and to address global climate change.

This report was developed by a team of contributors from the Ministry of Environment and Forestry and exposes the latest data and information on the management of Indonesia's tropical forests, while illustrating progress made so far.

During Joko Widodo's Presidency, steps are being taken to align forest governance with the following principles: i) improving environment quality as means for achieving sustainable development; ii) utilizing forest resources to support national development on the basis of science, technology and the circular economy; iii) transforming forest communities into factors of production to promote livelihoods and prosperity; iv) delivery of real achievements at the site level.

As Indonesia thrives, an ever-larger-scale demand on forest ecosystem services has emerged. The needs of people living adjacent to forests for subsistence, timber, and non-timber forest products (NTFP) must be met, together with the country's need for sustainable development. Hence multi-stakeholder engagement, especially with grassroots communities, is a priority.

To meet the needs outlined above, policies have been adopted to ensure : i) more access for communities to sustainably utilize forest resources through social forestry;

ii) moratoria on certain new concession permits in primary forests and peatlands; iii) a strict control to peatland management; iv) cessation on the issuance of new coal mining permits; v) development of new forest business configurations; and vi) expediting permits for social forestry infrastructure development in forest areas.

Since 2015 the Indonesian Government has been working to resolve forest land tenure conflicts and improve policies to enhance the participation of communities in forest management. Such targets have been approached by structuring equitable land holdings and land ownership, and by managing forest resources in order to better catalyze the emergence of community-level economic activities, including through the launching of the national Land Reform Program (TORA), expanding social forestry programs and encourage forestry corporations to partner with communities.

Indonesia has also committed to promote sustainable forest resource management, in order to prevent further deforestation and forest degradation, while concurrently enhancing sustainable economic growth. This has been manifested among others through the adoption of Indonesia's sustainable timber certification system and many other policies such as primary forest and peatland moratorium for new licenses. About 66 million hectares have been secured for such purpose. Moratorium on new license for oil palm plantation has also been imposed. In the meantime, strict control and prudent management have been applied to conserve habitats for landscape and wildlife survivals.

There has been a shift from forest management focused mainly on timber management, towards broader forest landscape ecosystem management. This strategic reorientation to manage forests wisely takes into account customary values and biodiversity values.

This publication presents policy and technical highlights undertaken in the forestry sector by the Indonesian Government, and hopefully will be perceived constructively.

I express my gratitude to all those who have contributed and actively participated in the updating The State of Indonesia's Forests 2020; members of the writing team and all editors involved as well as contributors from the private sector. High appreciation is given to the Food and Agriculture Organization of the United Nations (FAO) and the Association of Indonesian Forest Concessionaires (APHI) which have supported the Ministry of Environment and Forestry in the preparation of The State of Indonesia's Forests 2020.

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**THE MINISTER OF
ENVIRONMENT AND FORESTRY**



SITI NURBAYA

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Dr. Siti Nurbaya and Dr. Efransjah, as the editors, coordinated the writing and preparation of the publication, with significant input and contributions from a top-echelon team consisting of representatives of a number of Directorate Generals of the Ministry of Environment and Forestry, including the Directorate General of Forestry Planology and Environmental Administration (DJPCTL); the Directorate General of Climate Change (DJPPPI); the Directorate General of Environmental Pollution and Degradation Control (DJPPKL); the Directorate General of Natural Resources and Ecosystem Conservation (DJKSDAE); the Directorate General of Sustainable Production Forest Management (DJPHPL), the Directorate General of Forest and Environmental Law Enforcement (DJPHLHK); the Directorate General of Social Forestry and Environmental Partnership (DJPSKL); the Directorate General of Management of Watersheds and Protection Forests (DJPDASHL), and the Research, Development, and Innovation Agency (FORDA). The Secretariat General of the Ministry of Environment and Forestry (Secretariat General of MoEF) and Data and Information Center (Pusdatin) provided coordination.

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ABBREVIATIONS AND ACRONYMS

AATHP	ASEAN Agreement on Transboundary Haze Pollution	Bhaskamtib-mas	<i>Bhayangkara Pembina Keamanan dan Ketertiban Masyarakat</i> (Public Order and Safety Development Police Officer)
ACCTHP	ASEAN Coordinating Center on Transboundary Haze Pollution	BIG	<i>Badan Informasi Geospasial</i> (Geospatial Information Agency)
AIKO	Automatic Wood Identification System	BioCF ISFL	BioCarbon Fund Initiative for Sustainable Forest Landscapes
APBD	<i>Anggaran Pendapatan dan Belanja Daerah</i> (Regions Budget)	BK Kehati	<i>Balai Kliring Keanekaragaman Hayati</i> (Biodiversity Clearing House)
APBN	<i>Anggaran Pendapatan dan Belanja Negara</i> (State Budget)	BKPM	<i>Badan Koordinasi Penanaman Modal</i> (Indonesian Investment Coordinating Board)
APHI	APHI Asosiasi Pengusaha Hutan Indonesia (Association of Indonesian Forest Concessionaires)	BKSDA	<i>Balai Konservasi Sumber Daya Alam</i> (Natural Resources Conservation Office)
APL	<i>Areal Penggunaan Lain</i> (Other Use Area)	BLU	<i>Badan Layanan Umum</i> (Public Service Agency)
ASEAN	Association of South East Asian Nations	BMKG	<i>Badan Meteorologi Klimatologi dan Geofisika</i> (Meteorology, Climatology and Geophysics Agency)
ASOEN	ASEAN Senior Officials on Environment	BNPB	<i>Badan Nasional Penanggulangan Bencana</i> (National Agency for Disaster Management)
ASOF	ASEAN Senior Officials on Forestry	BP REDD+	<i>Badan Pengelola Penurunan Emisi Gas Rumah Kaca dari Deforestasi, Degradasi Hutan dan Lahan Gambut</i> (Agency for Reducing Emissions from Deforestation and Forest Degradation)
ATFP	The ASEAN Task Force on Peatlands	BPPT	<i>Badan Pengkajian dan Penerapan Teknologi</i> (Agency for the Assessment and Application of Technology)
Babinsa	<i>Bintara Pembina Desa</i> (Village Guidance Non-Commissioned Military Officer)	BP2LHK	<i>Balai Penelitian dan Pengembangan Lingkungan Hidup dan Kehutanan</i> (Center for Environment and Forestry Research and Development)
BAPI	Biodiversity Action Plan of Indonesia		
Bappenas	<i>Badan Perencanaan Pembangunan Nasional</i> (National Development Planning Agency)		
BAU	Business as Usual		
BBSDLP	<i>Balai Besar Penelitian dan Pengembangan Sumber Daya Lahan Pertanian</i> (Indonesian Center for Agricultural Land Resources Research and Development)		

BPBD	<i>Badan Penanggulangan Bencana Daerah</i> (Regional Agency for Disaster Management)	CO₂	Carbon dioxide	DJPPKL	<i>Direktorat Jenderal Pengendalian Pencemaran dan Kerusakan Lingkungan</i> (Directorate General of Environmental Pollution and Degradation Control)	FREL	Forest Reference Emission Level
BPDASHL	<i>Balai Pengelolaan Daerah Aliran Sungai dan Hutan Lindung</i> (Management of Watersheds and Protected Forest Office)	CO₂e	Carbon dioxide equivalent	DJPSKL	<i>Direktorat Jenderal Perhutanan Sosial dan Kemitraan Lingkungan</i> (Directorate General of Social Forestry and Environmental Partnership)	GCF	Green Climate Fund
BPDASPS	<i>Bina Pengelolaan Daerah Aliran Sungai dan Perhutanan Sosial</i> (Watershed Management and Social Forestry Office)	CoI	Center of Intelligence	DNA	Deoxyribonucleic Acid	GDP	Gross Domestic Product
BPDLH	<i>Badan Pengelola Dana Lingkungan Hidup</i> (Environmental Fund Management Agency)	COP	Conference of the Parties	DNPI	<i>Dewan Nasional Perubahan Iklim</i> (National Council on Climate Change)	GFRA	Global Forest Resources Assessments
BRG	<i>Badan Restorasi Gambut</i> (Peat Restoration Agency)	CSR	Corporate Social Responsibility	DR	<i>Dana Reboisasi</i> (Reforestation Fund)	GFMC	The Global Fire Monitoring Center
BRGM	<i>Badan Restorasi Gambut dan Mangrove</i> (Peat and Mangrove Restoration Agency)	CWP	Community Work Plan	EFDB	Emission Factor Data Base	GHG	Greenhouse Gas
BRWA	<i>Badan Registrasi Wilayah Adat</i> (Adat Territory Registration Agency)	DAS	<i>Daerah Aliran Sungai</i> (Watershed)	ETM+	Enhanced Thematic Mapper Plus	GNRT	<i>Ganti Rugi Nilai Tegakan</i> (Stumpage Compensation)
BTR	Biennial Transparency Report	DBH-DR	<i>Dana Bagi Hasil Dana Reboisasi</i> (Revenue Sharing from Reforestation Fund)	EU	European Union	ha	Hectare
BUMDES	<i>Badan Usaha Milik Desa</i> (Village Owned Enterprise)	DJKSDAE	<i>Direktorat Jenderal Konservasi Sumber Daya Alam dan Ekosistem</i> (Directorate General of Natural Resources and Ecosystem Conservation)	FAO	Food and Agriculture Organization of the United Nations	HA	<i>Hutan Adat</i> (Adat Forest)
BUMN	<i>Badan Usaha Milik Negara</i> (State Owned Enterprise)	DJPDASHL	<i>Direktorat Jenderal Pengendalian Daerah Aliran Sungai dan Hutan Lindung</i> (Directorate General of Management of Watersheds and Protection Forest)	FBEG	<i>Fungsi Budidaya Ekosistem Gambut</i> (Cultivation Function of Peat Ecosystem)	HCVF	High Conservation Value of Forest
CA	<i>Cagar Alam</i> (Strict Nature Reserve)	DJPHLHK	<i>Direktorat Jenderal Pengendalian Daerah Aliran Sungai dan Hutan Lindung</i> (Directorate General of Management of Watersheds and Protection Forest)	FCCPF	Forest Carbon Partnership Facilities	HD	<i>Hutan Desa</i> (Village Forest)
CB	<i>Cagar Biosfer</i> (Biosphere Reserve)	DJPHPL	<i>Direktorat Jenderal Pelaksanaan Hutan Produksi Lestari</i> (Directorate General of Sustainable Production Forest Management)	FEG	<i>Fungsi Ekosistem Gambut</i> (Peat Ecosystem Function)	HIMBARA	<i>Himpunan Bank Negara</i> (State Bank Association)
CBD	Convention on Biological Diversity	DJPKTL	<i>Direktorat Jenderal Penegakan Hukum Lingkungan Hidup dan Kehutanan</i> (Directorate General of Forest and Environmental Law Enforcement)	FLEG	<i>Fungsi Lindung Ekosistem Gambut</i> (Protection Function of Peat Ecosystem)	HK	<i>Hutan Konservasi</i> (Conservation Forest)
CDM	Clean Development Mechanism	DJPHPL	<i>Direktorat Jenderal Pengelolaan Hutan Produksi Lestari</i> (Directorate General of Sustainable Production Forest Management)	FLEGT	Forest Law Enforcement, Governance and Trade	HKm	<i>Hutan Kemasyarakatan</i> (Community Forest)
CCTV	Closed-Circuit Television	DJPPI	<i>Direktorat Jenderal Pengendalian Perubahan Iklim</i> (Directorate General of Climate Change)	FLR	Forest and Land Rehabilitation	HL	<i>Hutan Lindung</i> (Protection Forest)
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora			FMU	Forest Management Unit (<i>Kesatuan Pengelolaan Hutan, KPH</i>)	HP	<i>Hutan Produksi Tetap</i> (Permanent Production Forest)
CM1, CM2	Counter Measure 1, Counter Measure 2			FORDA	Research, Development, and Innovation Agency	HPK	<i>Hutan Produksi yang Dapat Dikonversi</i> (Convertible Production Forest)
						HPT	<i>Hutan Produksi Terbatas</i> (Limited Production Forest)
						HTI	<i>Hutan Tanaman Industri</i> (Industrial Plantation Forest)
						HTR	<i>Hutan Tanaman Rakyat</i> (Community Plantation Forest)
						IBSAP	Indonesian Biodiversity Strategy and Action Plan

ICC MAB	International Coordinating Council of the Man and the Biosphere
IDR	Indonesian Rupiah
IFCA	Indonesia Forest Climate Alliance
IGT	<i>Informasi Geospasial Tematik</i> (Thematic Geospatial Information)
INCAS	Indonesia Carbon Accounting System
INDC	Intended Nationally Determined Contribution
IPCC	Intergovernmental Panel on Climate Change
IPHPS	<i>Izin Pemanfaatan Hutan Perhutanan Sosial</i> (Permit for Social Forestry Utilization)
IPK	<i>Izin Pemanfaatan Kayu</i> (Timber Utilization Permit)
IPPKH	<i>Izin Pinjam Pakai Kawasan Hutan</i> (Forest Area Lease Use License)
IPPU	Industrial Processes and Product Use
ISPA	<i>Infeksi Saluran Pernafasan Akut</i> (Acute Respiratory Infection)
ISPO	Indonesian Sustainable Palm Oil
ITPC	The International Tropical Peatlands Center
IUCN	International Union for Conservation of Nature
IUPHH	<i>Izin Usaha Pemanfaatan Hasil Hutan</i> (Business License for the Utilization of Forest Products)
IUPHHK	<i>Izin Usaha Pemanfaatan Hasil Hutan Kayu</i> (Business License for the Utilization of Timber Forest Products)

IUPHHK-HA	<i>Izin Usaha Pemanfaatan Hasil Hutan Kayu Hutan Alam</i> (Business License for the Utilization of Timber Forest Products in Natural Forest)
IUPHHK-HT	<i>Izin Usaha Pemanfaatan Hasil Hutan Kayu Hutan Tanaman</i> (Business License for the Utilization of Timber Forest Products in Plantation Forest)
IUPHHK-HT	<i>Izin Usaha Pemanfaatan Hasil Hutan Kayu untuk Hutan Tanaman Industri</i> (Business License for Utilization of Timber Forest Products in Industrial Plantation Forest)
IUPHHK-RE	<i>Izin Usaha Pemanfaatan Hasil Hutan Kayu Restorasi Ekosistem</i> (Business License for the Utilization of Timber Forest Products in Ecosystem Restoration Forest)
IUPJL	<i>Izin Usaha Pemanfaatan Jasa Lingkungan</i> (Business License for the Utilization of Environmental Services)
IUPJWA	<i>Ijin Usaha Penyediaan Jasa Wisata Alam</i> (Business License for Nature Tourism Services Provider)
IUP PAN-KARBON	<i>Izin Usaha Pemanfaatan Penyimpanan Karbon</i> (Business License for Utilization of Forest for Carbon Storage)
IUP RAP-KARBON	<i>Izin Usaha Pemanfaatan Penyerapan Karbon</i> (Business License for Utilization of Forest for Carbon Sequestration)
IUPSWA	<i>Ijin Usaha Pengelolaan Sarana Wisata Alam</i> (Business License for Management of Nature Tourism Facilities)
JIC	Joint Implementation Committee
JICA	Japan International Cooperation Agency

JIG	<i>Jaringan Informasi Geospasial</i> (Geospatial Information Network)
JIGN	<i>Jaringan Informasi Geospasial Nasional</i> (National Geospatial Information Network)
JOG	Joint Operations Graphics
KAN	<i>Komite Akreditasi Nasional</i> (National Accreditation Committee)
KBD	<i>Kebun Bibit Desa</i> (Village Nursery)
KBR	<i>Kebun Bibit Rakyat</i> (People's Nursery)
KemenPPN	<i>Kementerian Perencanaan Pembangunan Nasional</i> (Ministry of National Development Planning)
Kementan	<i>Kementarian Pertanian</i> (Ministry of Agriculture)
KHDTK	<i>Kawasan Hutan Dengan Tujuan Khusus</i> (Special Purpose Forest Area)
KHG	<i>Kesatuan Hidrologis Gambut</i> (Peat Hydrological Unit)
KLHK	<i>Kementerian Lingkungan Hidup dan Kehutanan Republik Indonesia</i> (Ministry of Environment and Forestry, Republic of Indonesia/MoEF)
KPA	<i>Kawasan Pelestarian Alam</i> (Nature Conservation Area)
KPH	<i>Kesatuan Pemangkuan Hutan</i> (Forest Management Unit, FMU in Perum Perhutani)
KPH	<i>Kesatuan Pengelolaan Hutan</i> (Forest Management Unit, FMU)
KPHK	<i>Kesatuan Pengelolaan Hutan Konservasi</i> (Conservation Forest Management Unit)

KPHL	<i>Kesatuan Pengelolaan Hutan Lindung</i> (Protection Forest Management Unit)
KPHP	<i>Kesatuan Pengelolaan Hutan Produksi</i> (Production Forest Management Unit)
KSA	<i>Kawasan Suaka Alam</i> (Sanctuary Reserve Area)
KSDAE	<i>Konservasi Sumber Daya Alam dan Ekosistem</i> (Conservation of Natural Resources and Ecosystems)
KUPS	<i>Kelompok Usaha Perhutanan Sosial</i> (Social Forestry Business Group)
KUR	<i>Kredit Usaha Rakyat</i> (People's Business Loan)
K/L	<i>Kementerian/Lembaga</i> (Ministries/Institutions)
LAPAN	<i>Lembaga Penerbangan dan Antariksa Nasional</i> (Indonesian National Institute of Aeronautics and Space)
LDCM	The Landsat Data Continuity Mission
LIPI	<i>Lembaga Ilmu Pengetahuan Indonesia</i> (Indonesian Institute of Sciences)
LMDH	<i>Lembaga Masyarakat Desa Hutan</i> (Forest Village Community Institution)
LULUCF	Land Use, Land-Use Change and Forestry
MAB	Man and Biosphere Program
MHA	<i>Masyarakat Hukum Adat</i> (Adat Law Community)
MODIS	Moderate Resolution Imaging Spectroradiometer
MoEF	Ministry of Environment and Forestry
MoFor	Ministry of Forestry

MoU	Memorandum of Understanding	PIAPS	<i>Peta Indikatif Areal Perhutanan Sosial</i> (Indicative Map of Social Forestry Area)	REDD+	Reducing Emissions from Deforestation and Forest Degradation, Role of Conservation, Sustainable Management of Forest and Enhancement of Forest Carbon Stocks	SeHati Sumsel	<i>Strategi dan Rencana Aksi Keanekaragaman Hayati Sumatera Selatan</i> (South Sumatra Biodiversity Strategy and Action Plan, SSBSAP)
MPA	<i>Masyarakat Peduli Api</i> (Community Fire Awareness Group)	PIPIB	<i>Peta Indikatif Penundaan Pemberian Izin Baru</i> (Indicative Map on the Suspension of the Issuance of New Licenses)	Renstra	<i>Rencana Strategis</i> (Strategic Plan)	SFM	Sustainable Forest Management
MPTS	Multi-Purposes Tree Species	PISA	Problem Identification and Situation Analysis	RHL	<i>Rehabilitasi Hutan dan Lahan</i> (Forest and Land Rehabilitation)	SIDIK	<i>Sistem Informasi dan Data Indeks Kerentanan</i> (Vulnerability Index Data and Information System)
MRV	Monitoring, Reporting and Verification	PKS	<i>Perjanjian Kerja Sama</i> (Cooperative Arrangement)	RIL- C	Reduced Impact Logging - Carbon	SIGANIS	<i>Sistem Informasi Tenaga Teknis</i> (Technical Officer Information System)
MSME	Micro, Small and Medium Enterprises	PLTB	<i>Pengolahan Lahan Tanpa Bakar</i> (Burn-Free Land Management)	RKP	<i>Rencana Kerja Pemerintah</i> (Government Work Plan)	SIGN-SMART	<i>Sistem Inventarisasi Gas Rumah Kaca Nasional, Sederhana, Mudah, Akurat, Ringkas, Transparan</i> (National Greenhouse Gas Inventory System - Simple, Easy, Accurate, Compact, Transparent)
NAP-LDN	National Action Program of Land Degradation Neutrality	PN	<i>Program Nasional</i> (National Program)	RKU	<i>Rencana Kerja Usaha</i> (Business Work Plan)	SILIN	<i>Silvikultur Intensif</i> (Intensive Silviculture)
NDC	Nationally Determined Contribution	PP	<i>Program Prioritas</i> (Priority Program)	RPEG	<i>Rencana Pemulihan Ekosistem Gambut</i> (Peat Ecosystem Restoration Plan)	SILK	<i>Sistem Informasi Legalitas Kayu</i> (Timber Legality Information System)
NFI	National Forest Inventory	PNBP	<i>Penerimaan Negara Bukan Pajak</i> (Non-Tax State Revenue)	RPJMD	<i>Rencana Pengelolaan Hutan Jangka Panjang</i> (Long Term Forest Management Plan)	SLK	<i>Sertifikasi Legalitas Kayu</i> (Certification of Timber Legality)
NFMS	National Forest Monitoring System	POKJA PPS	<i>Kelompok Kerja Percepatan Perhutanan Sosial</i> (Working Group on Social Forestry Acceleration)	RPJMN	<i>Rencana Pembangunan Jangka Menengah Nasional</i> (National Medium-Term Development Plan)	SIMATAG	<i>Sistem Informasi Muka Air Tanah Gambut</i> (Peatland Water Level Information System)
NFP	National Focal Point	POLRI	<i>Kepolisian Republik Indonesia</i> (Indonesian National Police)	RPKH	<i>Rencana Pengelolaan Kawasan Hutan</i> (Forest Area Management Plan)	Simontana	<i>Sistem Monitoring Hutan Nasional</i> (National Forest Monitoring System/NFMS)
NGO	Non-Governmental Organization	PPNS	<i>Penyidik Pegawai Negeri Sipil</i> (Civil Investigator)	SCP	SCP Sustainable Consumption and Production	SIMPONI	<i>Sistem Informasi Penerimaan Negara Bukan Pajak Online</i> (Online Non-Tax State Revenue Information System)
NOAA	National Oceanic and Atmospheric Administration, U.S. Department of Commerce	PROPER	<i>Program Penilaian Peringkat Kinerja Perusahaan dalam Pengelolaan Lingkungan</i> (Corporate Performance Rating Program for Environmental Management)	SDG	Sustainable Development Goals	SiPPEG	<i>Sistem Informasi Pengelolaan dan Perlindungan Ekosistem Gambut</i> (Peatland Ecosystem Protection and Management Information System)
NRS CC	National Registry System on Climate Change	PSDH	<i>Provisi Sumber Daya Hutan</i> (Forest Resource Royalty)	SEA	Strategic Environmental Assessment		
NSDH	<i>Neraca Sumberdaya Hutan</i> (Balance of Forest Resource)	Pusdatin	<i>Pusat Data dan Informasi</i> (Data and Information Center)				
NTFP	Non-Timber Forest Product	RBI	<i>Rupa Bumi Indonesia</i> (Indonesian Base Map)				
OLI	Operational Land Imager	RBM	Resort-Based Management				
OSS	Online Single Submission	RBP	Results-Based Payment				
Permenhut	<i>Peraturan Menteri Kehutanan</i> (Regulation of Minister of Forestry)						
Perpres	<i>Peraturan Presiden</i> (Presidential Regulation)						
PHPL	<i>Pengelolaan Hutan Produksi Lestari</i> (Sustainable Production Forest Management)						

SIPHPL	<i>Sistem Informasi Pengelolaan Hutan Produksi Lestari</i> (Sustainable Production Forest Management Information System)	TACCC	Transparency, Accuracy, Completeness, Comparability, and Consistency	UNFCCC	United Nations Framework Convention on Climate Change
SiPongi	<i>Sistem Monitoring Kebakaran Hutan dan Lahan</i> (Forest and Land Fire Monitoring System)	Tahura	<i>Taman Hutan Raya</i> (Grand Forest Park)	UNSPF	United Nation Strategic Plan on Forests
SIPNBP	<i>Sistem Informasi Penerimaan Negara Bukan Pajak</i> (Non-Tax State Revenue Information System)	TB	<i>Taman Buru</i> (Hunting Park)	USD	United States Dollar
SIPUHH	<i>Sistem Informasi Penatausahaan Hasil Hutan</i> (Forest Product Administration Information System)	TLAS	Timber Legality Assurance System (<i>Sistem Verifikasi Legalitas Kayu</i>)	VNC	Voluntary National Contribution
SIRPBI	<i>Sistem Informasi Rencana Pemenuhan Bahan Baku Industri</i> (Information System for Planning Industrial Raw Material Fulfillment)	TLC	Tiger Conservation Landscape	VPA	Voluntary Partnership Agreement
SIS	<i>Sistem Informasi Safeguards</i> (Safeguards Information System)	TM	Thematic Mapper	WHC	World Heritage Committee
SK	<i>Surat Keputusan</i> (Decree)	TMAT	<i>Tinggi Muka Air Tanah</i> (Water Table)	WMC	World Mangroves Center
SM	<i>Suaka Margasatwa</i> (Wildlife sanctuary)	TMC	<i>Teknologi Modifikasi Cuaca</i> (Weather Modification Technology)	WPK	<i>Wilayah Pengukuran Kinerja</i> (Performance Measurement Area)
SOIFO	The State of Indonesia's Forests	TN	<i>Taman Nasional</i> (National Park)		
SPBK	<i>Sistem Peringkat Bahaya Kebakaran</i> (Fire Danger Rating System)	TNI	<i>Tentara Nasional Indonesia</i> (Indonesian Military)		
SPORC	<i>Satuan Polisi Hutan Reaksi Cepat</i> (Rapid Response Forest Police Unit)	TORA	<i>Tanah Obyek Reforma Agraria</i> (Agrarian Reform Land)		
SPOT	<i>Satellite Pour l'Observation de la Terre</i>	TPT	<i>Tempat Penampungan Terdaftar</i> (Registered Shelter)		
SRN	<i>Sistem Registri Nasional</i> (National Registry System)	TRHS	Tropical Rainforest Heritage of Sumatra		
SVLK	<i>Sistem Verifikasi Legalitas Kayu</i> (Timber Legality Assurance System)	TW-PMPE	Teamwork for Protection and Management of Peatland Ecosystem		
SWTS	Sumatra Wide Tiger Survey	TWA	<i>Taman Wisata Alam</i> (Nature Recreation Park)		
		UNDP	United Nations Development Programme		
		UNEA	United Nations Environment Assembly		
		UNEP	United Nations Environment Programme		
		UNESCO	United Nations Educational, Scientific and Cultural Organization		

GLOSSARY

Adat Community (<i>Masyarakat Adat</i>)	See <i>Adat</i> Law Community, which is usually shortened to <i>Adat</i> Community.
Adat Forest (<i>Hutan Adat, HA</i>)	An <i>Adat</i> Forest is a forest which is located in an <i>Adat</i> Law Community's area.
Adat Law Community (<i>Masyarakat Hukum Adat, MHA</i>)	An <i>Adat</i> Law Community is a group of people settled in a certain geographical area, with demonstrable ancestral ties to that area, with strong relationships with the environment, and with value system that underlie economic, political, social, and legal institutions that are entitled to recognition in accordance with the provisions of national legislation.
Bruto deforestation	<i>Bruto</i> deforestation is defined as the change of land cover classes from the forested (natural and man-made forest) to the non-forested.
Cloud seeding	Cloud seeding is a type of weather modification that aims to change the amount or type of precipitation that falls from clouds by dispersing substances into the air that serve as cloud condensation or ice nuclei, which alter the micro-physical processes within the cloud.
Community Forest (<i>Hutan Kemasyarakatan, HKm</i>)	Community Forest is a type of social forestry license that provides local communities with access to a part of the Forest Area, for the purpose of economically empowering those local communities.
Community Plantation Forest (<i>Hutan Tanaman Rakyat, HTR</i>)	Community Plantation Forest is a social forestry license that allows communities to establish timber plantations in a Production Forest.
Compliance Points	Compliance Points are sites used to conduct groundwater measurements in Peat Ecosystems.
Conservation Forest (<i>Hutan Konservasi</i>)	A Conservation Forest is one of the Forest Area's three main administrative classifications and is assigned to forests set aside for the purpose of conserving the diversity of plants and animals and their ecosystems.
Convertible Production Forest (<i>Hutan Produksi yang Dapat Dikonversi, HPK</i>)	Convertible Production Forest refers to those parts of the Production Forest that may be converted to uses other than forestry.
Deforestation	Deforestation refers to the permanent alteration of forested area to a non-forested area as a result of human activities.
Ecosystem rehabilitation in a Conservation Area	Ecosystem rehabilitation in a Conservation Area refers to efforts to revive ecosystems that have been damaged, including restoring land cover in Conservation Forests, and as well as re-planting and rehabilitating water bodies and seascapes, all for the purpose of returning biological natural resources and their ecosystems to their original condition.
Ecosystem restoration	Ecosystem restoration refers to efforts to restore both the biological (flora and fauna) and non-biological (soil and water) elements of an area of land to its original state so as to facilitate the achievement of biological and ecosystem balance.

Ecosystem restoration in conservation area	Ecosystem restoration in Conservation Area refers to efforts to restore ecosystems that have been damaged, including restoring land cover in Conservation Forests as well as re-planting and rehabilitating water bodies and seascapes, for restoring biological natural resources and their ecosystems to their original condition.
Forest	A forest is defined under the Indonesian Forestry Act of 1999 as a unified ecosystem in a landscape dominated by tree communities, found in the natural world.
Forest and Land Rehabilitation	Efforts to restore, maintain and promote the functions of forests and land so that their capacity, productivity and role in supporting systems of life will be sustained.
Forest Area (<i>Kawasan hutan</i>)	The Forest Area covers more than 60 percent of Indonesia's terrestrial area and has been directed by the government to be maintained as a permanent forest.
Forest Degradation	Forest Degradation refers to decline in forest cover and carbon stocks over a specific period, as a result of human activities
Forest Law Enforcement, Governance and Trade (FLEGT)	FLEGT stands for Forest Law Enforcement, Governance and Trade. The EU published the EU FLEGT Action Plan in 2003. The Action Plan aims to reduce illegal logging by strengthening the sustainability and legality of forest management, improving forest governance and promoting trade in legally produced timber.
Forestry Partnerships (<i>Kemitraan Kehutanan</i>)	Forestry Partnerships are cooperative partnerships between local communities and forest managers, concession holders, service providers, holders of forest land use rights and/or holders of primary forest industry business licenses.
Forest Resource Royalty (<i>Provisi Sumberdaya Hutan, PSDH</i>)	The Forest Resource Royalty is a levy that allows the state to capture a portion of the intrinsic value of forest products removed from the Forest Area.
Grand Forest Park (<i>Taman Hutan Raya</i>)	A type of nature conservation area intended to provide a variety of indigenous and/or introduced plants and animals for research, science, education, breeding enhancement, culture, recreation and tourism purposes.
Gross Deforestation	Gross Deforestation is a loss of only natural forest cover, excluding the dynamic change (harvesting) of the man-made forest class.
Limited Production Forest (<i>Hutan Produksi Terbatas, HPT</i>)	Limited Production Forest refers to those parts of the Production Forest with specific characteristics such as steep slopes, sensitive soil types and high precipitation intensity which, taken together, dictate that these areas be logged less intensively than is permitted in the Permanent Production Forest (<i>Hutan Produksi Tetap</i>).
MPA Paralegal	A community involvement strengthening program through training on legal aspects of forest and land fires, fires prevention and control, carry out integrated patrol activities, and empowering communities to diversify types of livelihoods.

National Park (<i>Taman Nasional</i>)	National Parks are the most common type of nature conservation area. They possess native ecosystems managed through a zoning system and are intended to facilitate research, science, education, breeding enhancement, recreation and tourism.
Natural mechanism	A natural mechanism is one way to remedy the decline of the function of an ecosystem, and entail the protection of processes of natural continuity, with the aim of achieving a balance of biological natural resources and ecosystems and returning them to their original condition.
Nature Conservation Area (<i>Kawasan Pelestarian Alam</i>)	Nature Conservation Area is a specific terrestrial or marine area whose main function is to preserve the diversity of plant and animal species, as well as to allow for the sustainable utilization of living resources and their ecosystems.
Nature Recreation Park (<i>Taman Wisata Alam</i>)	A Nature Recreation Park is a type of nature conservation area mainly intended for recreation and tourism purposes.
Net Deforestation	Net deforestation is defined as the change/reduction of forested land cover classes (natural and man-made forest) over a period of time that accounts for forest re-growth and forest plantations detected by satellite imagery over that same period of time.
Other Use Area (<i>Areal Penggunaan Lain, APL</i>)	Other Use Area refers to public lands which are not designated as Forest Area.
Peat	Peat is a naturally occurring organic material produced from imperfectly decomposed plant residues that accumulates in swamp land, with at least 50 centimeters of thickness.
Peat Ecosystem	A peat ecosystem is an area both in and around a peat swamp, which form a unity as a whole, and are necessary for balance, stability, and productivity.
Peat Hydrological Unit (<i>Kesatuan Hidrologis Gambut, KHG</i>)	A Peat Hydrological Unit is peat ecosystem located between two rivers, between a river and the sea, and/or in a swamp area.
Permanent Production Forest (<i>Hutan Produksi Tetap, HP</i>)	The Permanent Production Forest has characteristics such as less steep slopes, less sensitive soil types and less precipitation intensity, which taken together dictate that these areas may be selectively logged in a normal manner.
Production Forest (<i>Hutan Produksi</i>)	Production Forest is one of the three main classifications found in the Forest Area. Its main function is to produce forest products.
PROPER (<i>Program Penilaian Peringkat Kinerja Perusahaan dalam Pengelolaan Lingkungan, Industrial's Environmental Performance Rating Program</i>)	PROPER refers to a regulatory mechanism which can promote and enforce compliance with pollution control standards, encourage pollution reduction, introduce the concept of "clean technology," and promote an environmental management system and conduct the business ethically through the implementation of community development.
Protection Forest (<i>Hutan Lindung</i>)	Protection Forest is one of the three main types of Forest Area. Its main function is to serve as buffer system, so that water systems may be regulated, floods prevented, erosion controlled, sea water intrusion prevented, and soil fertility maintained.
REDD+	Reducing Emissions from Deforestation and Forest Degradation, Role of Conservation, Sustainable Management of Forest and Enhancement of Forest Carbon Stock.

Reforestation	Reforestation refers to forest and land rehabilitation in which the activity is carried out inside of the Forest Area.
Reforestation Fund (<i>Dana Reboisasi, DR</i>)	The Reforestation Fund is name of a volume-based fee collected on timber felled by natural forest timber concession holders, as well as the name of a Fund into which these fees are placed. The Reforestation Fund is used to finance reforestation and rehabilitation activities.
Regreening	Regreening refers to forest and land rehabilitation activities undertaken outside of the Forest Area.
Revenue Sharing from Reforestation Fund (<i>Dana Bagi Hasil Dana Reboisasi, DBH-DR</i>)	Revenue Sharing (<i>Dana Bagi Hasil, DBH</i>) refers to the sharing by the central government with provincial and/or district governments of percentages of non-tax revenues collected from resource extraction that have taken place within those provinces and/or districts. DBH-DR is the sharing by the central government with provincial and/or district governments of certain percentages of the Reforestation Fund that was collected from natural forest logging that took place within those provinces and/or districts, the proceeds of which may be used not only for reforestation and land rehabilitation, but also to support climate change mitigation and adaptation programs, social forestry schemes, and forest and land fire prevention and control.
Sanctuary Reserve Area (<i>Kawasan Suaka Alam</i>)	Sanctuary Reserve Area refers to a terrestrial or marine Conservation Area which has sanctuary as its main function and which is intended to preserve plant and animal biodiversity, and ecosystems.
Severely degraded land (<i>Lahan Kritis</i>)	Severely degraded land is a land with low soil function to be used as production media, for both plant cultivation as well as naturally grown plants.
Social Forestry	Social Forestry refers to sustainable forest management systems implemented within the Forest Area or titled forest/ <i>Adat</i> forest lands by members of local communities or <i>Adat</i> community groups, intended to facilitate improvements to the welfare, environmental balance and socio-cultural dynamics through establishment of Village Forests, Community Forests, Community Plantation Forests, Private Forests, <i>Adat</i> Forests and Forestry Partnerships.
Strict Nature Reserve (<i>Cagar Alam</i>)	A sanctuary reserve area with a characteristic set of plants, animals and ecosystems, which must be protected and allowed to develop naturally.
Timber Legality Assurance System (<i>Sistem Verifikasi Legalitas Kayu, SVLK</i>)	A system developed to ensure the legality of timber sourced from within Indonesia, in which timber and timber products, derived from forests of all different statuses, both private and state forests, are legally guaranteed and certified as sustainably managed.
Village Forest (<i>Hutan Desa, HD</i>)	A type of social forestry license which is managed by village-level authorities for the benefit and welfare of the village community.
Wildlife Sanctuary (<i>Suaka Margasatwa</i>)	A sanctuary reserve area having a high level of species diversity and/or unique animal species, in which habitat management may be conducted in order to assure the continued existence of these species.

NOTE: The Glossary provides definitions for easy reading of this publication.



Entering a pristine forest

LOCATION
Bukit Tigapuluh National Park, Jambi

PHOTO BY
Asep Ayat (2007)

EXECUTIVE SUMMARY

1. Introduction

This book was developed by the Ministry of Environment and Forestry of the Republic of Indonesia to provide information to the global community regarding the state of Indonesia's forests and forest resources, and to highlight continuing efforts by the Indonesian Government to democratize the allocation of forest resources, to manage the nation's forests sustainably, to prevent deforestation and the degradation of forest resources, and to ensure environmental justice and equality of opportunity for all members of Indonesia's communities, including Customary Law (*Adat*) communities.

The Indonesian Government continues to demonstrate a serious commitment to sustainably manage and utilize forest resources, and has in recent years strengthened its commitment to prevent deforestation and the degradation of forests with recent positive results, such as: the implementation of a system for the certification of sustainable management of forests which is also aimed at stopping illegal logging; heightening the engagement of a specialized unit for law enforcement; and the implementation of a system to resolve conflicts and uphold the land rights and forest tenure of communities in surrounding forest areas, including *Adat* communities. The government also continues to address climate change mitigation and adaptation through its Nationally Determined Contribution to reduce greenhouse gas emissions, and has intensified its commitment to resolve tenurial conflicts related to forest land. Those have been achieved by shifting from a corporate-oriented approach to a more community-oriented approach, aimed at improving sustainable community-level economic development by continuing to ensure more

equitable access to land and forest resources, and promoting community prosperity.

This book consists of a brief introduction (Chapter 1), a portrait of Indonesia's forest areas and the role of the government in sustainable forest management (Chapter 2), a discussion on efforts to control and reduce deforestation in order to enhance global environment benefits, and Indonesia's commitment to halt the development of lands in deep peat soils, and the clearance of new areas of primary forests and peatlands (Chapter 3), a presentation of Indonesia's efforts to improve social forestry practices (Chapter 4); a portrait of efforts to strengthen biodiversity conservation and ecosystem management (Chapter 5); an explanation of sustainable forest management practices to generate income from the forestry sector for national and community welfare (Chapter 6); and a concluding note and reflections on the way forward (Chapter 7).

2. An Overview of Indonesia's Forest Area

A hundred and twenty million hectares of Indonesia, or 64 percent of the nation's entire land area, is designated as the State Forest Area (*Kawasan Hutan*). Most of Indonesia's remaining land area is made up of Non-Forest Area or public lands, known as Other Use Areas (*Areal Penggunaan Lain*, or APL). The Forest Area is managed in accordance with three functions. Production Forests (*Hutan Produksi*, HP) cover a total area of 68.8 million hectares. Conservation Forests (*Hutan Konservasi*, HK) cover a total area of 22.1 million hectares (with an additional 5.3 million hectares of marine conservation areas). Protection Forests (*Hutan Lindung*, HL) have watershed functions and cover the remaining 29.6 million hectares.

Blessed with a tropical climate, Indonesia 17,000+ islands are located between two continents, Asia and Australia, and between two oceans, the Pacific and the Indian Oceans. Because of its geographical location, Indonesia has an extremely high level of biodiversity, and endemism, and has a higher level of biodiversity than any other country in the world, together with Brazil and Colombia. Wildlife species consist of such well-known fauna as the Sumatran tiger, the Sumatran elephant, the Sumatran and Javan rhinoceros, the Kalimantan and Sumatran orangutan, the new discovered Tapanuli orangutan, the anoa (dwarf buffalo), the Komodo dragon and the bird of paradise.

Indonesia's National Medium-Term Development Plan (RPJMN) for 2020 to 2024 aims to achieve a prosperous, equitable, and sustainable Indonesia that reaches middle-high income status. Indonesia's RPJMN for 2020 to 2024 has seven development agendas. The Ministry of Environment and Forestry is directly involved in at least four of these agendas, namely: Strengthening economic resilience for quality and equitable growth; Developing regions to reduce inequality and ensure equal distribution of wealth; Improving the quality and competitiveness of human resources; and Environmental development and enhancing resilience in the face of unforeseen disasters and climate change.

As part of a global effort, the Indonesian Government is committed to do its part under the Paris Agreement and shows progress in the implementation of its Nationally Determined Contribution (NDC), including aspects of both mitigation and adaptation. The Ministry is in the process of reviewing and updating Indonesia's NDC. Currently, Indonesia's 2030 NDC targets for reducing emissions are 29 percent through its own efforts, and up to 41 percent depending upon levels of international cooperation. Indonesia also complies with the Katowice Package as part of its UNFCCC commitments. The package sets out the essential procedures and mechanisms that will operationalize the 2015 Paris Climate Agreement.

Indonesia has over 15 million hectares of environmentally-sensitive peatlands, which cover 12 percent of its forest land and are

found across Indonesia's four major Outer Islands - Sumatra, Kalimantan, Sulawesi and Papua. These peatlands, together with another 9.67 million hectares in associated landscapes, are managed under an area of land administratively designated as the Peat Hydrological Unit (*Kesatuan Hidrologis Gambut*, KHG), which covers 24.67 million hectares.

Protection Forests play a major strategic role in protecting environmental life-support systems by: regulating water supplies; preventing floods; controlling erosion; preventing sea water intrusion; maintaining soil fertility; providing adequate food and energy supplies for human life; and serving as a storehouse of germplasm (living genetic resources such as seeds or tissues that are maintained for the purpose of animal and plant breeding, preservation, and other research uses). In recognition of this vital role, the management of these forests by dedicated Protection Forest Management Units (*Kesatuan Pengelolaan Hutan Lindung*, or KPHL) is being undertaken at the ground level. Indonesia continues managing its protection forests to ensure their protection functions, but also their benefits to communities.

For more than five decades, forest resources have played a significant role in facilitating Indonesia's economic development. The Government introduced a number of new measures to increase the sustainability of the nation's forests, including systems for the certification of forests and chains of custody to ensure the legality of timber.

Starting from 2020 the government has strengthened the national economy, including facilitation of investment in and promotion of wood-based exports, all through the restructuring of regulations, introduction of new innovations, improvements in business support, and strengthening of good business governance for legal certainty.

3. Addressing Deforestation and Forest Degradation

The monitoring of forest resources was conducted periodically, at three-year intervals, between 2000 and 2009. With advances in

remote sensing technologies, since 2011, the monitoring of forest resources has been conducted on a yearly basis, with the process involving the preparation of land cover maps derived from the interpretation of medium resolution satellite images (Landsat 7 ETM+, Landsat 8 OLI) and high-resolution satellite images (SPOT-6, SPOT-7). For each one-year period, the process identifies increases or decreases to the level of deforestation.

The Thematic Geospatial Information System for Forestry, which is fully integrated with the National Geospatial Information Network (*Jaringan Informasi Geospasial Nasional*, JIGN), is intended to facilitate the implementation of Indonesia's One Map Policy (*Kebijakan Satu Peta*). The objective of this policy is to create a single 1: 50,000 scale map that can serve as a geospatial reference, based on a single standard, a single database, and a single geoport.

To ensure greater legal certainty in the management of Forest Areas, measures are being undertaken to clarify the boundaries and administrative designations of Forest Areas in order to show the actual location and legal status of the Forest Area; and to legitimate public recognition regarding community rights on the use of land inside and surrounding the Forest Area.

The Moratorium on the utilization of primary natural forest and peatlands is an extremely significant policy formulated by the Indonesian Government. To implement this policy, the Ministry of Environment and Forestry issued a Ministerial Decree with an Indicative Map for the Suspension of the Issuance of New Licenses for the Utilization of Forest Resources and Forest Areas and Revisions to the Designation of Forest Areas and Other Use Areas (known by the acronym PIPPIB, but more commonly referred to as the moratorium map). The map covers more than 66 million hectares of mostly primary forests and peatlands. Within the 66 million hectares, new concession licenses may no longer be awarded, with exceptions granted for certain licenses that were in the process

of being awarded when the moratorium was initially declared. The moratorium was put into force in 2011 with the issuance of Presidential Instruction (Inpres) Number 10, and was extended by President Joko Widodo in July 2017. In 2019, it was finalized with the issuance of Presidential Instruction Number 5 regarding the permanent cessation of the issuance of new licenses in primary forests and peatlands.

The pressure placed on forested land by economic activities has resulted in disturbance to forest security in the forms of encroachment, illegal logging, forest and land fires, and illegal trade in plants and wildlife. The Indonesian Government is equipped with a number of legal instruments to address these issues and uses both preventative and repressive measures. Work continues to clarify the boundaries between different administrative classifications of Forest Areas; to clarify the legal status of certain Forest Areas; to ensure public legitimacy and recognition; and to provide greater certainty regarding land rights for communities living adjacent to or inside the Forest Area.

Significant forest and land fires occurred again in 2007, 2012 and 2015, causing transboundary haze pollution in the ASEAN region and attracting global attention. In 2014, as one of Indonesia's commitments to mitigate transboundary haze pollution, Indonesia ratified the ASEAN Agreement on Transboundary Haze Pollution (AATHP), which provides a framework for the control of forest and land fires at the regional level.

Since then, programs and activities have been conducted, which include: more effective management of peatland areas, focusing on areas that are particularly prone to forest and land fires; mainstreaming forest and land fire control programs; promoting active participation of all stakeholders; developing early warning systems that provide sufficient lead time to conduct control measures; eliminating and prohibiting the practice of burning to clear lands in high-risk areas, particularly peatlands; continuously

monitoring forests and land fires with improved technologies such as satellites and CCTV, as well as technology application on weather and rainfall, and forest fire awareness community (paralegal).

The 2019 forest and land fires in Indonesia were not as devastating as the 2015 forest and land fires. Learning hard lessons from many years of recurring fires, Indonesia, starting in 2020, has begun to undertake newer measures to prevent and control forest and land fires. Among these measures are cloud seeding operations conducted before the peak of the dry season. Weather modification technology using cloud seeding is mainly carried out in areas that have peatlands or areas that have been predicted to experience severe drought. The Community Fire Awareness Group (MPA) Paralegal is another measure started in early 2020. It is a community involvement and strengthening program based on training in legal aspects of forest and land fires, fire prevention and control, integrated patrol activities, and the empowerment of communities to diversify their livelihoods. A fire prevention campaign has also been intensified with continuous improvement of integrated patrols and fire management. Such efforts have resulted in declining hotspots by 81 percent when detected using NOAA Satellite, while 69 percent decline if detected using Terra-Aqua Satellite, in comparison to the number of hotspots recorded in 2015 for the same period from January to June.

The COVID-19 pandemic has made this year's preparation for forest and land fire mitigation even harder. Nevertheless, with an optimistic attitude, the Forest and Land Fire Brigades (*Manggala Agni*), hand in hand with stakeholders including communities, keep tackling the challenges that arise, through the rearrangement of teams and adaptations in work-shifts, all while involving task forces for the COVID-19 pandemic, and while complying with health and safety protocols.

The Indonesian Government has developed an independent system to monitor its forests at a national scale, called Simontana or the National Forest Monitoring System (NFMS). The NFMS has supported the national Monitoring, Reporting and Verification (MRV) system for climate change adaptation and mitigation, all part of a commitment to promote information transparency.

The 1st National Forest Reference Emissions Level (FREL) was submitted to the UNFCCC in 2016, with a validity period of 2013-2020. In early 2020 the Ministry of Environment and Forestry began to compile the 2nd National FREL and plans to submit it to the UNFCCC for the period of 2021-2030.

With respect to emissions from the forestry sector and peatlands, for the period from 2000 to 2018, the average annual level of emissions stood at 439.8 Mton CO₂e per year. If emissions from peat fires were excluded, the average annual level of emissions would be 213.95 Mton CO₂e.

The implementation of mitigation measures has resulted in a reduction in the level of emissions, particularly emissions from peat fires. Post El-Nino in 2016, the level of emissions from peat fires declined to 90.27 Mton CO₂e from the figure of 822.7 Mton CO₂e recorded in 2015. In 2017, the level of emissions from peat fires declined further, to 12.5 Mton CO₂e. Based on the 2018 GHG inventory, forestry sector GHG emissions amounted to 724 Mton CO₂e, while the baseline NDC (BAU) emissions of the forestry sector for 2018 was 761 Mton CO₂e. The achievement of 2018 GHG emissions reduction for the forestry sector was 37 Mton CO₂e or 1.29 percent of the 2030 NDC emissions reduction target of 17.2 percent. Meanwhile, the level of emissions from peat fires in that year increased again to 121.32 Mton CO₂e.

To avoid the degradation of peatlands and to improve for a better quality of their management, the Government passed

the Regulation on the Protection and Management of the Peat Ecosystem in 2014, which was further amended in 2016. The amended regulation increases protections for the peat ecosystem, based on the importance in preserving water balances, storing carbon, and conserving biodiversity, and strengthens these protections by permanently stopping the issuance of new license on selected areas of peatland in 2019 through the Permanent Moratorium Policy. To guide stakeholders involved in peatland ecosystem protection and management, the National Peatland and Ecosystem Protection and Management Plan (RPPEG) was issued in June 2020.

Indonesia has a greater expanse of tropical peatland than any nation in the world. An inventory of Indonesia's peat ecosystem has been completed, resulting in a national Peat Hydrological Unit. The total extent of Indonesia's peat ecosystem stands at 24.67 million hectares, of which around 9.60 million hectares are located in Sumatra, 8.40 million hectares in Kalimantan, 63.29 thousand hectares in Sulawesi, and 6.59 million hectares in Papua.

The Regulation on the Protection and Management of the Peat Ecosystem mandates the retroactive restoration of certain deep peat areas converted in the past by industrial timber and oil palm plantations. Restoration activities are also being conducted in logged-over areas of natural forests under the auspices of ecosystem restoration concessions (IUPHHK-RE). The basic principles of ecosystem restoration concessions are to maintain forest functions (including the existing administrative status of Forest Area); to ensure forest protection and maintenance (conservation); to restore levels of biodiversity and non-biological diversity (restoration), to optimize the utilization of non-timber forest products and environmental services, to achieve sustainability, and to facilitate rehabilitation, including biodiversity and ecosystem services from mangroves.

As a country with vast peatlands and mangroves ecosystems, Indonesia plays a significant role in conserving these vulnerable ecosystems globally. Its role has been carried out by maintaining its commitments and strengthening global collaboration in relation



Traveling along the river using a traditional boat to enjoy the riparian forest and habitat of orangutans

LOCATION
Tanjung Puting National Park,
Central Kalimantan

PHOTO BY
Iskandar Kamaruddin (2019)

to conservation and sustainable management of tropical peatlands and mangroves. These have been manifested through the establishment of the International Tropical Peatlands Center (ITPC) in October 2018 and an initiative to establish a World Mangroves Center (WMC). ITPC was established jointly with the Democratic Republic of Congo, the Republic of Congo and Peru, and supported by the Center for International Forestry Research (CIFOR), the United Nations Environment Programme (UNEP) and the UN Food and Agriculture Organization (FAO). Meanwhile, it is expected that an international cooperation hub that promotes sustainable mangrove management will be achieved through a WMC. To support those activities, in December 2020 President Jokowi decided for the extension of Peat Restoration Agency (BRG) with inclusion of mangrove management and becoming Peat and Mangrove Restoration Agency (BRGM).

4. Roles of Communities in Sustainable Forest Management

The 2015 to 2019 target set by the National Medium-Term Development Plan (RPJMN) for the awarding of Social Forestry licenses was 12.7 million hectares. As of May 2020, the distribution of 4,147,875 hectares of social forestry access to 6,620 forest farmer groups was assisted by 1,250 extension workers. This distribution of forest access has enabled the creation of 7,311 social forestry business groups, which are successfully increasing the productivity and value of on-farm and off-farm commodities, and of village small-scale industries.

Adat Forests (*Hutan Adat*) are a Social Forestry program prioritized by the President. *Adat* Forests are defined as forests located within territories over which *Adat* communities hold traditional rights (*Adat*). In order to bring

the nation's forest regulation in line with a high-profile decision by Indonesia's Constitutional Court in 2013 concerning *Adat* forests, the Ministry of Environment and Forestry issued a new regulation on Rights Forest in 2015. In 2019, this regulation was repealed and replaced by Ministerial Regulation on *Adat* Forests and Rights Forest. President Joko Widodo has given recognition to 66 *Adat* forests covering of 44,629.34 hectares, spread through the provinces of West Sumatra, South Sumatra, Riau, Jambi, Central Sulawesi, South Sulawesi, Central Sulawesi, West Kalimantan, East Kalimantan, Central Kalimantan, Banten, West Java, Central Java and Bali. Meanwhile, 914,927 hectares of *Adat* territory which have been managed by 94 communities was then designated by the Ministry of Environment and Forestry as Indicative *Adat* Forest.

The Ministry of Environment and Forestry manages the forests through Forest Management Units (Kesatuan Pengelolaan Hutan, or KPH). KPH take three forms, one of which is the Protection Forest Management Unit (*Kesatuan Pengelolaan Hutan Lindung*, KPHL). KPHL focus not only on managing the nation's Protection Forests, but also facilitating community participation in programs related to the collection and utilization of non-timber forest products and the provision of environmental services. At the site level, Protection Forest management activities involve facilitation of and assistance to communities to utilize these areas to support their welfare, and protect the functions of these forests.

A number of research and development activities have been conducted. Among others are those related to NTFP, HKm (or *Hutan Kemasyarakatan* a type of social forestry license), agroforestry, and community capacity building.

5. Strengthening Biodiversity Conservation and Ecosystem Management

Indonesia has 554 designated conservation areas spread throughout all provinces of the country, covering a total area of 27.4 million hectares, of which 5.3 million hectares are marine conservation areas. Conservation

areas face significant and complex pressures, many of which have the potential to result in the degradation and fragmentation of habitat, leading to so-called “Ecological Islands.”

For 25 endangered species found in Indonesia and listed on the International Union for the Conservation of Nature (IUCN) Red List of Threatened Species, Indonesia has established a target to increase the populations of these 25 threatened species. Because of recorded births amongst the populations of nine of these endangered wildlife species in 2017 (see The State of Indonesia's Forests 2018 for reference), an average increase in population of 0.82 percent took place among all 25. This more than quadrupled to 3.67 percent in 2018 due to recorded births that year amongst populations of 19 of these endangered species. Those born in 2018 included a Proboscis Monkey in Yokohama Zoo as a part of a breeding loans collaboration program between Indonesia and Japan. Births like this of priority species in conservation institutions (ex situ) is expected to supplement efforts to increase protected animal populations in nature (*in situ*). As for 2019, protected animals born included two Sumatran elephants in Way Kambas National Park, four Javan rhinos in Ujung Kulon National Park, four banteng bulls in Meru Betiri National Park, Baluran National Park, and Kayan Mentarang National Park, one Javan eagle in Gunung Gede Pangrango National Park, and seven orangutans in Sumatra and Kalimantan. Based on the results of population monitoring that is routinely carried out in Komodo National Park, the population of Komodo dragons increased from 2,897 individuals in 2018 to become 3,022 individuals by the end of 2019, or there was an increase of 125 individuals (4.31 percent) in the population. In 2020, the good news is the birth of 2 individuals of Javan rhinos. Thus, until August this year, the Javan Rhino population is 74 individuals, consisting of 40 males and 34 females, with

an age composition consisting of 15 juveniles and 59 adults.

Since 2015, Indonesia has accepted repatriation from Thailand and Kuwait of 19 orangutan that were victims of the illegal wildlife trade. From 2015 to 2019, a total of 1,795 wild animals were repatriated to Indonesia. In addition, during those same years, 917 wild animals were rescued, and a total of 101,061 wild animals were released into the wild. These latter two activities involved 29 special conservation institutions, consisting of nine Animal Rescue Centers, 12 Animal Rehabilitation Centers and eight Special Wildlife Animal Training Centers.

Much of Indonesia's population continues to depend upon forest resources. Of the 74,954 villages in Indonesia, about 25,800 villages, or 34.1 percent of the total, are located at the fringes of, or inside, the Forest Areas. As many as 6,381 villages are on the fringes of or inside the 22 million hectares of Conservation Forest, with a significant proportion of the population of these villages relying on forest resources for their livelihoods.

From 2015 to 2019, conservation programs have been conducted to enable communities to access and utilize non-timber forest products in up to 579,208 hectares of designated traditional zones, in national parks. These zones may be utilized for the benefit of communities that have traditionally been dependent on certain non-timber forest products found in these zones. Through these partnership arrangements, conservation areas have contributed to improving the welfare of 8,103 households in 192 villages living in or at the fringes of 54 national parks.

To avoid biodiversity loss and ecosystem deterioration, the government will focus from the year 2020 forward on strengthening the conservation of plant and wild animal biodiversity and ecosystems. Progress has been made to achieve ideal management concept through stakeholders consultation regarding the conservation status of biodiversity existence beyond the state forest

land, which could actually be considered as conservation areas under the government authorities.

Indonesia is recognized as being one of the most important countries in the world for the preservation of biodiversity. As such, Indonesia has ratified a number of international agreements and conventions related to biodiversity, including the Convention on Biological Diversity (CBD), the UNESCO Man and Biosphere Program (MAB), the World Heritage Convention, the Convention on the International Trade of Endangered Species of Wild Fauna and Flora (CITES), and the Ramsar Convention (the Convention on Wetlands of International Importance as Waterfowl Habitat).

6. Forests for the National Economy and the Role of Private Sector

Indonesia's Production Forests cover an area of 68.8 million hectares, of which concessions currently occupy 34.18 million hectares, while the remaining 34.62 million hectares are without such concessions. Of the area granted in concessions about 55 percent (about 18.8 million hectares) are for the selective felling of natural forest timber (IUPHHK-HA) while about 33 percent (about 11.27 million hectares) are for the planting of industrial timber (IUPHHK-HT), 2 percent (about 0.62 million hectares) are allocated for ecosystem restoration (IUPHHK-RE), and 10 percent or 3.49 million hectares are allocated for other forest uses, such as collecting non-timber forest products (IUPHHBK), environmental services business (IUPJL), and social forestry schemes. The first two types of concessions are the main producers of logs for Indonesia's pulp and paper, plywood, and sawn timber sectors. Upstream and downstream, all these activities together amount to about 5 percent of the national economy.

Meanwhile, of the 34.62 million hectares of Production Forest that are not licensed, 9.88 million hectares of primary forests in this classification is now permanently protected by the PIPPIB moratorium map, 7.69 million hectares is classified as 'Specific Areas' (*Wilayah Tertentu*, WT) managed by the subset of 167 Production Forest Management Units (KPHP) which have obtained approval of their Long-Term Forest Management Plans, 10.04 million hectares is Convertible Production Forest (HPK), 3.55 million hectares is reserved for future allocation for social forestry schemes, and 3.46 million hectares is reserved for future allocation for forest utilization business licenses (IUPHHK-HA/HT/RE).

From 2011 to 2019, fees and royalties from the forestry sector alone amounted to USD 2.18 billion. Major forest-related fees and royalties include payments into the Reforestation Fund, the Forest Resource Royalty, the Forest Product Utilization Business License Fee, the Environmental Services Utilization Business License Fee, and Forest Exploitation Violation Fines and Stumpage Compensation - a requirement that trees felled illegally by timber concessionaires will be charged royalties ten times higher than normal regulated levels. Forest products exports between 2013 and 2019 averaged USD 9.5 billion per year.

The Government has taken a number of far-reaching measures to minimize unsustainable and illegal forest production practices. Indonesia has a mandatory national system for the certification of forest sustainability known as PHPL. It also has a national chain of custody system which ensures the legality of timber (SVLK) which in turn has allowed Indonesia to be the first nation in the world to successfully complete a legal timber trade agreement with the EU. Detail regarding SVLK may be seen in the SIPUHH-online system. There is also an internet-based system to facilitate improvements in non-tax revenue collection (SIPNBP).

In order to increase the economic value of Production Forests, a paradigm shift is underway from timber management to forest landscapes management. This transformation is resulting in the more holistic management of forest landscapes. Forest management is oriented toward multiple uses of the nation's forests, both timber and non-timber forest products as well as environmental services. Going forward, the government will allow natural forest timber concessions (IUPHHK-HA) and industrial timber plantations (IUPHHK-HT) to pursue multiple business opportunities, including agroforestry, and no longer require that they limit their efforts to timber production.

7. Concluding Notes and the Way Forward

Fundamental changes undertaken through corrective measures aimed at improving the overall forest ecosystem should be manifested in improvements in: (a) the quality of forest cover and ecosystems to support human life, pollution control, watershed management, biodiversity, and the mitigation of climate change; (b) the functions of forests in supporting human life, producing goods and services and conserving biodiversity; and (c) the balance between the ecosystem and natural resources within a landscape.

In 2020, the early phase of President Jokowi's second term, the COVID-19 pandemic has eroded the quality of all virtually aspects of life in Indonesia, including the forestry sector. This difficult situation has impeded the Ministry of Environment and Forestry's efforts as well as threatened what has been achieved over the last several years. The national budgetary allocation for managing forests and the environment has been halved to cope with the urgency of the pandemic.

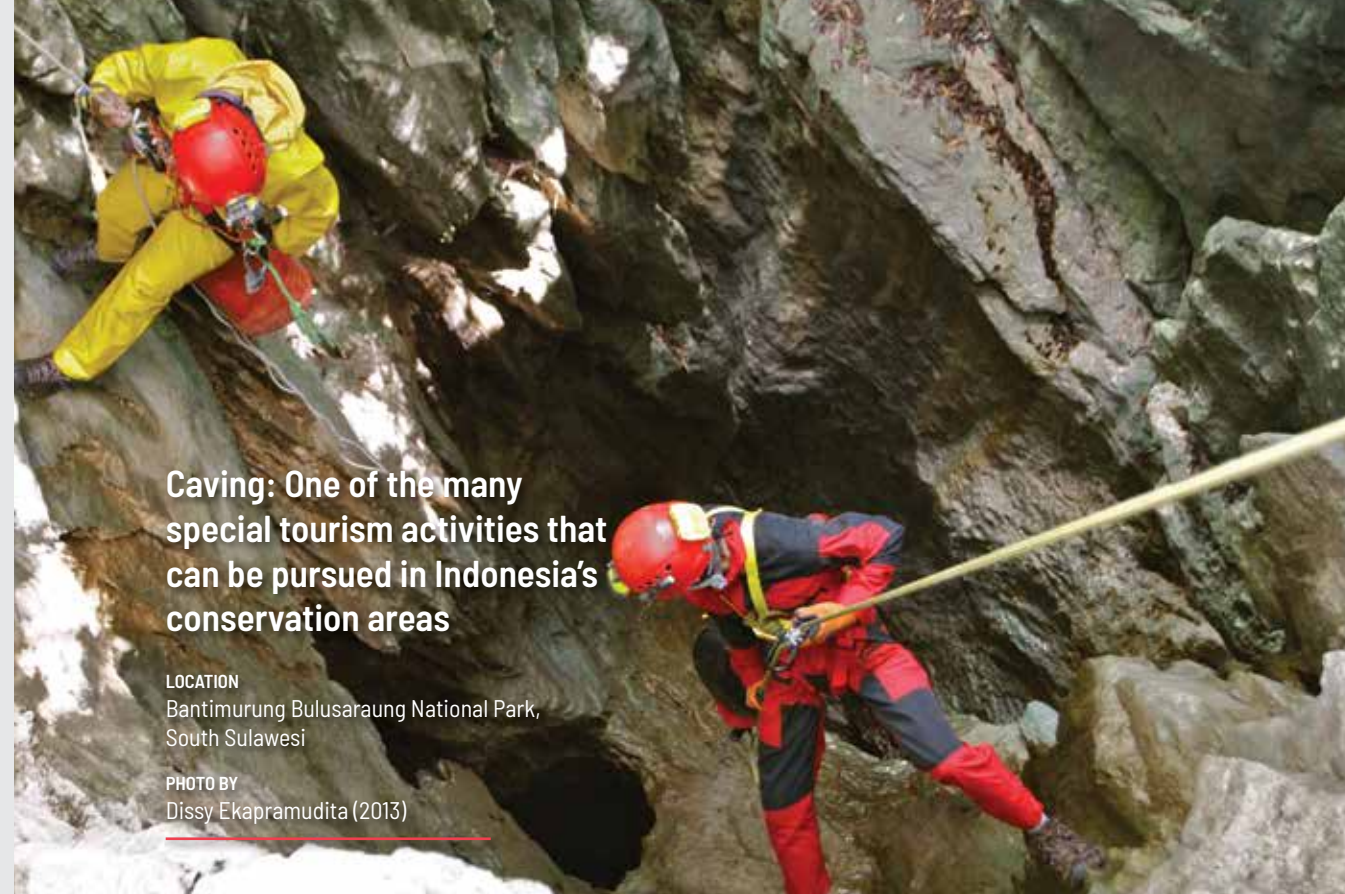
Nevertheless, the Government is still confident that by prioritizing activities and being consistent in undertaking corrective measures, Indonesia can always progress

towards sustainable forestry and achieving all targets under the Sustainable Development Goals.

Indonesia aims to keep the forestry sector stable by ensuring continuity in forestry businesses through: relaxing some procedures, delaying loan repayments, extending grace periods, optimizing state budgets and prioritizing labour-intensive activities through social forestry programs.

To improve the quality of its social forestry programs, the government has introduced e-learning, especially for smallholders. The government also provides incentives for forest farmers, such as for seeds, fertilizers, and pesticides. Other measures to cope with the COVID-19 pandemic include ensuring that wildlife in ex-situ conservation areas has sufficient supplies of food, improving non-timber forest products marketing, enriching law enforcement efforts through taking a restorative justice approach, and Initiating a 'forest healing' program to use the forest for health purposes (physical and mental health recovery).

With the vision of President Joko Widodo in ensuring the provision of a healthy environment for all citizens, consistent policies and corrective measures have been adopted. These include: (1) permanently ceasing the issuance of new licenses in primary forests and some peatlands; (2) enhancing restoration of forest landscapes, social forestry, forest fire control, as well as, improving the effectiveness of conservation management; (3) increasing the participation of business communities in land rehabilitation; (4) rehabilitating 637,000 hectares of severely degraded mangrove forest by 2024; (5) developing corridors connecting fragmented habitats to promote sustainable biodiversity; (6) maintaining conservation areas that have been recognized by World Heritage, Ramsar, and others; and (7) scaling up best practices in research and education forests, as well as community forests; (8) establishment of 1.02 million hectares (so far) of new High Conservation Value Forest in the concession of oil palm estates.



Caving: One of the many special tourism activities that can be pursued in Indonesia's conservation areas

LOCATION

Bantimurung Bulusaraung National Park,
South Sulawesi

PHOTO BY

Dissy Ekapramudita (2013)

These and other policies allow the Government to continue to uphold its commitment to reduce the rate of deforestation, controlling forest and land fires, make progress in REDD+ and NDC implementation, enhance conservation of natural forests, scenic beauty and biodiversity, provide more forest access to communities for their livelihoods, advance social forestry, maintain law enforcement and contribute to the national economy and workforce.

Good environmental governance is the core concept used to manage Indonesia's forests at the level of the ecosystem. With reference to the vision agreed upon at the 1992 Earth Summit in Rio de Janeiro, Brazil, the concept of sustainable development has also been adopted into Indonesia's long-term economic management, is implemented with available technology, and is consistent with the highest forms of human civilization.

Good environmental governance guides the formulation and implementation of Indonesia's forest policy and is driven by: (1) scientific development and improved understandings; (2) an evolving conceptual framework; (3) work results that provide solutions; (4) social relevance; (5) linkage

with the planning process; and (6) efforts to influence policy makers.

Good environmental governance takes into account the important roles of actors who influence the environment, such as NGOs, civil society, business and government. Cooperation and synergy are critical steps to achieve effective governance towards a sustainable future.

By strengthening collaborative and concerted action amongst the global community, Indonesia believes that the world will be able to build back better and that forests will continue to flourish and provide ecosystem services for the country and for the people's welfare.



Park rangers patrol the Sekonyer River

LOCATION
Tanjung Puting National Park,
Central Kalimantan

PHOTO BY
Iskandar Kamaruddin (2019)

CHAPTER 1

Introduction

This publication was written by the Ministry of Environment and Forestry (*Kementerian Lingkungan Hidup dan Kehutanan or KLHK*), Republic of Indonesia. The aims are to provide continuation of information to the global community regarding the state of Indonesia's forests and forest resources and the progress made by the Indonesian Government to strategically manage its forest resources; to prevent and minimize deforestation and the degradation of forest resources; to increase the quality of forests and the environment; and to ensure environmental justice and equal opportunity for all members of Indonesia's communities, including *Adat* communities, to secure better access to forest resources.

Consistent with the previous effort undertaken from 2015 to 2019, for the years 2020 to 2024 the Indonesian Government has expressed a strong commitment to achieving better management and utilization of forest resources. It has intensified its commitment and actions to prevent deforestation and the degradation of forest resources, including certification of the sustainable management of forests, the engagement of specialized units for law enforcement, and effectively utilizing systems to resolve conflicts related to forest tenure involving communities, with more attention to *Adat* communities through the Social Forestry program.

The Indonesian Government has implemented a wide range of policies intended to facilitate the effective management of peat ecosystems that are located within Industrial Plantation Forests and large agricultural



The Hidden Paradise of Waikanabu Waterfall

LOCATION

Waikanabu Waterfall, Manupeu Tanah Daru and Laiwangi Wanggameti National Park, East Nusa Tenggara

PHOTO BY

Simon Onggo (2016)

(especially oil palm) plantations. New policies to manage these peat ecosystems are intended to better prevent peatland fires in both agricultural and forest plantations. These measures are implemented to mitigate the negative impact that these fires would otherwise have on the environment, on public health, on transportation facilities, and on community-level economic growth. All companies and citizens are required to comply with these government policies.

Fire prevention and good fires management represent a serious commitment from the government to protect the nation's forests from any disturbance, especially fires, by engaging stakeholder collaboration. A reflection of Indonesia's national and international commitments, these preventative measures are implemented through policies intended to control small fires before they get out of

control. Efforts are being made to facilitate the full participation of all elements of the community and of governments at all levels, including the full participation of NGOs, the corporate sector and regional military and police commands. At the field level, fire prevention and management are carried out by integrated fire patrols.

The Government continues to provide support for the establishment of community-based organizations such as Community Fire Awareness (*Masyarakat Peduli Api*) groups. The Ministry of Environment and Forestry's working units also play an active role in preventing, monitoring, and responding in a timely manner to forest and land fires, and in enforcing prevailing laws. These efforts have played a significant role in reducing the incidence of hotspots, with a corresponding reduction in the area of land affected by fires.



Landscape of Danau Sentarum National Park: A newly designated Biosphere Reserve in the Heart of Borneo

LOCATION
Kapas Hulu, West Kalimantan

PHOTO BY
Setditjen PSKL (2019)

A range of government authorities at all levels have worked with the broader community to facilitate the effective management of forest and land fires.

The Government of Indonesia continues to commit and implement agendas on reducing climate change impacts and ensuring that average global temperatures will not increase beyond two degrees Celsius. This commitment is expressed in Indonesia's Nationally Determined Contribution (NDC) submitted to UNFCCC, which provides guidance to all economic sectors, including forestry.

A number of significant steps have been taken to improve the management of forest resources and the forestry sector, including: measures to improve the institutional capacities of Forest Management Units (FMU); reforestation initiatives; planting programs in areas allocated

for community-based social forestry programs; measures to prevent deforestation by reducing and controlling the harvesting of timber in the Forest Area and in peatlands; and the implementation of a partial moratorium on the "release" (permanent removal from the Forest Area) of the Forest Area for the development of agricultural plantations. The Indonesian Government has promulgated Act No. 16, 2016, which expressly manifests the Government's commitment to comply with the terms of the Paris Agreement of 2015. Through this and other means, the Indonesian Government has demonstrated a strong political and policy-level commitments to controlling climate change at the global and national levels.

Since 2015, the Indonesian Government has intensified its commitment to resolve tenurial conflicts related to forestland. Starting

from 2020, tenurial conflicts will be mapped for achieving better resolutions. Government tenurial conflict resolution is increasingly characterized by a community-oriented approach which is intended to improve community-level economic development by ensuring more equitable access to land and forest resources, and to promote community prosperity. More equitable access to land and forest resources is being achieved through the implementation of policies to designate a significant portion of the Forest Area for agrarian reform programs (*tanah obyek reforma agraria*, TORA) and through social forestry. One of the main concerns of the TORA Program is the aspect of economic justice, through (1) easing of access to land, (2) providing business opportunities for communities, and (3) improvement of rural

human resources through vocational training, and increased interactions with businesses and the private sector.

The total area of land from the Forest Area that is available for agrarian reform (TORA) is approximately 4.97 million hectares, spread across 26 provinces. Meanwhile, the total target of Forest Area to be utilized for social forestry programs is 12.7 million hectares nationwide. If these targets are achieved, this will represent a significant positive step. The Ministry of Environment and Forestry has promulgated a range of regulations to support both TORA and social forestry. These programs are intended to ensure the achievement of social justice and equality in the area of land holding and the use of forest resources by communities throughout Indonesia.

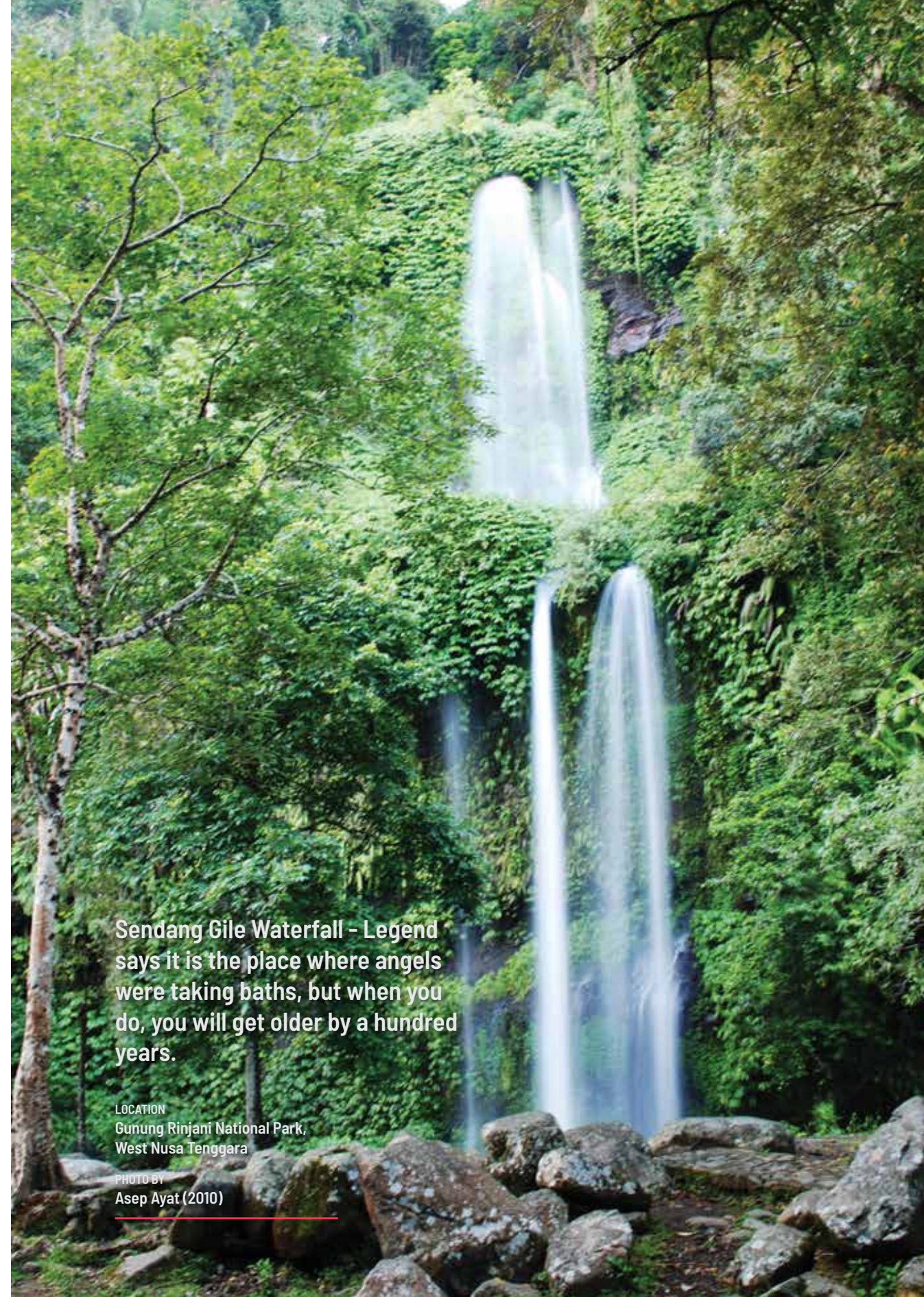
The Indonesian Government is currently working hard to address issues related to inequality to ensure that all Indonesians, particularly farmers and those in rural areas, benefit from improved living standards and welfare, economic justice through access to land, and business opportunities and vocational training.

The spread of the COVID-19 pandemic throughout Indonesia since early 2020 has encouraged the Government of Indonesia to redouble its efforts to protect the nation's forests and its rich biodiversity from fires and illegal logging, to support the needs of communities living in and around the Forest Area, and to minimize the impact of the pandemic.

It is hoped that this book will raise the awareness of the international community regarding the change in Indonesia's paradigm for the management of forest resources, with a new perspective that aims to ensure that

forest resources are utilized more to meet the basic needs of the community, than to benefit large corporations.

This book consists of seven chapters. The first and second present a portrait of Indonesia's forest areas and interventions of the Government in sustainable forest management. Chapter 3 is a discussion about deforestation and efforts to control and reduce deforestation in order to generate Global Environment Benefits, and Indonesia's moratoria on deep peat and primary forest clearance. Chapter 4 describes Indonesia's social forestry program. Chapter 5 displays new directions and trends in the management of conservation areas. Chapter 6 addresses issues related to sustainable forest management practices to generate income from the forestry sector for national and community welfare. The last chapter is a conclusion, and reflection on the way forward.



Sendang Gile Waterfall - Legend says it is the place where angels were taking baths, but when you do, you will get older by a hundred years.

LOCATION
Gunung Rinjani National Park,
West Nusa Tenggara

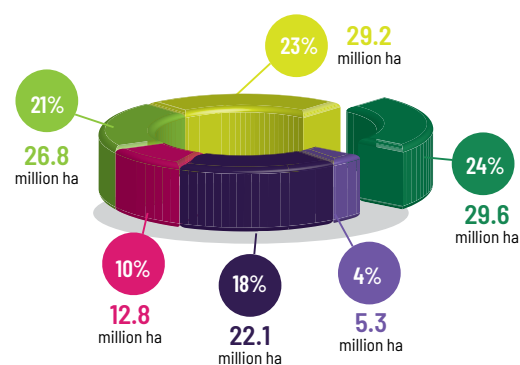
PHOTO BY
Asep Ayat (2010)

CHAPTER 2

An Overview of Indonesia's Forest Area

2.1 Forest Land Status

Indonesia is the world's largest archipelagic nation, with 120.5 million hectares of land, or 64 percent of its total land area, designated as the national Forest Area,¹ with most of the remaining public land being designated for other purposes (*Areal Penggunaan Lain*, or APL²). In addition, 5.3 million hectares of its territorial waters have been designated as marine conservation areas (*kawasan konservasi perairan*) within the mandate of the Ministry of Environment and Forestry. These public forests and marine conservation areas are designated on the basis of a Decree of the Minister of Environment and Forestry on the Extent of Indonesia's Forest Area and Marine Conservation Areas. As of December 2019, the total of these areas stood at 125.8 million hectares (see Figure 2.1, map is presented in Appendix 1).



- HP
- HPT
- HPK
- KSA/KPA darat (terrestrial)
- KSA/KPA laut (marine)
- HL

- KSA Kawasan Suaka Alam (Sanctuary Reserve Area)
- KPA Kawasan Pelestarian Alam (Nature Conservation Area)
- HL Kawasan Hutan Lindung (Protection Forest)
- HP Hutan Produksi Tetap (Permanent Production Forest)
- HPT Hutan Produksi Terbatas (Limited Production Forest)
- HPK Hutan Produksi yang Dapat Dikonversi (Convertible Production Forest)

SOURCE: KLHK, 2020a

► FIGURE 2.1 Areas allocated to various land uses in the forest land and marine conservation

¹ Forest Area is a particular area appointed and stipulated by the Government to be maintained as a permanent forest.

² Total area of APL is calculated by taking the total area of all provinces in Indonesia (source: www.bps.co.id), and subtracting from that figure the total area of Terrestrial Forest Area, therefore it is possible that there are APL in Marine Conservation Areas which are not calculated.

As shown in Figure 2.1, Indonesia's Forest Area is categorized into three different functions: production forest (*Hutan Produksi*, HP, 68.8 million hectares), protection forest (*Hutan Lindung*, HL, 29.6 million hectares), and conservation forest (*Hutan Konservasi*, HK, 22.1 million hectares). Production forest area consists of Permanent Production Forest (*Hutan Produksi Tetap*, HP), Limited Production Forest (*Hutan Produksi Terbatas*, HPT), and Convertible Production Forest (*Hutan Produksi yang Dapat Dikonversi*, HPK).

The conservation forest area is categorized into Sanctuary Reserve Areas (*Kawasan Suaka Alam*, KSA) and Nature Conservation Areas (*Kawasan Pelestarian Alam*, KPA). KSA consist of Strict Nature Reserves (*Cagar Alam*, CA) and Wildlife Sanctuaries (*Suaka Margasatwa*, SM). Meanwhile, KPA consist of National Parks (*Taman Nasional*, TN), Nature Recreation Parks (*Taman Wisata Alam*, TWA), and Grand Forest Parks (*Taman Hutan Raya*, Tahura). KSA/KPA can be terrestrial or marine. All types of KSA/KPA with a majority of area on land are classified as terrestrial KSA/KPA (KSA/KPA darat) and cover a total of 22.1 million hectares. On the other hand, all types of KSA/KPA where the majority of the area is located in the sea are classified as marine KSA/KPA (KSA/KPA perairan) and cover a total of 5.3 million hectares³. As consequences, there are terrestrial and sea waters which are included in terrestrial KSA/KPA. Notably, approximately 200 thousand hectares of terrestrial and sea waters in Aceh Province are classified as terrestrial KSA/KPA, because the majority of the area of KSA/KPA in Aceh is comprised of land. On the other hand, marine KSA/KPA have islands with forests that are classified as marine KSA/KPA, because the majority of the area in these marine KSA/KPA are sea waters. One of the most famous terrestrial KPAs in Indonesia is Komodo National Park, the home of the unique and rare Komodo

Dragon (*Varanus komodoensis*), and a UNESCO world heritage site. World famous Indonesian marine conservation areas include Bunaken National Park, Wakatobi National Park, and Raja Ampat Marine Protected Area.

Indonesia employs a different definition of "forest" than is used in some other parts of the world. This publication uses the definition provided in Indonesian law. The Indonesian definition has been recognized by the UNFCCC through its approval of Indonesia's National Forest Reference Emission Level (FREL) for Deforestation and Forest Degradation⁴ (See Box 2.1). Under Indonesian law, the area legally designated as "Forest Area" (*Kawasan Hutan*) is under the jurisdiction of the Ministry of Environment and Forestry. The Forest Area has areas that are both covered by forest or "forested" (*berhutan*) and not covered by forest or "not forested" (*tidak berhutan*). Similarly, public lands that are categorized under Indonesian law as "Other Use Areas" (*Areal Penggunaan Lain*, APL) can be both "forested" or "not forested". The full extent of Indonesia's forest is usually referred to as the "forested area" (*areal berhutan*) or "forest cover area" (*luas tutupan hutan*), a term that encompasses both the Forest Area and APL.

On land designated as Forest Area and APL, land cover may take several different forms, including natural forests (consisting of primary forest and secondary forest), plantation forest, plantation/estate crops, agriculture, shrub, settlements, and various others. There are 23 land cover categories in Indonesia (see Appendix 2) and these are used for forest and forest resource monitoring. Based on a reassessment of land cover conducted in 2019 using image interpretations derived from the Landsat Data Continuity Mission (LDCM)/Landsat 8 OLI for 2019 coverage, 79.6 percent of Indonesia's conservation forest area; 81.0 percent of its protection forest area; and 80.0 percent of its limited production forest area are

³ See Chapter 5 for more detailed information on Conservation Areas.

⁴ MoEF, 2016a.

covered by forest. In permanent production forest areas, the forest cover is 61.0 percent, while in convertible production forest areas, the figure is 49.1 percent. Another form of forest is planted forest, land cover with trees developed by humans that fulfill the definition of forest, either Industrial Plantation Forests or reforestation and greening activities within

and outside the Forest Area. The remaining land cover types found in all the Forest Area are estate crops, agriculture, shrub, settlements, etc. which are classified as non-forested areas or areas without forest cover. Table 2.1 quantifies forest cover in and outside the Forest Area.

► TABLE 2.1 Extent of land cover types in Forest Area and Non-Forest Area in Indonesia (2019)

Land cover	Forest Area* (in millions of hectares)							Non-Forest Area (APL)	Grand Total	%
	Permanent Forest					HPK	Total			
	HK	HL	HPT	HP	Total					
	(1)	(2)	(3)	(4)	(5=1+2+3+4)	(6)	(7=5+6)	(8)	(9=7+8)	(10) ^e
A. Forested	17.4	24.0	21.4	17.8	80.6	6.3	86.9	7.2	94.1	50.1
- Primary forest	12.5	15.9	9.8	4.7	42.7	2.5	45.3	1.5	46.8	24.9
- Secondary forest	4.8	7.8	11.3	9.7	33.6	3.7	37.3	4.9	42.2	22.5
- Plantation forest ^b	0.1	0.3	0.4	3.5	4.3	0.0 ^c	4.3	0.8	5.1	2.7
B. Non-forested	4.5	5.6	5.4	11.4	26.8	6.5	33.4	60.3	93.6	49.9
Total Terrestrial Area	21.9 ^d	29.6	26.8	29.2	107.4	12.8	120.3	67.5	187.8	100.0
% Forested Area^e	79.6	81.0	80.0	61.0	75.0	49.1	72.2	10.7	50.1	

Notes: HK - Conservation Forest; HL - Protection Forest; HPT - Limited Production Forest; HP - Permanent Production Forest; HPK - Convertible Production Forest; APL - Other Use Area/Non-Forest Area.

* Definition of forest area is presented in Footnote No. 1. See also Box 2.1.

^a Percentages are calculated by dividing each row's Grand Total (column 9) by Indonesia's Total Terrestrial Area (187.8 million hectares).

^b Plantation forest is a forest cover class developed by humans (man-made), and includes all types of planted forests, both Industrial Plantation Forest/IUPHHK-HT and planted forest from reforestation/regreening within or outside the Forest Area. It is determined based on image interpretation, and appears as a neat pattern on flat areas, in contrast to surrounding areas with different colors on non-flat/wavy topographies.

^c The actual figure is 42.1 thousand hectares.

^d This figure refers to total terrestrial (land) area of the terrestrial KSA/KPA (KSA/KPA *darat*) area.

^e Percentages are calculated by dividing each row's forested total (row A) by the Total Terrestrial Area in the same column.

SOURCE: KLHK, 2020a.

BOX 2.1

Forest Definitions in the Indonesian Context

The Global Forest Resource Assessment of the Food and Agriculture Organization defines a forest as an area of land of more than 0.5 hectares with tree canopy cover of more than 10 percent and trees higher than 5 meters at maturity (GFRA FAO, 2010).

While the GFRA FAO's definition of a forest as having 10 percent canopy cover works well in a global context, in Indonesia's natural tropical forest ecosystem, an area of land with 10 percent canopy cover more accurately be described as non-forested. For this reason, under Indonesian law, a forest is defined as a "unified ecosystem in a landscape dominated by tree communities, found in the natural world" (National Forestry Law 41/1999). A follow-on Decree of the Minister of Forestry of Indonesia, No. 14/2004 defines a forest as an area of "land spanning more than 0.25 hectares, with trees higher than 5 meters at maturity and a canopy cover of more than 30 percent, or trees able to reach these thresholds in situ" (MoFor, 2004).

The Decree of the Minister of Forestry of Indonesia, No. 14/2004 was incorporated in a further-modified form into an Indonesia-specific UNFCCC "working definition" of forests, for purposes of the carrying out of the Clean Development Mechanism (CDM) and has now been enshrined in Indonesia's National Forest Reference Emissions Level (FREL). This "working definition" defines a forest as **"a land area of more than 6.25 hectares with trees higher than 5 meters at maturity and a canopy cover of more than 30 percent."** The decision to expand to 6.25 hectares the minimum area of land for a forest under the "working definition" was driven by considerations of measurement and visual interpretation: 6.25 hectares is the smallest area that can be measured by satellite, plotted in a 0.25 cm square polygon, and mapped at a scale of 1:50,000. The State of Indonesia's Forests 2020 adheres to this same "working definition" of a forest.

SOURCE: [MoEF]. 2016a. *National Forest Reference Emission Level for Deforestation and Forest Degradation: In the Context of Decision 1/CP.16 para 70 UNFCCC (Encourages developing country Parties to contribute to mitigation actions in the forest sector): Post Technical Assessment by UNFCCC. Directorate General of Climate Change. The Ministry of Environment and Forestry, Indonesia.*

2.2 Biodiversity Potential

Indonesia is a tropical country located between two continents, Asia and Australia, and between two oceans, the Pacific Ocean and the Indian Ocean. In bio-geographical terms, Indonesia's biodiversity is explained by the fact that the nation is transected by the Wallace Line, the Weber Line, and the Lydekker Line, all three of which mark (in different places) the division between the Asian and Australian regions. As a result, Indonesia's flora and fauna fall into two major types, with the two types reflecting similarities in the respective regions. Because of its geographical location, Indonesia has an extremely high level of biodiversity⁵ and endemism. Indonesia's biodiversity is greater than any other country

in the world except Brazil and Colombia.⁶ Indonesia contains 13 land-based ecosystems and six aquatic ecosystems (including both freshwater and marine ecosystems). Within these 19 ecosystems, there are 74 systems of vegetation types.⁷

As explained in the Indonesian Biodiversity Strategy and Action Plan (IBSAP) 2015-2020, the nation is blessed with 1,605 recorded bird species; 723 reptile species; 385 amphibian species; 720 mammal species; 1,248 freshwater fish species; 197,964 invertebrate species; 5,137 arthropod (spider) species; 151,847 insect species including 30,000 from the hymenoptera order (wasps, bees and ants). In terms of plant life, there are 91,251 species of spore-based plants. Of

plants that produce seeds (spermatophytes), there are 120 species of vascular plants that produce exposed seeds (gymnosperms) and an estimated 30,000 to 40,000 species of flowering plants (angiosperms), of which only 19,112 species have been identified so far.⁸

Indonesia's wildlife includes the Sumatran tiger (*Panthera tigris sumatrae*), the Sumatran elephant (*Elephas maximus sumatrensis*), the Sumatran rhinoceros (*Dicerorhinus sumatrensis*), the Javan rhinoceros (*Rhinoceros sondaicus*), the Kalimantan orangutan (*Pongo pygmaeus*), the Sumatran orangutan (*Pongo abelii*), Anoa (*Bubalus quarlesi*) in Sulawesi, the Komodo dragon (*Varanus komodoensis*) in East Nusa Tenggara and the bird of paradise (*Paradisaea apoda*) in Papua. Not only is this fauna emblematic of Indonesia's biodiversity, but these different species are greatly loved in Indonesia, and globally.

functions as basic reference in the monitoring and evaluation process and as a reference for general public to participate in the implementation of national development.

In the RPJMN for 2020-2024, four mainstreaming are determined in order to achieve innovative and adaptive development, and in order to catalyze development so Indonesia becomes a more prosperous and equitable nation. The four mainstreaming being sought are: the Sustainable Development Goals (SDGs) including 17 Goals and 118 Targets; Gender; the development of Social and Cultural Capital; and Digital Transformation. These four areas of mainstreaming underlie sectoral and regional development, and implicitly take into account environmental sustainability and inclusive implementation. They also aim to provide equitable and equal access to development by improving the efficiency of governance and adaptability to external environmental factors.

The President's five directives for RPJMN 2020-2024 are human resource development, infrastructure development, regulations simplification, bureaucracy simplification, and economic transformation. These directives are then translated into a seven-part Development Agenda/National Program (*Program Nasional*, PN), notably: (1) Strengthening economic resilience for quality and equitable growth, (2) Developing regions to reduce inequality and ensure equal distribution, (3) Improving the quality and competitiveness of human resources, (4) Mental revolution and cultural development, (5) Strengthening infrastructure to support economic and basic services development, (6) Environmental development and enhancing resilience toward disaster and climate change, and (7) Strengthening stability in political, legal, defense and security affairs, and transformation of public services.

In this regard, The Ministry of Environment and Forestry directly contributes to PN 1, PN 2, PN 3, and PN 6, and under these is assigned

⁵ Biodiversity can be grouped into three main types: ecosystems, species, and genetic diversity.

⁶ Butler, 2016.

⁷ Kartawinata (2013) in IBSAP 2015-2020.

2.3 Forestry and the Management of Forests in Indonesia

The Indonesia National Medium-Term Development Plan (*Rencana Pembangunan Jangka Menengah Nasional*, RPJMN) 2020-2024 aims to achieve a prosperous, equitable, and sustainable Indonesia with middle-high income, through accelerating development, by emphasizing the establishment of a solid economic structure based on competitive advantages in various regions, supported by qualified and competitive human resources. The RPJMN document provides the main guidelines for ministries/institutions in formulating their medium-term Strategic Plans (*Rencana Strategis* or Renstra), Annual Government Work Plans (*Rencana Kerja Pemerintah*, RKP), and for Local Governments in formulating their Regional Medium-Term Development Plan (*Rencana Pembangunan Jangka Menengah Daerah*, RPJMD). It also

⁸ IBSAP 2015-2020 (KemenPPN/BAPPENAS, 2016).



Panther Flying Frog (*Rhacophorus pardalis*): A species with Least Concern (LC) status in the IUCN Red List of Endangered Species.

LOCATION:
Kerinci Seblat National Park, Jambi

PHOTO BY:
Asep Ayat (2011)

to eight Priority Programs (PP), as follows:

- PN 1 - PP 2 Increasing quantity/availability of water to support economic growth
- PN 2 - PP 6 Increasing value-added, employment, and investment in the real sector, and industrialization
- PN 2 - PP 1-7 Developing regions to reduce inequality and ensure equal distribution
- PN 3 - PP 6 Alleviating poverty
- PN 3 - PP 7 Increasing productivity and competitiveness
- PN 6 - PP 1 Improving the quality of the environment
- PN 6 - PP 2 Increasing disaster and climate resilience
- PN 6 - PP 3 Low carbon development

These National Programs and their associated Priority Programs provide the Ministry of Environment and Forestry with a mandate for the achievement of targets directly related to the management and conservation of forest and forest resources, and also environmental management. Progress from 2015 to 2019, which lays the groundwork for achieving RPJMN 2020-2024, is described in sections 2.3.1 to 2.3.8 below.

2.3.1 Governance of Forest Areas

The government has submitted two bills to the House of Representatives (DPR), namely the Job Creation Omnibus Law bill and the Tax Omnibus Law bill. The Government and the House of Representatives have stipulated the two Omnibus Law bills to be included in the priority national legislation program for 2020. In October, the Job Creation Omnibus Law was passed by the DPR and signed into force by the President. There are at least three benefits that will occur from the passage of these two Omnibus Laws, namely (1) eliminating overlaps between various laws and regulations, (2) efficient and necessary changes to /revocation of

certain laws, (3) eliminating the sectoral egotism that underlies some of the laws and regulations that will be changed.

The substance of the Job Creation Omnibus Law has been discussed intensively within relevant ministries/institutions and covers: simplification of licensing; investment requirements; employment; ease of creation, empowerment and protection of small and medium businesses; ease of doing business; research and innovation support; government administration; imposition of sanctions; land acquisition; government investment and projects; and the economy.

Land cover in forest areas, particularly forest cover, is dynamic and subject to rapid change, with both the condition and the extent of forest cover declining. Several factors contribute, including: the conversion of forest areas for use by other sectors; unsustainable management of forests; illegal logging; mining activities; encroachment; and forest fires. Failures to optimize reforestation and greening activities have also contributed to an increase in the extent of severely degraded land.

To address worsening forest conditions and disappearing forest cover, better systems of forest governance are required, including: monitoring of forest resources; using environment and forestry thematic geospatial information for a national One Map; and legal certainty of forest areas.

Other aspects of good governance to improve forest quality in Indonesia are:

- (1) Voice and no violence: Listening to people's aspirations to receive forest-based economic, social and environmental benefits. The government's policy of pro-people forests is further enhanced by its focus on economic equity to reduce conflicts, the creation of jobs through social forestry programs so that people

have access to state forests legally and in undamaging ways through the development of ecotourism and agroforestry. December 2016 was the government's first official recognition of the existence of *Adat* forest community groups, with nine such groups being recognized in the first instance.

- (2) Rule of law: Law enforcement and restoring popular sovereignty are priority targets of the government. Some notable examples are: efforts to improve forest cover and quality by issuing peat protection regulations; a moratorium on the issuance of new resource use permits in an area of forest covering one third of the nation; sanctions which include the revocation of licenses, suspension of licenses, written warnings for forest destroyers, and forcible attempts to enforce the law and impose penalties on forest destroyers. With the issuance of Presidential Instruction No. 7 of 2019 concerning the acceleration of ease of doing business, all licensing matters are managed by the Indonesian Investment Coordinating Board (BKPM).
- (3) Quality of regulation: Significantly increasing the area of sustainably managed forests while not unduly burdening the private sector.
- (4) Effective government: The Government continues to make efforts to prevent forest degradation and to contribute to global efforts to address climate change. Of paramount importance is better management of protection forests, production forests and conservation forests. A steady "state presence" in the field is the key to following up on effective government policies.
- (5) No corruption: Effective fund mobilization will foster sustainable forest management and strengthen scientific and technical cooperation and partnerships. Conversely, poor

forest management will provide space for corruption to thrive due to weaknesses in planning, implementation and field surveillance. The Minister of Environment and Forestry has established the rule of law in its internal institutions to eradicate corruption, and is now implementing charter audits in the Ministry's offices, erecting efficient internal controls, and soliciting and receiving public complaints.

2.3.2 The Forestry Sector's Role in Climate Change Adaptation and Mitigation

Climate change represents a significant global challenge, with climate change having the potential to drastically impact human life around the globe. Climate change is now a major recognized issue at the local, national, regional, and international levels, with increasing recognition that climate change has the potential to have a particularly severe impact on certain nations, including nations in tropical zones such as Indonesia. As stated previously, Indonesia has one of the highest levels of biodiversity in the world. However, its natural resources and its environment are facing severe disturbance due to human activities (anthropogenic factors) in several sectors, all of which may contribute directly or indirectly to global warming. Indonesia is also facing significant challenges in air pollution and the uncontrolled exploitation of forest and mineral resources, with these activities threatening access to water, and exacerbating forest fires (during El Nino) and landslides and floods (during El Nina). Indonesia also contributes significantly to greenhouse gas emissions. At the same time, with its large number of big and small islands, many of which are low in elevation, Indonesia is particularly vulnerable to the impact of climate change, including

through factors such as rising sea levels, the increased duration of dry seasons, and extreme weather incidents that may result in floods, landslides, and other disasters. This high level of vulnerability has the potential to negatively impact economic, food and energy security throughout the nation. Thus, a comprehensive and integrated approach to the management of climate change is required.⁹

To control and manage the complex range of factors that contribute to climate change, policies and programs that integrate the involvement of multiple sectors have been implemented. The Indonesian Government demonstrated its commitment to international agreements on climate change with the enactment Act No. 6 of 1994 on the UNFCCC (United Nations Framework Convention on Climate Change) as well as Act No. 32 of 2009 on Environmental Protection and Management.

In 2015, when global negotiations on climate change reached their culmination, Indonesia ratified the Paris Agreement at the COP 21 of UNFCCC in Paris, and incorporated that commitment into national law with Act No. 16 of 2016 on the Ratification of the Paris Agreement to the United Nations Framework Convention on Climate Change. The Paris Agreement sets the goal of limiting global warming to well below 2°C while pursuing efforts to limit the increase to 1.5°C. The commitment to reducing emissions from greenhouse gases has since been reaffirmed in Indonesia's Nationally Determined Contribution (NDC), whereby Indonesia's agreed 2030 targets for reducing emissions -- compared to business as usual -- are 29 percent through its sole efforts, and up to 41 percent depending on levels of international cooperation, with reductions being made in the forestry, energy, waste,

industrial processes and product use (IPPU), and agriculture sectors.

Improvements in the effectiveness of both climate change mitigation and adaptation measures are being sought. With particular respect to adaptation, potential measures have been identified and adopted in the 1st NDC and will be included as well in the Updated NDC. The role of a National Focal Point (NFP) will become more prominent. Reductions in the area of forest and land affected by fire and an increase in the number of areas with the capacities to implement adaptation measures are being targeted. Therefore, certain key programs on the forestry sector have been identified, among others:

- Economic resilience: integrated watershed management, reduction of deforestation and forest degradation, land conservation, and utilization of degraded land for renewable energy;
- Social and livelihood resilience: development of community capacity and participation in local planning processes to secure access to key natural resources, identification of highly vulnerable areas in local spatial and land use planning efforts, and conflict prevention and resolution;
- Ecosystem and landscape resilience: social forestry; coastal zone protection, and ecosystem conservation and restoration.



Field visit to peatlands restoration area prior to the International Tropical Peatlands Center soft-launching

LOCATION
PT Mayangkara Tanaman Industri,
West Kalimantan

PHOTO BY
Ricky Martin/CIFOR (2018)

The Government of Indonesia places high strategic priority on its participation in international negotiations to ensure that policies adopted result in real impacts in Indonesia, the implementation of NDC mitigation measures, and the development of systems to calculate emissions of greenhouse gases at both the national and provincial levels. In the current NDC now being updated, the goal of achieving reductions in greenhouse gas emissions is at the forefront. Indonesia is also preparing to implement the Katowice Package, as part of Indonesia's UNFCCC commitment. The Katowice Package sets out the essential procedures and mechanisms that will make the Paris Agreement operational. Finally, Indonesia is developing a Vision 2050 on Climate Change.

⁹ KLHK, 2015a.

2.3.3 Management of the Peat Ecosystem

Indonesia's Forest Area has approximately 15 million hectares of peatlands, which amounts to 12 percent of the nation's total area, spread primarily across the islands of Sumatra, Kalimantan and Papua. This is the largest tropical peatland in the world, followed by the Democratic Republic of Congo whose peatland amounts to 9 million hectares, and the Republic of Congo with 5.5 million hectares.¹⁰ Indonesia's entire Peat Hydrological Unit (*Kesatuan Hidrologis Gambut*, KHG) covers a total area of 24.7 million hectares, of which 9.6 million hectares are located in Sumatra; 8.4 million hectares in Kalimantan; 6.6 million hectares in Papua; and 0.06 million hectares in Sulawesi.

Peat ecosystems¹¹ are defined by number of unique characteristics, including a high capacity to retain water. Thus, peat ecosystem serves as hydrological buffer zones for surrounding areas. In addition, peat ecosystems store a high level of carbon, thereby having the potential to absorb high levels of greenhouse gases from the atmosphere. However, peatlands are also particularly vulnerable to damage if they are not managed appropriately. This damage may take the form of land subsidence, or fires if peat forests are cleared and dried (peat drainage) through the diversion of water through canals (peat canalization).

Despite the promulgation of a number of regulations since 1990, peat drainage is still often conducted as a means of preparing land for agricultural uses. This results in peat drying out, increasing the potential for fires. Fires on peatlands have

the potential to create natural disasters that have a local, national, and even regional impacts, with haze from these fires often affecting neighboring countries. With their contribution to carbon dioxide emissions, they also have a global impact.

Government Regulation 71 of 2014 and Government Regulation 57 of 2016 regarding Peat Ecosystem Protection and Management, which were then followed by four implementing Regulations issued by the Minister of Environment and Forestry, contain procedures for inventorying peat ecosystem functions, measuring groundwater levels, guiding restoration of peat ecosystems, and adjusting the trajectory of development of Industrial Plantation Forests and oil palm plantations toward better management of peat in Indonesia. The government regulations reinforce protective measures for peat ecosystems and restrict anyone, including communities and companies, from opening new peatlands in a manner that undermines their protected ecosystem functions. The ban includes a prohibition of drainage channels resulting in dry peat, burning of peatlands, and/or other activities that result in the destruction of peat ecosystems. In line with that, law enforcement in relation to peatland management is being continuously applied on the ground.

Among the Minister of Environment and Forestry's four implementing regulations related to peat, Regulation 40 of 2017 regarding Government Facilitation on Industrial Plantation Forests is intended to protect and manage the peat ecosystem. For those Industrial Plantation Forests (HTI) located in the peat ecosystem that do not perform well, licenses may be revoked, or adjustments may be made in order to protect peat ecosystem protection functions (*Fungsi Lindung Ekosistem Gambut* or FLEG). Currently, there are 99 Industrial Plantation Forests (IUPHHK-HT), one

natural forest timber concession (IUPHHK-HA), and nine ecosystem restoration units (IUPHHK-RE) located in peat ecosystems.

Efforts to restore peat ecosystems have demonstrated success in the field, including through the assignment of permanent status to some peat ecosystems by Indonesia's forest moratorium, and through law enforcement. One peat protection effort that involves grassroots communities is the "Peatland Village Awareness" program, an integrated peatland management model.

2.3.4 The role of the State, Community Participation and the Achievement of Economic Autonomy

Indonesia's forests form a vital national resource that must benefit the broader community, rather than merely benefiting individual or group interests. Thus, the use of forest resources must involve fair and equitable access to these resources through the full involvement of all elements of the community, therefore empowering all elements of the community and enabling them to achieve their full potential. The Government has established social forestry programs as a manifestation of its commitment to empowering communities to develop their capacities and to enable them to participate in the management of forests in a just, environmentally-friendly manner that facilitates the achievement of social and economic security and resilience to external threats. The government's social forestry priority programs include community empowerment activities, community entrepreneurship, building economic clusters and value chains, improving productivity, providing communities with opportunities, knowledge and skills, and preventing conflicts over natural resource management.

The Government has directed that 12.7 million hectares of forest land be allocated to communities through its social forestry programs, with this land being designated as Community Forests (*Hutan Kemasyarakatan*, HKm), Village Forests (*Hutan Desa*, HD), Community Plantation Forests (*Hutan Tanaman Rakyat*, HTR), *Adat* Forests (*Hutan Adat*), and Forestry Partnerships (*Kemitraan Kehutanan*). In order to develop these social forestry programs, communities have been provided with funds in the form of revolving loans to increase their access to capital and markets as a means of achieving economic autonomy. Strategic issues that affect social forestry include the actual provision of forest access to communities; strengthening the recognition process for *Adat* forests; and the management of tenurial conflicts.

In 2020-2024 the social forestry program will focus on strengthening community forest management, investment/business partnerships, industrial value-added products, and marketing/promotion support for social forestry products.

Addressing challenges to implementing the social forestry agenda, research and development have been conducted on:

- (1) Developing high quality seeds for various types of timber species and Non Timber Forest Products (NTFP), with an emphasis on the genetics and resilience of those seeds, including seeds for teak, mahogany, rust resistant *sengon*, *sungkai*, acacia, sandalwood and mulberry trees, and seeds for trees that support or produce silk worms, *kayuputih* (eucalyptus), *nyamplung*, agarwood, breadfruit, *keruing* oil, *kemenyan* perfume, sagoo, masoi, honey, and bio-ethanol.

¹⁰ Miles, et al., 2017.

¹¹ Peat is a naturally occurring organic material produced from imperfectly decomposed plant residues that accumulates in swamp land, with at least 50 centimeters of thickness.

- (2) Providing technical facilitation to Community Forest (HKM) and Forestry Partnership (*Kemitraan Kehutanan*),
- (3) Science and technology pilot projects on the cultivation of timber trees, NTFP and agroforestry,
- (4) Community capacity building,
- (5) Innovation in silk worm production

2.3.5 Protection Forests, Natural Resource and Ecosystem Conservation

Protection forests play a major strategic role in protecting environmental life-support systems by regulating water supplies; preventing floods; controlling erosion; preventing sea water intrusion; maintaining soil fertility; providing adequate food and energy supplies for human life; and maintaining germplasm (living genetic resources such as seeds or tissues that are maintained for the purpose of animal and plant breeding, preservation, and research uses). In recognition of this vital role, the management of Protection Forests by dedicated Protection Forest Management Units (*Kesatuan Pengelolaan Hutan Lindung*, KPHL) is required at the ground level. At an operational level, the management of protection forests involves issues related to governance; protection; and rehabilitation. All these activities are now being conducted by a growing number of KPHL in cooperation with community stakeholders, with an emphasis on non-timber forest products and the provision of environmental services for community prosperity.

With Indonesia's high level of biodiversity, appropriate management is required to ensure that all elements of the community benefit from these resources. Appropriate management of these resources requires attention to

three aspects, these being conservation, sustainable use, and the equitable distribution of benefits from the utilization of these resources. Conservation areas represent the final fortress for biodiversity protection. The Government's goal is to ensure that conservation areas and the biodiversity therein are managed, protected and utilized sustainably to increase the economic and social welfare of all elements of the community and to maintain the quality of human life in Indonesia. Best practices in biodiversity conservation include protecting animal habitats and wildlife corridors. New species have recently been found in protection and conservation forests including the Orangutan Tapanuli (*Pongo tapanuliensis*), one of only eight (including humans) species of Great Ape found on the planet found at KPHL Batang Toru in North Sumatra Province. Ecotourism in Indonesia's protection and conservation forests is a potentially vast, but virtually untapped market. *Adat* communities are natural partners for conservation and protection forest collaborative management programs. The Government is implementing programs to: increase revenues and non-tax revenues from the use of biodiversity and environmental services in conservation areas; increase the effectiveness of conservation management; monitor efforts to maintain biodiversity.

In 2020-2024 the government will focus on strengthening the functioning of conservation areas, including conducting an inventory of high-value environmental services, protection efforts, and participatory protection of national conservation areas.

2.3.6 Sustainable Production Forest and the Economic Contribution of Forestry

For more than four decades, forest resources have played a significant role in facilitating Indonesia's economic development. Since 1967, forests have played an important role in the production of timber. However, the performance of forest management in Indonesia and the standing stock of commercially valuable timber have declined. In earlier periods, from the first establishment of Indonesia's forestry sector until the 1990s, the forestry sector made a significant contribution to national development. However, this contribution has declined since the advent of the reform era, with the associated implementation of regional autonomy policies. This condition was shown by a significant decline in the level of productivity of production forest and an increase in the level of forest degradation. In 2014, 14.06 million hectares of severely degraded lands were identified inside the Forest Area and also Non-Forest Area.

The implementation of regional autonomy gave authority to district government to grant permits for managing the felling of timber within the Forest Area (an authority which has since been rescinded), and the conversion of parts of the Forest Area into estate crops (an authority which still rests with district governments). The latter remains difficult for the central government to control. The euphoria of reform and autonomy, and the momentum of freedom for society and regional governments, has also resulted in environmental damage. If forestry practices continue unchanged, there is a significant risk to the existence of the production forest. Conventional forestry practices that are conducted solely to extract the maximum possible amount of timber must be revised, with the introduction of innovative approaches to producing goods and services.

The government has taken serious steps to facilitate the emergence of a new environmental services sector. Regulations have been issued, such as for tourism services in the forest (2013), micro hydropower (2014), the utilization of conservation areas (2014 and 2015), geothermal power (2015), utilization of nature tourism environmental services in Production Forest as well as social forestry businesses (2016) and non-timber forest products (2017).

Improvements to Production Forest governance are also being implemented to address this situation. In particular, implementation of appropriate spatial planning processes, actions to resolve conflicts, efforts to curb illegal logging, encroachment, forest fires and overlapping use of areas, heightened monitoring, and improved standards for the sustainable management of forests (KLHK, 2020c). Through these measures, the quality of forest cover in production forests may be improved, the contribution of production forests (and wood-based industries) to the economy and to state revenues may be increased, and the sustainability of Production Forest management in the field may be enhanced. The Government has already begun to implement a number of measures to improve these issues, including: systems for the certification of forests and chains of custody to ensure the legality of timber (SVLK and SIPUHH-online); the establishment of production forest management units (KPHP); as well as an internet-based system to facilitate Non-Tax State Revenue (PNBP) payment and improvements to information transparency (*Sistem Informasi Penerimaan Negara Bukan Pajak Online*, SIPNBP).

As for social forestry, by May 2020 the provision of access to forests for local communities had reached a total area of 4,147,875.30 hectares nationwide for various social forestry schemes. Social

forestry practitioners were among the recipients of community business credits (*Kredit Usaha Rakyat*). Access to lands for local communities has driven the domestic economic sector, by increasing labor absorption and the contribution of social forestry programs to the National and Sub-National GDP.

2.3.7 SDG 12 Sustainable Consumption and Production in Indonesia: Systemic Change for Driving Sustainable Development and Green Growth

The Rio Declaration for Environment and Development at the 1992 Earth Summit determined that sustainable consumption and production (SCP) would be Goal 12 of the Sustainable Development Goals (SDGs). In 2013 the Ministry of Environment and Forestry, together with other ministries and the Indonesian Chamber of Commerce and Industry, published the 10-Year Framework of the National SCP Program. In 2020, the Ministry of Environment and Forestry and the Ministry of National Development Planning updated and incorporated Indonesia's 10 year SCP into the Framework for Indonesia's SCP for 2020 to 2030. SCP themes include climate change, resource efficiency, water, and food.

The alignment of SCP instruments with various policies, programs, and initiatives are as follows:

- Supply Side - SCP Action: Forest landscape ecosystem management implemented by intensive silviculture (including sustainable forest production management, and legality verification), green bonds financing, and REDD+, supported by RIL green technology, sustainable tourism, and green industry.

- Demand Side - SCP Action: The Ministry of Environment and Forestry responds to the demand for seed and seedling certification, and environmentally friendly forest products, including to support the food system.
- Green Market - SCP Action: The government commits to implementing result-based payment on forest carbon for sustainable forest management.
- Community of Practice - SCP Action: The Ministry of Environment and Forestry implements the Agrarian Reform/TORA program, supports the community in accessing lands, forests, *adat*, natural-based tourism, and community-based forest management.

Indonesia's forests are needed to protect domestic and global food sources, supply global timber markets, and provide emissions reduction credits to carbon markets. The nation's forests also provide environmental services, agroforestry jobs, and may power potential new niche markets arising from paludiculture (the practice of cultivating sustainable products in swamp forests). To ensure that all of these benefits are maintained, pollution control, eco-labels, consumer information, education, communities of practice, and professional environmental service providers working at a high standard will all be required.

2.3.8 Environmental Governance in Forest Management

The Indonesian Government sees the importance of environmental governance to manage the forest sustainably through the implementation of appropriate rules, practices, and policies.

Environmental Outlook and Science for Decision-Making: The Indonesian Government communicates forestry programs and achievements, including through the first State of Indonesia's Forests (SOIFO) document launched at the 24th Session of the FAO Committee on Forestry forum in 2018, submitted the 6th National Report to the Secretariat of the Convention on Biological Diversity (SCBD) in 2019 to report Indonesia's achievement toward the Aichi Biodiversity Targets, and organized the 7th Indonesia-EU Joint Implementation SVLK Committee in 2019. The Government is also actively implementing agendas on reducing climate change impacts. The Environmental Fund Management Agency has just recently been established to mobilize environmental funds and has adopted international standards on fund management. There are other tools created, such as a cyber patrol in social media, e-commerce platforms to unveil illegal wildlife trade and illegal activities, and an android Automatic Wood Identification System (AIKO) to support law enforcement.

National Policy Setting: The Ministry of Environment and Forestry has established the rule of law to eradicate corruption, implements charter audits in Ministry offices for efficient internal controls, and solicits and receives public complaints. The Ministry also engages and involves stakeholders to protect the forests from fires in peatlands and conservation areas, manages Non-Timber Forest Products (NTFP), sets up provisions for environmental services utilization for

community prosperity, and guarantees the legality of Indonesia's timber.

Development Planning: The Indonesian Government has an active role in implementing agendas on the ASEAN Agreement on Transboundary Haze Pollution by its strong commitment to host the ASEAN Coordinating Centre for Transboundary Haze Pollution Control (ACC THPC). The Government has also developed National Action Programme of Land Degradation Neutrality (NAP-LDN), an action program which aims at maintaining forest areas by integrating investment and local expertise in order to alleviate existing poverty. This is in line with efforts to strengthen the country's economic resilience, reduce income inequality, promote human resources capacity, and fulfill all related SDG targets.

International Concerns and Stakeholder Engagement: The Indonesian Government issued a moratorium on the issuance of new resource use permits in the natural forest and peatlands and strengthening law enforcement against forest destroyers. The 'Updated NDC' process is on-going and aimed at producing a concise narrative, flexible, but accountable. The process is being facilitated by the Ministry of Environment and Forestry with input from experts and stakeholders.



**The View of
Peat Ecosystem
Restoration Area**

LOCATION
Semenanjung Kampar, Riau

PHOTO BY
Restorasi Ekosistem Riau (2016)

CHAPTER 3

Addressing Deforestation and Forest Degradation

3.1 Causes of Deforestation and Forest Degradation

Deforestation and forest degradation are of major concern to many developing countries, including Indonesia. Sometimes desired, but mostly undesired, deforestation carries both positive and negative impacts¹². Deforestation may be considered desirable when it results in a financial gain. On the other hand, the environmental and social costs of deforestation can and often do exceed such short-term financial gains.

Indonesia has experienced deforestation in both a positive and negative manner. Deforestation was positive because it provided income to the country during the lean years in the aftermath of independence. From 1966 until the late 1980s, Indonesia was the world's biggest raw log exporter and then the world's largest plywood producer. Timber was the second biggest contributor to the Indonesian economy after oil and gas, during the years immediately following the decrease in the price of oil in 1982¹³. Only starting in 1980s, did a preponderance of researchers begin to pay attention to the loss of forests in developing countries, including Indonesia, and begin to understand that deforestation has negative implications for forest resources as well as human well-being. Vast amounts of research have been undertaken to identify the causes of deforestation and forest



A portrait of ex-deforested patch of land showing emergent of pioneer plants.

LOCATION
Gunung Mas District, Central Kalimantan

PHOTO BY
Iid Itsna Adkhi (2018)

degradation in developing countries, and debates and discourses continue on the definition of forests, of deforestation, and of forest degradation.

The Indonesian Government has been publishing deforestation figures from 2006, and currently publishes them annually¹⁴. Some of the activities identified as causes of deforestation include intensification in the felling of natural forests in timber concessions; the conversion of forest areas for use by other sectors, for example agricultural expansion (estate crops), mining activities, plantations and transmigration; unsustainable forest management; illegal logging; encroachment and illegal land occupation in forest areas; and forest fires. Evidence of these activities causing deforestation in Indonesia has been sought

after and discussed by numerous scientists and researchers¹⁵. These researchers have even differentiated between direct, immediate, proximate and primary causes vs. indirect, underlying, and secondary causes of deforestation and forest degradation. Other causes include infrastructure development, demand for timber exports, population growth and density, urbanization and urban expansion, commodity prices (for timber, oil palm, coal, bauxite, and nickel), Indonesia's geographic accessibility to markets, poverty, land tenure security and conflict, and wages and off-farm employment.

¹² Contreras-Hermosilla, 2000.

¹³ Siscawati, 1998; Sunderlin and Resosudarmo, 1996.

¹⁴ Dephut, 2008; Kemhut, 2011, 2012, 2013; KLHK, 2014, 2015, 2017a, 2017b, 2018a, 2020a.

¹⁵ Angelsen and Ainembabazi, 2014; Angelsen and Kaimowitz, 1999; Geist and Lambin, 2002; Hosonuma, et al., 2012; Kaimowitz and Angelsen, 1998; Kim, et al., 2016; Kissinger, Herold, and De Sy, 2012; Margono, et al., 2012; Prasetyo, et al., 2008; Purnamasari, 2010; Romijn, et al., 2013; Verburg, Veldkamp and Bouma, 1999; Verolme, et al., 1999; Wicke, et al., 2008; Zikri, 2009; etc.

While many of the phenomena discussed above are accepted as causes of both deforestation and forest degradation, questions remain as to whether forest and land fires are causes of deforestation, or only forest degradation. Siscawati (1998) concluded that excessive forest fire is a direct cause of deforestation and forest degradation in Indonesia, but evidence also suggests forest fires resulted from deforestation and forest degradation. Though it was difficult for Wicke, *et al.* (2008) to determine the exact amount of land that is affected by fires, they concluded that forest fires as a direct cause of forest cover loss is not in question. Similar to Wicke, *et al.* (2008), other studies by Contreras-Hermosilia (2000) and Margono, *et al.* (2012) mentioned that the recent (1997-1998) great fires in Indonesia's forests were dramatic drivers of forest loss. On the other hand, Hosonuma, *et al.* (2012) and Kissinger, Herold, and De Sy (2012) argue that uncontrolled fire tends to be more of a contributor to forest degradation, according to the FAO definition of forest degradation (FAO, 1998).

In order to address causes of deforestation and forest degradation, Indonesia has issued and implemented various policies. Results from the monitoring of forest resources are the building blocks for various data and information products (see Section 3.2). To reduce the extent of deforestation, the Indonesian Government has promulgated a range of policies, including a moratorium on the issuance of new concessions on areas of primary forests and peatlands since 2011¹⁶, provision of land for communities, resolving land use conflicts, and monitoring environmental permits and law enforcement (see Section 3.3 and 3.4). Indonesia also has committed to reducing greenhouse gas emissions and encouraging collaboration

¹⁶ Instruksi Presiden Republik Indonesia No. 10 Tahun 2011 tanggal 20 Mei 2011 tentang Penundaan Pemberian Izin Baru dan Penyempurnaan Tata Kelola Hutan Alam Primer dan Lahan Gambut. This regulation was applied in two-year intervals, which were renewed continuously, and then became a permanent moratorium in August 2019 with the issuance of Presidential Instruction No. 5 of 2019.

between communities, concession holders (IUPHHK) and Forest Management Units (FMU) to prevent forest and land fires through the establishment of fire brigades (see Section 3.5), better peat ecosystem management (see Section 3.7), forest landscape restoration (see Section 3.8), involving communities in forest and conservation area management through social forestry programs (see Chapters 4 and 5), and achieving Sustainable Forest Management (SFM) through mandatory forest and forest product certification (see Chapter 6).

3.2 Monitoring Forest Resources

To fulfill its mandate in the area of systems related to thematic geospatial information, the Ministry of Environment and Forestry has established an accurate, transparent and up-to-date National Forest Monitoring System (*Sistem Monitoring Hutan Nasional*, abbreviated as 'Simontana'). This system is also intended to support the implementation of Indonesia's Nationally Determined Contribution (NDC), and to help establish baselines for the national Forest Reference Emission Level (FREL). Simontana's main advantage is that it facilitates the availability of national land cover data developed since 1990. Simontana's role in monitoring deforestation is summarized in Box 3.1. Simontana can be accessed through a website located at webgis.menlhk.go.id.

The periodic monitoring of forest resources was conducted at three-year intervals in the period from 2000 to 2009. With advances in remote sensing technologies, since 2011, the monitoring of forest resources has been conducted on a yearly basis, with the process involving the preparation of land cover maps derived from the interpretation of medium resolution satellite images (Landsat 7 ETM+, Landsat 8 OLI) and high-resolution satellite images (SPOT-6, SPOT-7). The land cover map derived from this process in 2019 is presented in Figure 3.1.



A view of the lowland forest of Riau from the sky.

LOCATION
Riau

PHOTO BY
Asep Ayat (2005)

The results derived from the interpretation of land cover data are used to recalculate land cover and calculate deforestation rates. Land cover data is also used to prepare a Forest Resource Balance (*Neraca Sumber Daya Hutan*, NSDH), a Severely Degraded Land Map (*Peta Lahan Kritis*), an Indicative Map on the Permanent Moratorium for New Permit Issuance (*Peta Indikatif Penghentian Pemberian Izin Baru*, PIPPIB – also known as the Forest Moratorium Map), an Indicative Map of Social Forestry Areas (*Peta Indikatif Areal Perhutanan Sosial*, PIAPS), the map for the Identification of Land for Agrarian Reform (*Identifikasi Tanah Obyek Reforma Agraria*, TORA), a Strategic Environmental Assessment (*Kajian Lingkungan Hidup Strategis*, SEA), a Map of Potential Forest Resources (*Peta Potensi Hutan*), a map of Forest Reference Emission Levels (FREL) such as is shown in Appendix 3, and other products.

Increases or decreases to the level of deforestation are continuously monitored. For the purposes of this publication, the term deforestation refers to net deforestation (See Box 3.2).¹⁷ The extent of net deforestation can be calculated by determining the extent of *bruto* deforestation¹⁸ and subtracting the

¹⁷ Net deforestation refers to the change/reduction of forested land cover classes over a period of time that accounts for forest re-growth and forest plantations detected by satellite imagery over that same period of time.

¹⁸ *Bruto* deforestation refers to the change of land cover from forested to non-forested. It has a different meaning from "gross deforestation" which is limited to the loss of only natural forest cover, excluding the dynamic change (harvesting) of the man-made forest class. See further explanation on land cover classes in Section 2.1, Appendix 2, and Box 3.1.

extent of reforestation.¹⁹ This is expressed in the following equation:

$$\text{Extent of Net Deforestation} = \text{Extent of Bruto Deforestation} - \text{Extent of Reforestation.}$$

An increase in deforestation may result from dynamic changes to land cover as a result of human uses of land that cause losses of forest cover, while a decrease in deforestation may result from reforestation activities. Meanwhile, additions to the extent of forest cover may result from planting activities in plantation forest concession areas and/or from greening and reforestation activities²⁰ as well as natural regrowth.

Indonesia has calculated levels of deforestation periodically since 1990 (see Figure 3.2). The highest levels of deforestation rates were recorded in the period from 1996 to 2000, at 3.51 million hectares per year. In this period, major forest fires happened. In the subsequent period, from 2002 to 2014, the rate of deforestation declined, along with the decline in incidences of forest and land fires, together with the reining in of some of the excesses of decentralized forest management. From 2014 to 2015, annual deforestation within the Forest Area rose to 0.82 million hectares. Amongst the major drivers of deforestation were the forest fires of 2015.

¹⁹ Reforestation is forest and land rehabilitation in which the activity is carried out inside the Forest Area.

²⁰ KLHK, 2016a.

Land Cover Map of Indonesia



LEGEND

- National Capital
- Province Capital
- National Borders
- Province Borders
- Regency Borders

Coastline
River
Lake

Land Cover

- Primary Dryland Forest
- Secondary Dryland Forest
- Primary Swamp Forest
- Secondary Swamp Forest
- Primary Mangrove Forest
- Secondary Mangrove Forest
- Dry Shrub
- Wet Shrub Swampy Shrub

- Savanna
- Plantation Forest
- Estate Crop
- Dry Agriculture
- Mixed Dry Agriculture
- Transmigration Areas
- Paddy Field
- Fish Pond/Aquaculture

- Bare Ground/Bare Soil
- Mining Areas
- Port and Harbor
- Port and Harbor
- Open Water
- Open Swamp

Source:

- Satellite Landsat 8 Imagery OLI/TIRS July 2018 - June 2019
- Indonesian Topography Map Scal 1:250,000, Geospatial Information Agency 2018
- Administrative Boundary Map Scale 1:250,000, Geospatial Information Agency 2018

**DIRECTORATE OF FOREST RESOURCES INVENTORY AND MONITORING
DIRECTORATE GENERAL OF FORESTRY PLANNING AND ENVIRONMENTAL ADMINISTRATION
MINISTRY OF ENVIRONMENT AND FORESTRY
2020**

► FIGURE 3.1 Land Cover Map of Indonesia 2019

BOX 3.1 Monitoring of Deforestation

The Indonesian Government has established an independent system to monitor its forests at national scale, called *Sistem Monitoring Hutan Nasional* (Simontana) or the National Forest Monitoring System (NFMS). The system is a remote sensing-based monitoring system completed with terrestrial information. Simontana is maintained by the Ministry of Environment and Forestry. This system has been using land cover classification and definitions issued by national authorities, notably the Regulation of the Directorate General of Forestry Planology and Environmental Administration (No. P.1/VII-IPSDH/2015) and Indonesian National Standards SNI: 8033, 2014 and SNI:7645-1, 2010, 2014.

Simontana was initiated in 2000 with a remote sensing (Landsat) basis and focusing on forested and non-forested landscape classes. Forested classes include mature natural forests and man-made forests. Natural forests sub-classes include primary undisturbed forests (*Hutan Primer*), defined as forests with no signs of disturbance or logging, and secondary/disturbed forests (*Hutan Sekunder*), defined as all forests with signs of disturbance or logging (See also Land Cover Classification in Appendix 1).

Over its 20 years of development, which has included several name changes, Simontana has continued to improve and adjust to the newest remote sensing and information system technologies. Since 2009, NASA USGS has provided Simontana with open and free access to Landsat imagery, including in NASA USGS archives. As a result of a freely accessible Landsat data, and not having to only rely on data on country-based monitoring systems, there were many developments at a global scale in national forest monitoring systems using these newly-available NASA USGS data sets.

However, it is important to note that this global data focuses on global monitoring, which means that it includes all forests, and does not differentiate between tropical, boreal, and temperate forests, as well as other natural ecosystems such as savanna, and heath (*kerangas*) forests, etc.

With regard to this issue, there is a need to be careful in how various global data is used at the national scale and for national purposes, including for monitoring deforestation. Global data used for monitoring deforestation at the national scale needs to be equipped with clear definitions and references, so that descriptions match with, and references are calibrated against and are comparable to, monitoring that is being conducted nationally.

Understanding the terminology used within the country national system is important, as it may use for many purposes. The monitoring of deforestation in Indonesia through Simontana uses three key terminologies in relation to deforestation, and these must be referred to by anyone that conducts deforestation studies in relation to Indonesia:

- (1) Bruto deforestation is defined as the change in land cover classes from forested (natural and man-made forest) to non-forested;
- (2) Net deforestation is defined as the change/reduction of forested land cover classes (natural and man-made forest) over a period of time that accounts for forest re-growth and forest plantations detected by satellite imagery over that same period of time;
- (3) Gross deforestation is a loss of only natural forest cover, excluding the dynamic change (harvesting) of the man-made forest class.

Note that (1) and (2) are mainly used for in-country statistical reports, for purposes of forest resource management, including maintaining the dynamic change of man-made forest (forest re-growth and forest plantations), while (3) is used to only to monitor Indonesia's natural forest extent and dynamic. Note also that official reports submitted by the Indonesian Government to various international institutions and publications, including for REDD+, use the definition of gross deforestation, not bruto deforestation.

BOX 3.2 Deforestation

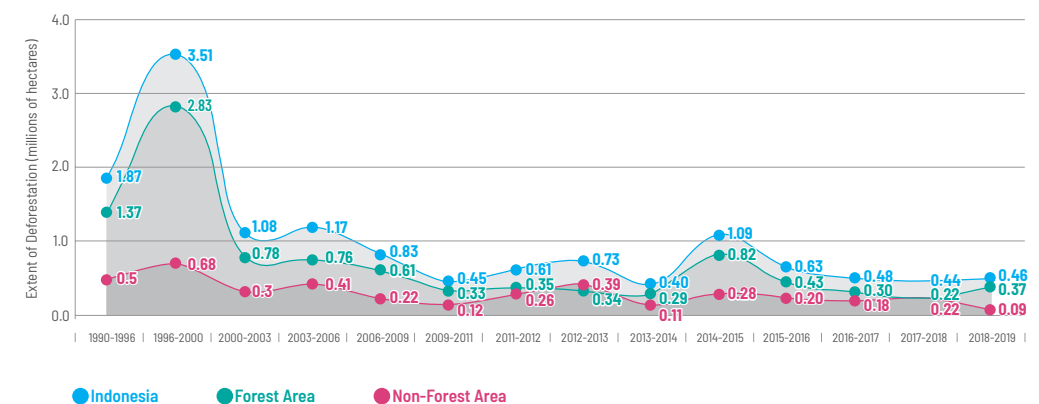
Deforestation is the conversion of forest to another land use or the long-term reduction of tree canopy cover below a 10 percent threshold (FAO, 2000). The FAO's use of "long-term" is debatable, and complicated for Indonesia, a country with fast rates of vegetation regrowth.

The Decree of the Minister of Forestry of Indonesia No. 30/2009 defines deforestation as the "permanent alteration from forested area into a non-forested area as a result of human activities" (MoFor, 2009). The definition of deforestation as "permanent alteration" helps to highlight the importance of natural forests. Areas of natural forest with temporary de-stocking which then experience regeneration do not count as having undergone deforestation. The definition nevertheless takes account of the fact that, in most cases in Indonesia, natural forest cover that has been changed (cleared) to become non-forested land rarely grows back into natural forest. Such areas are most typically utilized for non-forest purposes. Any forest regeneration following succession stages that does occur in such places will most likely be interrupted by other anthropogenic activities.

The definition of deforestation in this document as a one-time permanent conversion of natural forest cover into other land cover categories was selected for the sake of practicality, simplicity and the clarity it lends to land cover class identification and classification processes.

The related term "gross deforestation" was introduced in a 2008 Indonesia Forest Climate Alliance (IFCA) document. It counts only what has been lost (natural forest cleared) and does not take into consideration the possibility of forest regrowth (both natural and human intervention), nor carbon sequestration from forest regrowth. Gross deforestation is different from "Net deforestation" where re-growing secondary forests and forest plantations are counted.

SOURCE: 2016. National Forest Reference Emission Level for Deforestation and Forest Degradation: In the Context of Decision 1/CP.16 para 70 UNFCCC (Encourages developing country Parties to contribute to mitigation actions in the forest sector): Post Technical Assessment by UNFCCC. Directorate General of Climate Change. The Ministry of Environment and Forestry, Indonesia.



SOURCE: KLHK, 2020a

► **FIGURE 3.2** Indonesian deforestation trends from 1990 to 2019

In the subsequent period, the rate of deforestation again declined. From 2015 to 2016, annual deforestation was 0.63 million hectares. In 2016 to 2017, the process of calculating deforestation was based on image interpretation derived from the LDCM (Landsat Data Continuity Mission) 8 OLI and forest area data for 2017. This process showed that over that year, the extent of annual deforestation declined again to 0.48 million hectares. In 2016 to 2017, the extent of deforestation in the Forest Area stood at 0.30 million hectares (61.9 percent of the total), a decline from the figure of 0.43 million hectares recorded in 2015 to 2016. Similarly, in 2016 to 2017, the extent of deforestation in public land (Non-Forest Areas) designated for other purposes (APL) also declined and stood at 0.18 million hectares (38.1 percent of the total). In the period of 2017 to 2018, total net deforestation has declined again to 0.44 million hectares, with equal balance of deforestation in Forest Area and APL. In the period of 2018 to 2019, total net deforestation increased again to 0.46 million hectares. The extent of deforestation in the Forest Area stood at 0.37 million hectares, and the extent of deforestation in non-forest area was 0.09 million hectares. A breakdown of the extent of (net) deforestation based on forest types in 2018 to 2019 is presented in Table 3.1.

As part of forest resources monitoring, an important use of the land cover data takes place during the Strategic Environmental Assessment (SEA) process. Strategic Environmental Assessment in Bahasa Indonesia is *Kajian Lingkungan Hidup Strategis*, or KLHS. The Ministry of Environment and Forestry in collaboration with several line ministries and coordinating ministries -- including the Ministry of Agrarian Affairs and Spatial Planning/National Land Agency, the Ministry of Agriculture, the Ministry of Energy and Mineral Resources, the Ministry of Public Works and Housing, the Coordinating Ministry for Economic Affairs, and the Coordinating Ministry for Marine Affairs and Investment -- has recently completed two important SEAs, notably an SEA for the New Capital of Indonesia (henceforth 'New Capital SEA') and an SEA for the National Program of Developing Food Estates (henceforth 'Food Estate SEA'). The assessments were implemented through series of focus group discussions (FGDs) with the Participatory Rapid Ex-Ante Assessment approach, involving stakeholders at national, regional, and local levels, including local communities.

The New Capital SEA was implemented in 2019 after East Kalimantan Province was selected as the location for the nation's new capital. The purpose of the New Capital

SEA is to provide guidelines for criteria and protection, especially related with environmental and social safeguards, that must be followed as a consequence of the policy to move the nation's capital to East Kalimantan Province. The New Capital SEA aims to ensure that a sustainable development mind-set has been integrated as early as possible into the further detailed policies, plans, and programs for new capital that have been initiated in 2020, such as a master plan, spatial planning, etc.

The New Capital SEA has recommended ten criteria that must be fulfilled by the new capital development project. The New Capital:

- (1) Must have proper watershed management.
- (2) Must have a structured green space network.
- (3) Must have an average of developed/built-up land of no more than 50 percent.
- (4) Must have an efficiency in water consumption.
- (5) Must have a low ecological footprint per capita.
- (6) Must have good air quality and a 'cool' average temperature.
- (7) Must have good surface water quality.
- (8) Must fully protect the wildlife habitat within and surrounding the candidate area for the new capital.
- (9) Must have a 'tropical rainforest' landscape by revitalizing native Kalimantan dipterocarp and non-dipterocarp species
- (10) Must implement technological platforms to monitor environmental quality, land cover/forest/vegetation quality, environmental restoration progress, legal compliance, and tools to provide early warning to citizens of disasters, wildlife conflict, pollution, and solid waste.

The Food Estate SEA was initiated in 2020 in response to the need of land for food security. The location selected for this food estate is Central Kalimantan Province, where ex-Mega Rice Project (MRP) area was located. The idea is not to revive the MRP, but rather to develop an integrated food security project that is modern and sustainable, and integrates five main considerations: forests, peatlands,

spatial governance, investment and human resources, and technology. First results from the Food Estate SEA process include three recommendations with follow-up studies to be on-going throughout the coming year. The three recommendations are:

- (1) To develop the ex-MRP areas as a national food estate that is integrated, modern, and sustainable
- (2) To reposition some degraded ex-MRP lands to become a new Food Estate
- (3) To implement people-centered development, housing arrangements, and ensure village and *Adat* governance

The Food Estate SEA will be carried out without the use of fire, and without degrading peatlands. Healthy peat ecosystems will be prioritized for rewetting, and for revegetation with plants that are consistent with a natural peat ecosystem, which will provide a habitat conducive to flora, fauna, and preservation of biodiversity, all for purposes of supporting sustainable food security.

3.3 Progress in Thematic Geospatial Information

The Environment and Forestry Thematic Geospatial Information system, which is fully integrated with the National Geospatial Information Network (*Jaringan Informasi Geospasial Nasional*, JIGN), is intended to facilitate the implementation of Indonesia's One Map Policy (*Kebijakan Satu Peta*). This policy was first established in 2010, as part of a Law concerning Geospatial Information.²¹ The objective of this policy is to create a single 1: 50,000 scale map that can serve as a standard geospatial reference, based on a single standard, a single database, and a single geoportal. One Map Policy implementation is led by the Coordinating Ministry for Economic Affairs.

The One Map will enable Indonesia as a nation to move several large strides closer

► TABLE 3.1 Breakdown of Indonesia's net deforestation in 2018 - 2019

Forest type	Net deforestation (in million of hectares)									
	Forest Area						HPK	Total	APL	GRAND TOTAL
	Permanent Forest Area					Total				
	HK	HL	HPT	HP	Total					
1	2	3	4	5	6	7	8	9	10	
A. Primary forest	0.00	0.00	0.01	0.00	0.01	0.00	0.01	0.01	0.02	
B. Secondary forest	0.01	0.02	0.02	0.03	0.08	0.01	0.09	0.07	0.16	
C. Plantation forest*	0.00	0.00	0.01	0.26	0.27	0.00	0.27	0.01	0.28	
Total	0.01	0.02	0.04	0.29	0.36	0.01	0.37	0.09	0.46	

Notes: HK - Conservation Forest; HL - Protection Forest; HPT - Limited Production Forest; HP - Permanent Production Forest; HPK - Convertible Production Forest; APL - Other Use Area (Non-Forest Area);

* Data regarding plantation forest is based on image interpretation and refers to a class of forests developed by humans, which includes all types of planted forests, both Industrial Plantation Forests/IUPHHK-HT and planted forest from reforestation/regreening within or outside the Forest Area. Plantation forests are identifiable in remote sensing images as having neat patterns on flat areas and/or showing different colors in comparison to surrounding areas with steeper topography.

²¹ Undang-Undang Republik Indonesia No. 4 Tahun 2011 tentang Informasi Geospasial dan Peraturan Presiden No. 27 Tahun 2014 tentang Jaringan Informasi Geospasial Nasional.

to good resource governance, as it will show the geo-spatial locations of all sites of current and future resource exploitation which have been awarded at all levels of government -- including but not limited to natural forest timber concessions, industrial timber plantations, oil palm plantations, mining licenses and contracts of work, and oil & gas production sharing contracts -- and the extent to which these overlap with one another.

The Indonesian Government has promulgated a range of regulations to accelerate the implementation of the One Map Policy²², with these regulations intended to facilitate the resolution of conflicts related to land use and the accurate identification of borders between regions throughout Indonesia. 85 “thematic maps” (that is to say, maps of geospatial phenomena, ranging from provincial and district/city borders, to categories of land use, to roads, to rivers, to resource exploitation concessions) had been completed by 2019.

One technical challenge being faced by the One Map Policy is that different scales, different projections, and different base maps (1:250,000 RBI Map, 1:50,000 and 1:100,000 Topographic Maps, JOG Map scale 1: 250,000, Forestry Thematic Digital Map scale 1: 250,000) were established at different points in time, as various provincial maps and resource concessions came into force. Another challenge is the fact that technologies for making the base maps (RBI maps) have also changed over time, which means that newer maps are far more accurate than older maps. A final challenge is that administrative boundaries are not yet completed in some regions of Indonesia.

To overcome these challenges, measures are being conducted on an ongoing basis to synchronize thematic geospatial information with each theme's data custodian through the analysis of secondary data, meetings and

discussions with relevant stakeholders, and field visits.

Of the 85 themes mentioned above, the Ministry of Environment and Forestry is responsible for nine themes related with the environment and forestry sectors. The mandates are to collect, maintain and update, as well as exchange and disseminate, geospatial data related with environment and forestry. In addition, the Ministry is also preparing geospatial data that can be accessed by broader communities, and is developing a system to access geospatial information that is integrated with the JIGN system.

To ensure availability of the geospatial information integrated with JIGN, and especially to achieve the One Map Policy target, the Ministry of Environment and Forestry's Geospatial Information Network (*Jaringan Informasi Geospasial - Kementerian Lingkungan Hidup dan Kehutanan*, JIG-KLHK) was developed. All geospatial data and geospatial information within the Ministry are integrated and managed under one standard, stored in one geodatabase, available from one geoportal, and accessible by all units within the Ministry as well as other users. JIG-KLHK has 61 types of thematic geospatial information (*Informasi Geospasial Tematik*, IGT), accessible by all data custodians within the Ministry as well as by other government institutions and local governments. Of these, the 28 most-requested IGT are published online and publicly accessible in the format of mapservice, notably in WEBGIS (<http://webgis.menlhk.go.id>) and in GEOPORTAL KLHK (<http://geoportal.menlhk.go.id>).

In the efforts to support the One Map Policy and achieve an integrated, accurate, secure, and transparent JIG-KLHK, the Ministry of Environment and Forestry has been implementing several strategies and corrective actions, as follows:

- Improvement in the policy and regulation, through the issuance in 2016 of a Ministerial Regulation on Geospatial Information Network (P.28/Menlhk/Setjen/KUM.1/2/2016) and the issuance in 2020 of a Directorate General of Forestry Planology and Environmental Administration Regulation on the Management and Dissemination of KLHK Geospatial Information Guidelines (Perdirjen PKTL No.P.4/PKTL/SETDIT/KUM.1/3/2020)
- Strengthening JIG-KLHK management through the issuance in 2020 of a Director General of Forestry Planology and Environmental Administration Decree on the JIG-KLHK Management Team (Keputusan Direktur Jenderal Planologi Kehutanan dan Tata Lingkungan No. SK.28/PKTL/KUM.1/5/2020), which establishes a clearing unit and 33 data custodians within the Ministry.
- Improving IGT standards through the Environment and Forestry Geospatial Data and Metadata Dictionary
- Improving technology and network infrastructure
- Strengthening and updating spatial databases by data custodians and based on the rules and regulations above
- Building human resources capacity in JIG-KLHK management
- Updating Forest Area Designation Maps to a scale of 1:250,000
- Updating Forest Area Stipulation Maps (the results of boundary marking activities) to a scale of at least 1: 50,000
- Integrating *Adat* Forest Maps to a scale of 1:50,000
- Updating Community Plantation Forest Maps to a scale of at least 1:50,000
- Integrating Forest Concession Areas Maps to a scale of at least 1:50,000
- Integrating the Zoning Map of National Parks to a scale of 1:50,000
- Updating Forest Resource Balance Maps to a scale of at least 1:250,000
- Updating Special Purposes Forest Area Maps to a scale of at least 1:50,000
- Updating Watershed Maps to a scale of 1:50,000

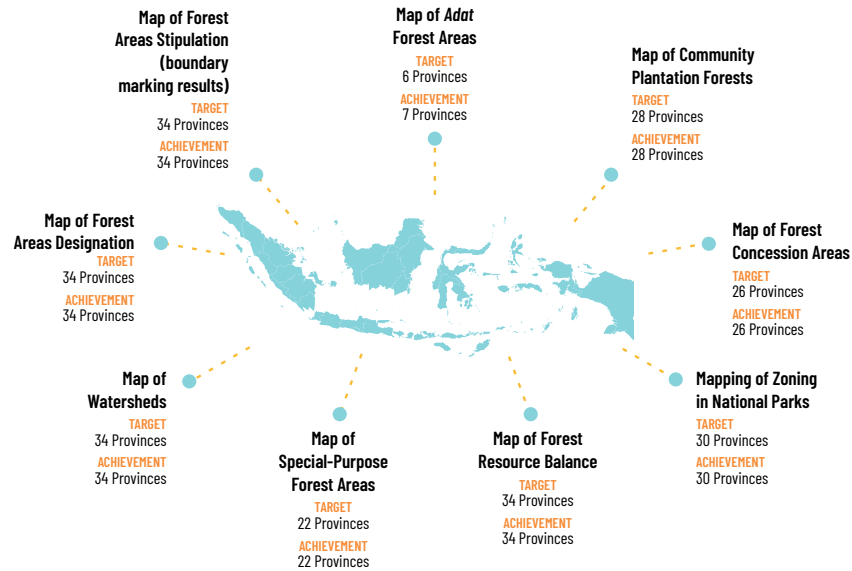
Since 2019, efforts have been made to synchronize data changes and data updates in Thematic Geospatial Information between all of Indonesia's different ministries and institutions.

With regard to climate change adaptation, the Ministry of Environment and Forestry established in 2014 the National Vulnerability Index Data and Information System (*Sistem Informasi dan Data Indeks Kerentanan*). Widely known as SIDIK, updates occur every 3 years. The most recent information from SIDIK shows that 7,178 out of 83,932 villages (8.5 percent) are categorized as vulnerable and highly vulnerable to climate change. As many as 4,427 out of 7,178 those vulnerable villages (65 percent) are located in or near the Forest Area. This information will help incorporate action on climate adaptation into national forest management activities. Further information on village vulnerability can be found in the SIDIK website: www.sidik.menlhk.go.id.

The results of One Map Policy process -- up to, but not including the integration phase -- were published in December 2018 through the National Geospatial Information Network. The nine specific themes for which the Ministry of Environment and Forestry is responsible are part of the 61 IGT and are summarized in Figure 3.3.

As of December 2019, the Ministry of Environment and Forestry had completed the following tasks:

²² Peraturan Presiden Republik Indonesia No. 9 Tahun 2016 tentang Percepatan Pelaksanaan Kebijakan Satu Peta.



SOURCE: Tim PKSP, 2019

► **FIGURE 3.3** Targets and achievements of the One Map Policy implementation, as of December 2019

3.4 Legal Certainty in the Management of the Forest Area

To improve legal certainty in the management of the Forest Area (*Kawasan Hutan*), measures are being conducted to clarify and mark the boundaries of the Forest Area, and to raise public recognition of and legitimation for the rights of communities to use of land in certain areas both surrounding and inside the Forest Area. According to targets established by the Ministry of Environment and Forestry for the period of 2015 to 2019, around 101 million hectares of Forest Area would have its boundaries mapped and physically marked by the end of this period, representing 80 percent of the Forest Area, whose terrestrial and marine areas together total around 125.8 million hectares. As of December 2019, around 88 million hectares of the Forest Area had their boundaries marked, representing about 87 percent of the 101 million hectares target.

3.4.1 Moratorium Policy on the Utilization of Primary Natural Forests and Peatlands

The Moratorium on the utilization of primary natural forest and peatlands is an extremely significant forest protection measure formulated by the Indonesian Government. It involves the temporary suspension on the issuance of new concessions in primary natural forest and peatland areas, including Conservation Forest, Protection Forest, Production Forest, and even in areas allocated for other uses (APL). The legal basis for the policy is a Presidential Instruction, which was initially valid for two years, and has since been extended three times.²³

²³ This policy is mandated through Presidential Instruction No. 10 of 2011 (Instruksi Presiden Republik Indonesia No. 10 Tahun 2011 tanggal 20 Mei 2011 tentang Penundaan Pemberian Izin Baru dan Penyempurnaan Tata Kelola Hutan Alam Primer dan Lahan Gambut). The Instruction has been extended three times through Presidential Instruction No. 6 of 2013 (Instruksi Presiden Republik Indonesia No. 6 Tahun 2013), Presidential Instruction No. 8 of 2015 (Instruksi Presiden Republik Indonesia No. 8 Tahun 2015), and Presidential Instruction No. 6 of 2017 (Instruksi Presiden Republik Indonesia No. 6 Tahun 2017). In the latest Presidential Instruction No. 5 of 2019 (Instruksi Presiden No. 5 Tahun 2019) there was a change from "suspension (*penundaan*)" to "termination" (*penghentian*) of the Issuance of New Licenses and Governance Improvement of Primary Natural Forest and Peatlands."

To guide the implementation of the Presidential Instruction, the Ministry of Environment and Forestry immediately issued a follow-on Ministerial Decree to which was appended an "Indicative Map for the Suspension of the Issuance of New Licenses for the Utilization of Forest Resources and Forest Areas, and of Revisions to the Designation of Forest Areas and Other Use Areas." The title of the map is abbreviated with the acronym of PIPPIB and is referred to as "The Moratorium Map." This map decree was first issued in 2011 and has been renewed at six-month intervals ever since. In December 2018, the 15th revision to this decree was issued.²⁴

In August 2019, with the issuance of the latest Presidential Instruction, there was a change in nomenclature from "suspension" to "termination" (See Box 3.3). The Ministry of Environment and Forestry then issued a follow-on Ministerial Decree to which was appended an "Indicative Map for the Termination of the Issuance of New Licenses for the Utilization of Primary Natural Forest and Peatlands."²⁵

²⁴ Keputusan Menteri LHK No. SK.8559/MENLHK-PKTL/IPS/DH/PLA.1/12/2018 tanggal 17 Desember 2018 tentang Penetapan Peta Indikatif Penundaan Pemberian Izin Baru Pemanfaatan Hutan, Penggunaan Kawasan Hutan dan Perubahan Peruntukan Kawasan Hutan dan Areal Penggunaan Lain (Revisi XV).

²⁵ SK.4945/MENLHK-PKTL/IPS/DH/PLA.1/2020 tentang Penetapan Peta Indikatif Penghentian Pemberian Izin Baru Hutan Alam Primer dan Lahan Gambut Tahun 2020 Periode II

As of revision XIV of the PIPPIB, the area covered by the moratorium stood at 66.1 million hectares, of which: 51.5 million hectares was accounted for by the entire extent of Indonesia's terrestrial Conservation Forests (*Hutan Konservasi*) and Protection Forests (*Hutan Lindung*); 5.4 million hectares consisted of all peat forests that are unencumbered with licenses and which stand in either in Production Forests (*Hutan Produksi*) or in Areas for Other Uses (APL); and 9.3 million hectares of primary natural forest that are unencumbered with licenses and stand in either in Production Forests or APL. In a 2020 Indicative Map for the Termination of New Licenses, the figures changed slightly, to 66.3 million hectares in total, with 51.3 million hectares of Conservation and Protection Forest, 5.3 million hectares of unencumbered peat forest inside Production Forest or APL, and 9.7 million hectares of unencumbered primary forest inside of Production Forest and APL, respectively.

BOX 3.3

Moratorium of New Issuance of Concession Licenses and Improvement of Governance in Primary Natural Forests and Peatlands

The first milestone of Indonesia's Moratorium Policy occurred at the UNFCCC Conference of the Parties (COP) 13 in Bali 2007. Soon after, the Government introduced a new regulatory measure restricting any new concession license in natural primary forests and peatlands, widely known as the "moratorium policy." This moratorium policy was legalized through a 2011 Presidential Instruction temporarily suspending issuance of new concession licenses in primary natural forest. The Presidential Instruction was for a period of, and was renewed, every two years, until 2017. Each Presidential Instruction has been implemented by the issuance of Moratorium Map by the Minister of Forestry (since 2014, the Minister of Environment and Forestry), and this map had been revised every 6 months. In 2019, the Presidential Instruction No. 5 of 2019 permanently stopped the issuance of new licenses in primary natural forests and peatlands. This last Presidential Instruction aims to further improve the governance of natural primary forests and peatlands. This means the moratorium on the issuance of new licenses in primary natural forests and peatlands is permanent, and the Moratorium Map is fixed, even though revisions to it will be undertaken every six months in order to accommodate any exceptions, as stated in the Presidential Instruction. The moratorium will be "permanent," until primary natural forests and peatlands governance is improved.

Indonesia's decision to make the moratorium permanent 8 years after its inception was based on the following considerations:

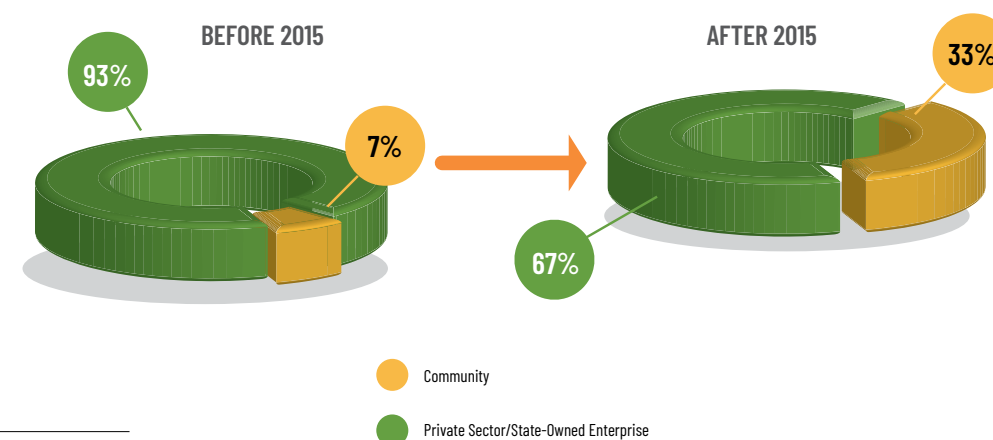
- (1) The continuing stability of the size of the area under moratorium since 2017, about 66 million hectares,
- (2) A significant decline in the rate of deforestation (in 2017, deforestation stood at only 38 percent of what it was in 2011),
- (3) To optimize existing concession licenses based on forest enterprise policy directives since 2011,
- (4) Moratorium areas have potential for contributing to NDC targets through the REDD+ mechanism and may receive REDD+ result-based payments through the Environmental Fund Management Agency which was being developed, and
- (5) To simply administrative processes by not having to renew the moratorium every two years.

3.4.2 The Provision of Land for Communities and Non-forestry Sectors

With Indonesia's expanding economy and increasing population, the demand for land is becoming more intense. Means for meeting this demand may include the release of areas from the Forest Area for purposes such as transmigration settlements and agricultural use; a redesignation of the status of areas within the Forest Area; and the increased use of areas within the Forest Area through land swap practices. The allocation of areas within the Forest Area to support the activities of non-forestry sectors balances environmental considerations against what the Indonesian Government likes to

refer to as 'considerations of equity' a term which appears to encompass both the needs of forest communities as well as the needs of certain non-forest industries that are located in the Forest Area.

Prior to 2015, policies related to the utilization of forest areas mainly prioritized the needs of the private sector and state-owned enterprises. Since 2015, the Government has launched an Equitable Economy policy to reduce inequality (see Figure 3.4). A significant component of this policy involves measures to provide a major role to communities to manage forests and forest land. The policy consists of three pillars, focused respectively on land, business opportunities, and human resource capacity building. The agrarian



SOURCE: KLHK, 2018b

► FIGURE 3.4 Utilization of forest areas by communities prior to 2015 and targets for the future

reform (*Tanah Obyek Reforma Agraria*, TORA) and social forestry programs are an integral component of this Equitable Economy policy, being intended to ensure the availability of land for members of local and/or *Adat* communities.

The objective of the TORA program is to reduce inequality in the area of land ownership; to create sources of prosperity for communities in rural areas; to create jobs to reduce poverty; to improve public access to economic resources; to increase food security; to maintain and improve the quality of the environment; and to facilitate the resolution of agrarian conflicts.

From 2020 to 2024 the government will continue focusing on agrarian reform, including the release of forest areas to meet that objective.

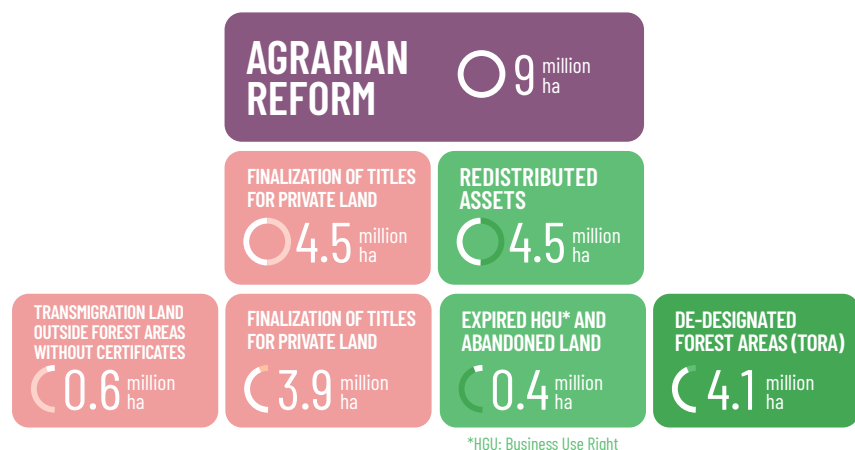
The Government has identified 9 million hectares of land that can be used to facilitate the agrarian reform program (TORA). This consists of 4.5 million hectares, for most of which full legal ownership status needs to be finalized. As for the remaining 4.5 million hectares, this is comprised of public land. Of that 4.5 million hectares of public land, 4.1 million

hectares is in the Forest Area (see Figure 3.5 below).

The 4.1 million hectares in the Forest Area that is slated for land reform has been identified and mapped under the auspices of a Ministry of Environment and Forestry Decree and an "Indicative Map of Forest Areas for the Provision of Land for the Agrarian Reform Program (TORA)" now in its fourth version.²⁶ Of the 4.1 million hectares of Forest Area that will be allocated for purposes of land reform, Figure 3.6 shows the status of 4.05 million of those hectares, as follows:

- 1.22 million hectares are areas of Convertible Production Forest which are no longer productive
- 0.06 million hectares is to be reserved for the establishment of new rice fields
- 0.67 million hectares is already established as *fasos fasum*, an Indonesian government acronym which refers to a cluster of houses that are accessible by road, served by sewers and electricity,

²⁶ Keputusan Menteri LHK No. SK.7434/MENLHK-PKTU/KUH/PLA.2/9/2019 tentang Peta Indikatif Lokasi Kawasan Hutan untuk Penyediaan Sumber Tanah Obyek Reforma Agraria (TORA) (Revisi IV).



SOURCE: KLHK, 2019c

► FIGURE 3.5 Land allocated for agrarian reform

and with the trappings of a community, such as schools and places of worship

- 0.37 million hectares already have cultivated rice fields and/or fish ponds
- 1.73 million hectares are already being used for dryland farms, and contain springs upon which communities depend for their primary sources of water

Figure 3.6 below also shows two types of land outside of the Forest Area that will be allocated toward land reform objectives, namely, 0.44 million hectares released some time ago from the Forest Area to oil palm companies which has now been abandoned by those companies, and 0.48 million hectares of transmigration areas that are outside of the Forest Area, already established as *fasos fasum*, and awaiting final land certificates.

As of December 2019, of the TORA program's target of 4.1 million hectares, 2,657,007 hectares had been realized, consisting of 1,678,980 hectares of land released, and another 978,107 hectares allocated.

The Indonesian Government's social forestry program calls for allocating a total of 12.7 million hectares of Forest Area for management by local communities

through five separate social forestry schemes, namely Community Forests (*Hutan Kemasyarakatan*, HKM), Village Forests (*Hutan Desa*, HD), Community Plantation Forests (*Hutan Tanaman Rakyat*, HTR), Forestry Partnerships (*Kemitraan Kehutanan*), and *Adat* Forests (*Hutan Adat*, HA). In order to fulfil the legal requirements to participate in the social forestry programs, communities must comply with procedures set forth in the Ministerial Regulation concerning Social Forestry,²⁷ the Ministerial Regulation concerning Social Forestry in State-Owned Forestry Enterprise Areas²⁸ and the Ministerial Regulation concerning *Adat* Forest and Rights Forest.²⁹ In practice, 1.7 million hectares of the 12.7 million hectares has been granted to date.

For decades, parts of the Forest Area have also been re-allocated for purposes besides land reform and social forestry.

²⁷ Peraturan Menteri LHK No. P.83/MENLHK/SETJEN/KUM.1/10/2016 tentang Perhutanan Sosial.

²⁸ Peraturan Menteri LHK No. P.39/MENLHK/SETJEN/KUM.1/6/2017 tentang Perhutanan Sosial di Wilayah Kerja Perum Perhutani.

²⁹ Peraturan Menteri LHK No. P.21/MENLHK/SETJEN/KUM.1/4/2019 tentang Hutan Adat dan Hutan Hak.



SOURCE: KLHK, 2019c

► FIGURE 3.6 Identification of types of land set aside for the agrarian reform (TORA program) and their indicative size

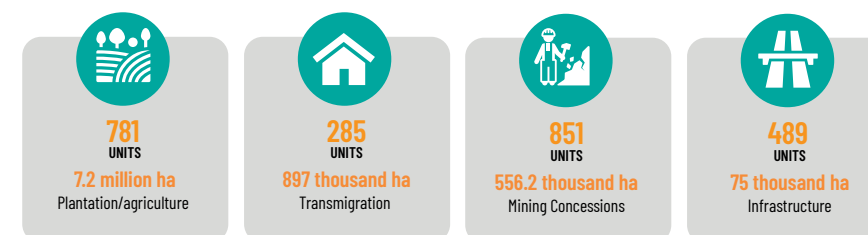
As of December 2019, nearly 7.2 million hectares had been released from the Forest Area for the establishment of agricultural (mostly oil palm) plantations, 0.9 million for transmigration sites. 556.2 thousand hectares has been leased to mines, and 75 thousand hectares leased to infrastructure projects. See Figure 3.7 below.

of global palm oil trade. However, the development of palm oil plantations has been complicated, and has attracted concern, because the oil palm sector is one of the main drivers of deforestation in Indonesia. At the same time, oil palm produces 4 to 10 times more oil per hectare than any other edible oil crop³⁰. In addition, the oil palm sector makes a significant contribution to the Indonesian economy. The production of oil palm in

3.4.3 Moratorium of Oil Palm Expansion

Indonesia and Malaysia dominate the world market in Crude Palm Oil (CPO) and contribute to approximately 80 percent

³⁰ <http://www.environmenttimes.co.uk/news/item/661-disagreement-over-iceland-s-methods-of-tackling-palm-oil-s-biodiversity-impact>



Notes:
- Data on the Use of Forest Areas is limited to lease activities for production operation in forest areas

SOURCE: KLHK, 2020a.

► FIGURE 3.7 The release and lease-use of forest areas as of December 2019

Indonesia reached 32.2 million tons or 58 percent of world production in the year 2016³¹. The increase of international demand for oil palm means that more land is needed for oil palm plantations. The Indonesian government is very much aware of the environmental impact from land conversion for this promising commodity and has placed environmental considerations as a key administrative priority, in order to stop the deterioration of the nation's tropical forests. The decrease in deforestation rates within and outside the Forest Area, is a result of a series of sustainability efforts including a moratorium on all types of new resource concessions in areas of primary forests and peatland (PIPPIB), including oil palm plantations.

The market-friendly decision by the European Union on 14 June 2018 to continue importing palm oil up to 2030, will increase demand for oil palm from Indonesia, thus increasing the production of palm oil in Indonesia. The Indonesian Government cautiously welcomes the EU's decision, but the Ministry of Environment and Forestry is focused primarily on sharpening its "forest governance perspective on sustainable oil palm," which will serve to further operationalize corrective government policies with respect to oil palm.

The Indonesian Sustainable Palm Oil (ISPO) system is a palm oil standard adopted by the Indonesian Government to improve the competitiveness of the Indonesian palm oil in the global market and to reduce greenhouse gases emissions. ISPO promotes the use of sustainable standards for oil palm grown in Indonesia in order to minimize impacts on the environment, climate and biodiversity, and the use of certification to safeguard

rainforests. But there are still a number of efforts that need to be undertaken in order to ensure better implementation of the ISPO standard in the field, and to deliver tangible results in terms of improving the environmental practices of the oil palm sector.

In order to protect peatland from oil palm plantation expansion, the government has produced a government regulation³² on peatland ecosystem management and protection. See Section 3.7 below.

After almost three years discussion, in September 19, 2018, Presidential Instruction 8 of 2018 on "the Suspension and Evaluation of Oil Palm Plantation Permits and Increasing Productivity of Oil Palm Plantation" (henceforth 'Oil Palm Licensing Review') was signed into force by the President of the Republic of Indonesia, Joko Widodo.

The Oil Palm Licensing Review is empowered to run for a period of three years, from the date that Presidential Instruction 8 of 2018 was signed into force.

3.4.4 Law Enforcement

The use of land for economic activities has resulted in disturbance to forest security in the forms of encroachment, illegal logging, forest and land fires, and the illegal wildlife trade. The Ministry of Environment and Forestry has taken measures to address such illegal activities through intensive law enforcement. In order to increase the rate of compliance with the law and to create a strong deterrent effect, the Indonesian

Government is equipped with three legal instruments, which are Administrative Sanctions, Criminal Law Enforcement and Civil Law Enforcement.

With respect to Administrative Sanctions, from January 2015 to mid-September 2020, the Ministry of Environment and Forestry has issued 1,456 Administrative Sanctions, of which more than a third are in relation to forest and land fires.

With regard to Criminal Law Enforcement, the Ministry has submitted 892 cases to trial, of which all but 40 pertain to illegal logging, forest encroachment, and the illegal wildlife trade. Of these 892 cases, 210 cases are being actively taken forward by the National Police and the Office of the Attorney General.

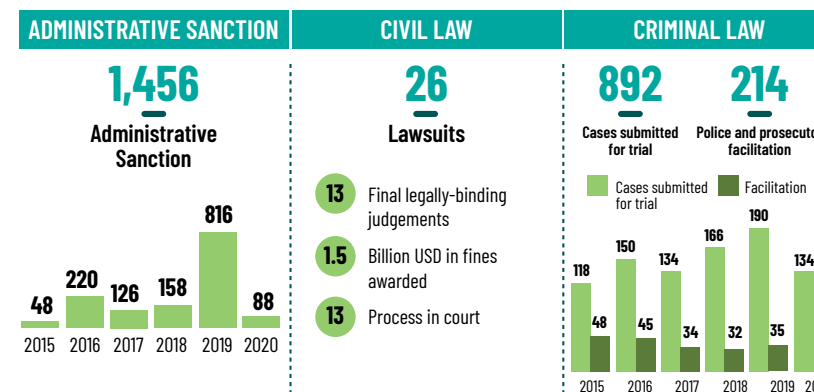
As for Civil Law Enforcement, the Ministry has initiated 26 civil lawsuits. Final judgements have been reached on 13 of these, with a total of USD 1.5 billion in fines handed down.

Ministry law enforcement officers -- including inspectors, investigators, and forest rangers -- were actively involved in achieving results in all three of these areas.

Figure 3.8 shows the results of these three categories of Law Enforcement efforts for the period of 2015 to mid-September, 2020.

3.4.4.1 Law Enforcement for Forestry Related Crime

To address disturbances and threats to Indonesian forest, the Ministry of Environment and Forestry conducts operations to control the Forest Area and the circulation of forest products. Operations are carried out together by Forest Rangers and the Forest Rangers Quick Response Unit (*Satuan Polisi Hutan Reaksi Cepat, SPORC*), local governments, the Indonesian Armed Forces (TNI) and the Indonesian National Police (POLRI). Operations are held after receiving reports from the Forest Management Unit within whose jurisdiction the alleged crime has taken place, as well by communities or NGOs, and social media monitors. Operations typically target three types of illicit activities, namely, forest area



SOURCE: KLHK, Data as of September 2020

► FIGURE 3.8 Achievement of law enforcement instrument implementation from 2015 to 2020

³² Peraturan Pemerintah Republik Indonesia No. 57 Tahun 2016 tentang Perubahan atas Peraturan Pemerintah Republik Indonesia Nomor 71 Tahun 2014 tentang Perlindungan dan Pengelolaan Ekosistem Gambut.

³¹ ISTA Mielke GmbH, OIL WORLD, and Hamburg-1 (2017).

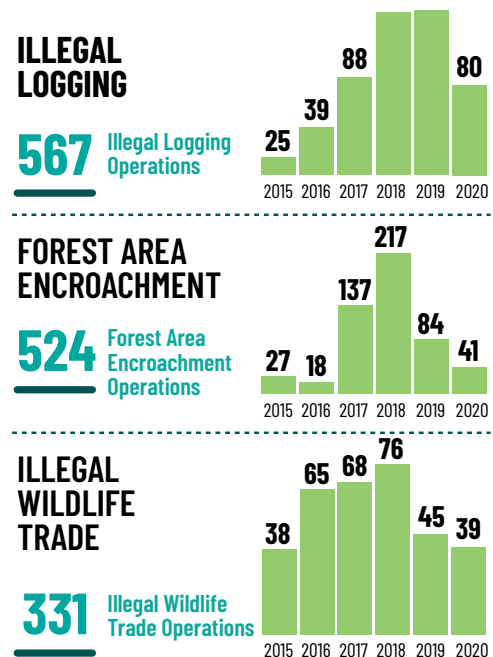
encroachment, the illegal wildlife trade, and illegal logging.

Operations against encroachment aim to secure the Forest Area from persons/companies who have encroached upon it. Operations remove encroachers from the Forest Area, and secure the area of the Forest Area that had been encroached upon, so that it can then be restored, rehabilitated, or reforested.

In the case of illegal wildlife trading, the operation involves inspections of wildlife markets, surveillance of wildlife trading and smuggling sites, monitoring of wildlife cybercrime. Information gathered is used to lead a plan to capture the actors at the precise moment a trade is conducted.

Operations against illegal logging are carried out not only in the Forest Area but also at the timber mills and factories where illegal logs are processed. Since 2018, operations were conducted not only based on inspections, but also include surveillance, the use of new forms of technology and science, and strong collaboration between government, NGOs, and communities. Therefore, the Ministry of Environment and Forestry has been able to conduct operations both in the Forest Area, during transporting process and at timber mills and factories.

Figure 3.9 presents a breakdown of the results of operations between January 2015 and September 2020.



SOURCE: KLHK, Data as of September 2020

► FIGURE 3.9 Results of operations against illegal logging, encroachment, and illegal wildlife trade in 2015 - 2020

Box 3.4 below describes operations against illegal logging in Surabaya and Makassar conducted at the end of 2018 and in early 2019.

BOX 3.4

Operations Against Illegal Logging in Surabaya and Makassar

From December 2018 to early 2019, the Ministry of Environment and Forestry conducted seizures of smuggled timber from rare tree species originating from Eastern Indonesia: Sulawesi, Maluku, and Papua. In total, there were 498 containers of timber seized, as a result of six operations, worth more than USD 10.8 million. Among the species seized were high value merbau and meranti. Confiscations took place at points of transit in Surabaya and Makassar, before smuggled timber could be distributed to wood processing industries.

Ministry investigators identified 20 suspects, varying from suppliers to buyers of the illegal timber, including four directors of timber companies, involved in these illicit activities. Two of the suspects have since been sentenced in District Courts. The Ministry will pursue new investigations of multinational actors, since findings show that the ultimate destination for products made from smuggled timber are other countries in Asia.

The law enforcement efforts undertaken against illegal logging operations have led to reforms in how timber administration is carried out in Indonesia, including: (a) revision of seven Ministerial Regulations, (b) post-audit inspection of ten timber companies, and (c) improvement of the Timber Legality Assurance System (TLAS), including audit recommendation for all indicated TLAS-certified companies. These are all examples of corrective actions in relation to timber administration undertaken by the Ministry, as a result of findings related to anti-illegal logging operations.

After those operations were conducted, the process of criminal law are started by Ministry of Environment and Forestry civil investigators (PPNS) who has authority to investigate environment and forestry cases. Table 3.2 presents the result of cases that has been submitted from investigators to prosecutors, ready to the trial stage.

3.4.4.2 Law Enforcement in Relation to Forest and Land Fires

Three legal instruments are being implemented together to increase compliance and deterrence in relation to persons/companies responsible for forest and land fire incidents in their concessions. Measures taken by the Ministry of Environment and Forestry are intensifying supervision and monitoring to improve management and bolster prevention, issuing administrative sanctions, revocation of licenses, suspension of licenses, mandatory corrective actions (*paksaan pemerintah*), written reprimands and the issuance of warning letters. As noted above, between January 2015 and September 2020, 1,456 administrative sanctions were imposed. As can be seen in Table 3.3 below, 538 of those sanctions related to forest and land fires. Administrative sanctions pertaining to forest and land fires skyrocketed in 2016 and 2019, in the immediate aftermath of

► TABLE 3.2 Number of cases submitted for trial in 2015 - 2020

Type of case	2015	2016	2017	2018	2019	2020	Total
Illegal logging	43	66	66	94	104	81	454
Forest area encroachment	28	29	8	26	11	14	116
Illegal wildlife trade	43	51	55	41	65	27	282
Total	114	146	129	161	180	122	852

SOURCE: KLHK, Data as of September 2020

the forest and land fire events of 2015 and 2019.

► **Table 3.3 Administrative sanctions issued to forests and land fires cases in 2015 - 2020**

No.	Type of sanction	2015	2016	2017	2018	2019	2020	Total
1	Revocation of licenses	3	0	0	0	0	0	3
2	Suspension of licenses	16	0	0	0	0	0	16
3	Mandatory corrective actions	4	18	11	10	35	10	88
4	Written warnings	-	115	0	0	316	0	431
Total		23	133	11	10	351	10	538

SOURCE: KLHK, Data as of September 2020

The government has also issued several new regulations and strengthened law enforcement in relation to forest and land fires, including by sending more written warnings in 2019 to companies with hot spots in their concessions. Moreover, compliance with the terms of environmental licenses is monitored to ensure that corporations have the infrastructure, procedures and human resources required to prevent and manage forest fires.

With regard to Criminal Law, from January 2015 to September 2020, the Ministry of Environment and Forestry processed six forest and land fire-related cases with good progress to the point where they were ready for trial. Eighty two additional cases are being handled by the National Police with support from the Ministry of Environment and Forestry.

The last law enforcement instrument for processing forest and land fire incidents is Civil Law. Business actors found guilty pay compensation cost and bear environmental restoration costs. With that said, civil cases involve a lengthy process, and require the involvement of District

Courts, provincial-level High Courts and the Supreme Court. In the period from January 2015 to September 2020, 21 forest and land fire cases were brought by the Ministry of Environment and Forestry before Civil Courts. Of these 21 cases, ten resulted in final legally binding judgments, but 11 cases are still being processed. Total penalties handed down by judges so far for compensation and restoration costs associated with environmental damage resulting from fires amount to USD 1.377 billion.

3.4.4.3 Fostering Innovation in Environment and Forestry Law Enforcement through Science and Technology

In mid-2017, the Ministry of Environment and Forestry began to implement a new approach in combatting crimes against the environment and forests by using science- and technology-based law enforcement. Several initiatives and activities to strengthen law enforcement include utilizing advances in science and technology, such as using wood and DNA forensics to identify timber and illegal wildlife seized by forest rangers and investigators, and using advanced digital era information technology to provide tools, systems, and multiple sources of information to support decision-making. The efforts are all incorporated through The Center of Intelligence for Environment and Forestry Law Enforcement (the CoI), which embeds surveillance, intelligence, and investigation. The CoI also serves as a learning center, a knowledge-based management tool, a big data system and functions as a command center. Due to tremendous efforts combatting crimes using science and technology, the Ministry was awarded The Asia Environmental Enforcement Awards 2019 from the United Nations Environment Programme (UNEP) (see Box 3.5).

BOX 3.5

The Asia Environmental Enforcement Awards 2019

The Ministry of Environment and Forestry received The Asia Environmental Enforcement Awards 2019 from the United Nations Environment Programme (UNEP). The ceremony was held on 13 November 2019 at the United Nations Conference Center in Bangkok. The award was given as a recognition for the Ministry's excellence and leadership in enforcement of national laws to combat transboundary environmental crimes, and includes three categories: innovation, integrity, and gender leadership, as follows:

- A Center of Intelligence for Environment and Forestry Law Enforcement (the CoI) has been established by the Ministry. The CoI is aimed at accelerating decision-making processes in combatting environment and forestry crimes, notably transboundary crime. The CoI harnesses, as well develops, systems, tools, and infrastructure in supporting law enforcement, including: cyber patrols of social media and e-commerce platforms to unveil illegal wildlife trade; the utilization of geospatial technology to capture changes on the earth's surface in order to detect illegal activities in Forest and non-Forest Areas; and the development and use of digital forensic tools. These efforts have dramatically enhanced the effectiveness of the work of combatting transboundary environmental crime.
- The Ministry has been maintaining its institutional honor by upholding integrity. Several corruption and collusion cases involving its personnel have been identified and acted on. There is no toleration of violation of integrity, especially if conducted by law enforcement officers.
- The Ministry has also actively promoted gender-equal leadership by appointing female officers in management positions and by instituting policies/facilities that support women in carrying out their functions, including provision of lactation rooms.



a Minister Siti Nurbaya discusses forest fire data and information at the Ministry's Center of Intelligence for Environment and Forestry Law Enforcement. Photo by: Ministry of Environment and Forestry, Jakarta, 2019.

b Women Forest Rangers disassemble and reassemble firearms blindfolded. Photo by: Ministry of Environment and Forestry, Jakarta, 2019.

c The Ministry of Environment and Forestry receives the Asia Environmental Enforcement Awards 2019 from UNEP, 13 November 2019 in Bangkok. Photo by: Ministry of Environment and Forestry, Bangkok, 2019.

In addition to those that have been developed by law enforcement unit, research and innovation have been done including:

1. AIKO-KLHK is an android-based Automatic Wood Identification System that is able to identify types of wood and provide information on local names, Latin names, chemical properties, durability, classification, and alternative uses. Identification used to be carried out manually and took around two weeks to obtain results. It now takes one click (one second). AIKO supports faster law enforcement.
2. Indonesia's Xylarium Bogoriense currently hosts the largest number of authentic wood specimens in the world, with 203,809 specimens collected (as of May 2020) from nearly all regions of Indonesia, consisting of 110 families, 785 genera and 3,688 species. The Xylarium Bogoriense has been recorded in Index Xylarium as the world's largest xylarium, followed by xylaria in the Netherlands and the USA. Its collection of diverse Indonesian wood species is useful for wood identification for both research and law enforcement purposes.
3. Research has been done to support the improvement of the Timber Legality Assurance System (TLAS).

Meanwhile, improvements in institutional capacity and governance of law enforcement have also been strengthened through several measures, such as:

- 1) an environmental certification program for judges and an environmental case registration system;
- 2) advanced training on the environment for investigators and prosecutors;
- 3) establishment of inter-agency data and information exchanges;
- 4) promoting a network of forest and environment experts to exchange ideas of law enforcement;

- 5) providing a channel for citizen complaints through web and mobile-based applications, in order to enable follow-up law enforcement steps, if warranted;
- 6) training paralegals to handle complaints related to environment and forestry.

3.4.5 Land Use Conflicts

The legal certainty of the Forest Area is required to ensure public legitimacy and recognition, and to provide certainty regarding land rights for communities in areas adjacent to and inside the Forest Area. A lack of legal certainty in these matters has the potential to undermine the effectiveness of the governance of the forestry sector, and to create tenurial conflicts.

Of the number of complaints related to land tenure in the Forest Area and *Adat* forests referred to the Ministry of Environment and Forestry in the period from January 2015 to May 2020, 62 cases have been completed. Two hundred and forty three cases are ongoing. A hundred and seventy nine cases have been returned to the complainants or transferred to other authorized units because of a lack of documentation or because cases could not be resolved through the award of Social Forestry permits.

Figure 3.10 below shows the flow of processes conducted by the Ministry of Environment and Forestry to manage land conflicts. Conflicts can be resolved through litigation. But a resolution process is also available which employs assessors, mediators, paralegals, and extension workers. Issues relating to a lack of certainty regarding the boundaries and status of Forest Area are addressed through the deployment of assessors from the political, social, cultural, economic,



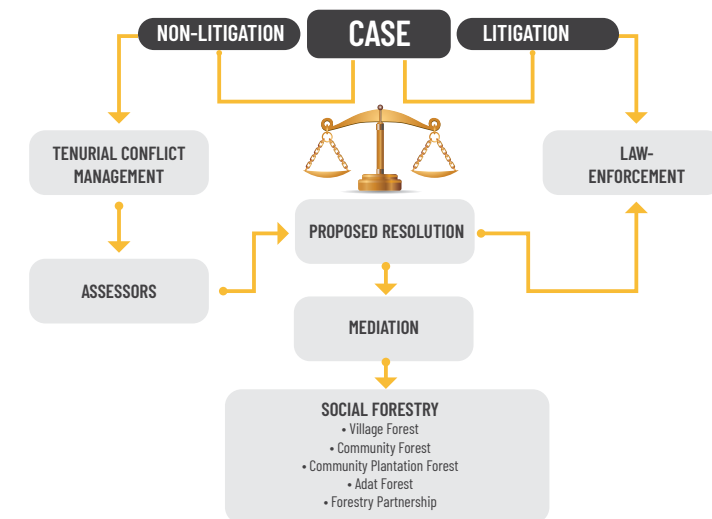
A concession's burnt area is sealed for investigation

LOCATION
Company concession in Jambi

PHOTO BY
Ministry of Environment and Forestry (2019)

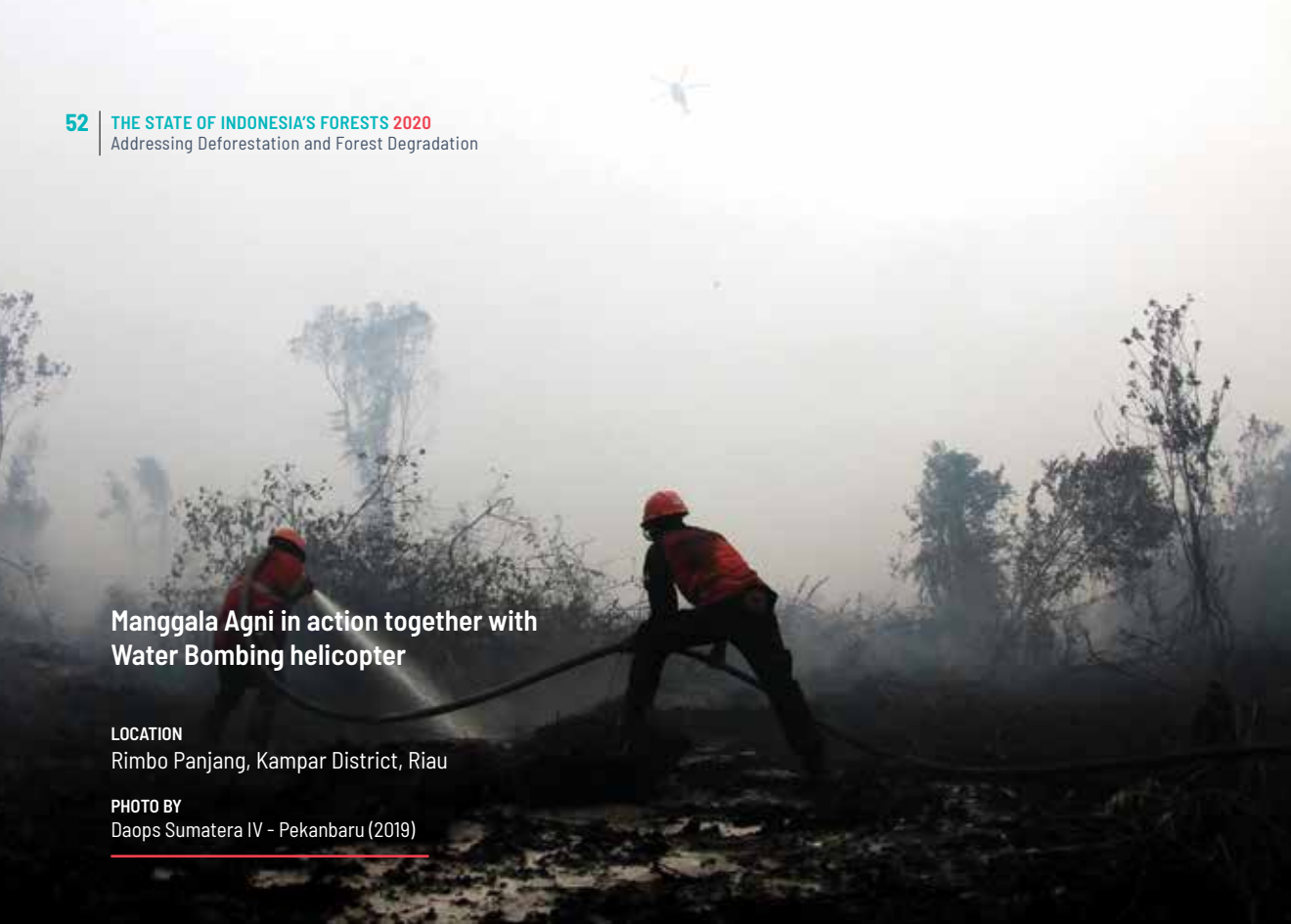
scientific, environmental and educational sectors, all of whom examine and attempt to understand the causes of the conflict. Mediators establish the steps required to resolve the conflict between parties and determine the level of willingness to enter into an agreement and accept a proposed

solution. If these conflicts are handled satisfactorily, the process contributes to harmonious relationships between all stakeholders, increased prosperity, improved environmental management, and the sustainability of business activities.



SOURCE: KLHK, 2017c

► FIGURE 3.10 Conflict management flow chart



Manggala Agni in action together with Water Bombing helicopter

LOCATION
Rimbo Panjang, Kampar District, Riau

PHOTO BY
Daops Sumatera IV - Pekanbaru (2019)

3.5 Forest and Land Fire Management

Forest and land fires in Indonesia have attracted global attention since the devastating fires in 1982/1983³³ and in 1997/1998. Significant forest and land fires occurred again in 2007, 2012 and 2015, causing transboundary haze pollution in the ASEAN region and again attracting global attention.³⁴ Since the problem of forest and land fires has continued to grow, a special institution to deal with fires has been created at the Echelon 2 (Directorate) level starting in 1999. In 2002, a program was developed for further forest and land fire control called Daops Manggala Agni. This is an institution tasked with controlling forest and land fires at the local level, and is an extension of the central government in the provinces for the purpose of controlling forest and land fires.

As a commitment to mitigate trans-boundary haze pollution, Indonesia ratified the ASEAN Agreement on Transboundary Haze Pollution (AATHP)³⁵ in 2014. This Agreement provides a framework for the control of forest and land fires at the regional level. To manage the forest and land fires, a national and local program has also been rolled out. These activities are intended to: ensure the effective management of peatland areas, while focusing on areas that are particularly prone to forest and land fires; mainstream forest and land fire control programs; ensure the active participation of all stakeholders in these programs; develop early warning systems that provide sufficient lead time to conduct control measures; eliminate and prohibit the practice of burning to clear land in high-risk areas, particularly peatlands.

³³ Syaifina, 2015

³⁴ Syaifina, 2015

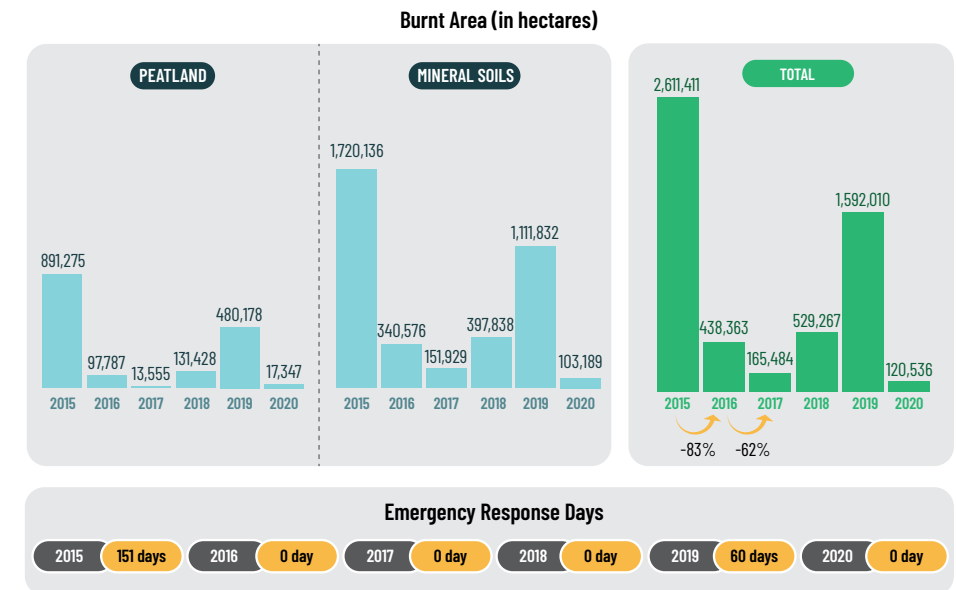
³⁵ Undang-Undang Republik Indonesia No. 26 Tahun 2014 tentang Pengesahan ASEAN Agreement on Transboundary Haze Pollution (Peretujuan ASEAN tentang Pencemaran Asap Lintas Batas).

Indonesia has been monitoring forest and land fires since 1984. At an early stage, efforts were based on ground reports through government offices in regions across the country, including occurrences of fires and estimates of burned areas. Starting in 1997, Indonesia developed a satellite-based system to monitor hotspots. From 1997 to 2006 Indonesia cooperated with Japan International Cooperation Agency (JICA) to monitor hotspots using NOAA satellites. Coverage only reached the western and central regions of Indonesia.

Since 2007, under cooperation with Landgate Western Australia and funded by AusAid, Indonesia has developed a fire watch system to monitor hotspots using Terra/Aqua (MODIS) satellites, which have thermal sensors for detecting fires and cover the entire area of Indonesia. In March 2015, the Ministry of Environment and Forestry

launched SIPONGI, an integrated system that provides hotspot information in close to real time, by combining hotspot data from NOAA, Terra/Aqua, SNPP and field data from regional government offices.

Since 2015, Indonesia has begun to seriously calculate burnt areas. This effort is used to support field activities to control forest and land fires. Burnt areas are calculated using satellite imagery data, hotspot data, ground check reports and reports from forest and land fire suppression operations. These activities and other measures have significantly improved its ability to manage forest and land fires, as demonstrated in Figure 3.11.



SOURCE: KLHK, Data up to 30 June 2020

▶ FIGURE 3.11 Burnt area and emergency response days in 2015 - 2020

Additionally, since 2018, a monitoring system using Thermal CCTV has been added at 15 fire prone locations. This program aims at making the monitoring system more reliable at particular areas, so officers can respond faster with ground checks. In line with this, the Ministry of Environment and Forestry issued a regulation No P.8/MENLHK/SETJEN/KUM.1/3/2018 regarding standard operating procedures (SOP) for hotspot ground-checks and all related information from the ground.

As a result of all these development efforts, in 2019 SIPONGI received a TOP 45 Public Service Innovation Award from the Vice President of Indonesia and a TOP 99 Public Service Innovation Award from The Ministry of Administrative and Bureaucratic Reform.

According to many experts, forest and land fires in Indonesia are anthropogenic, but the fires in 2019 prove that forest and land fires in Indonesia are also strongly influenced by weather and climate. This is clearly illustrated in 2019 where forest and land fires occurred globally. Fires in Canada burned 1.8 million hectares;³⁶ USA, 1.9 million hectares;³⁷ Russia, 9.9 million hectares;³⁸ Australia, 18.6 million hectares;³⁹ Indonesia 1.6 million hectares.⁴⁰

While forest fires are cyclical, typically occurring in Indonesia every year from July through October, the fires in 2019 began in January 2019 and lasted until the end of the year. This was because of the higher average temperature compared to 2018, a rainy season that came later than usual, days without rain reaching as high as 150 days in various regions, and the influence of changes in the global climate. Efforts to undertake cloud seeding were constrained by the absence of

clouds above locations of forest and land fires.

Figure 3.12 below shows monthly trends in the number of hotspots in the period from 2015 to 2020. This figure is based on data derived from NOAA satellites managed by the ASEAN. The hotspot data only covers the western and central regions of Indonesia. The highest number of hotspots was recorded in 2015, with a relatively high proportion of incidents occurring in June to November. The same trends were observed in 2019, at lower levels, between July to October.

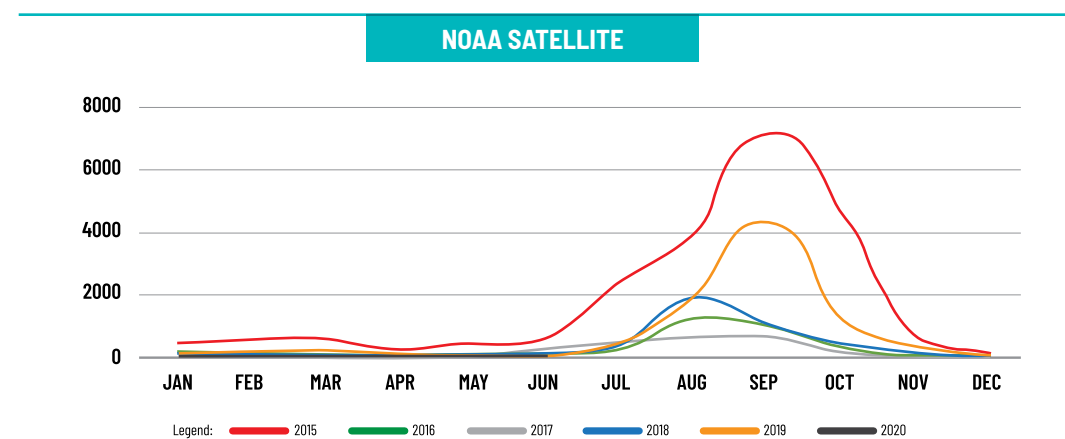
Using data derived from Terra Aqua satellites that cover all regions of Indonesia, including the eastern region, for the same period (2015-2020), similar trends can be observed (see Figure 3.13). The highest number of hotspots was recorded in 2015, with a relatively high proportion of incidents occurring in June-November. The same trends were observed in 2019, at lower levels, between July to October.

Learning lessons from many years of forest and land fires, in 2020 Indonesia started to carry out cloud seeding⁴¹ operations before the peak of the dry season. This has been done especially in fire-prone provinces, such as Riau, South Sumatra, Jambi. This operation involves various government agencies, including the Ministry of Environment and Forestry, as well as the Meteorology, Climatology and Geophysics Agency (BMKG), the Agency for the Assessment and Application of Technology (BPPT), the Indonesian Military (TNI), and the National Agency for Disaster Management (BNPB).

Weather modification with cloud seeding is mainly carried out in areas that have peatlands or areas that are predicted to experience severe drought. Weather modification carried out during the transitional period before the dry season is more effective to keep peatlands in a wet condition, overcoming potential

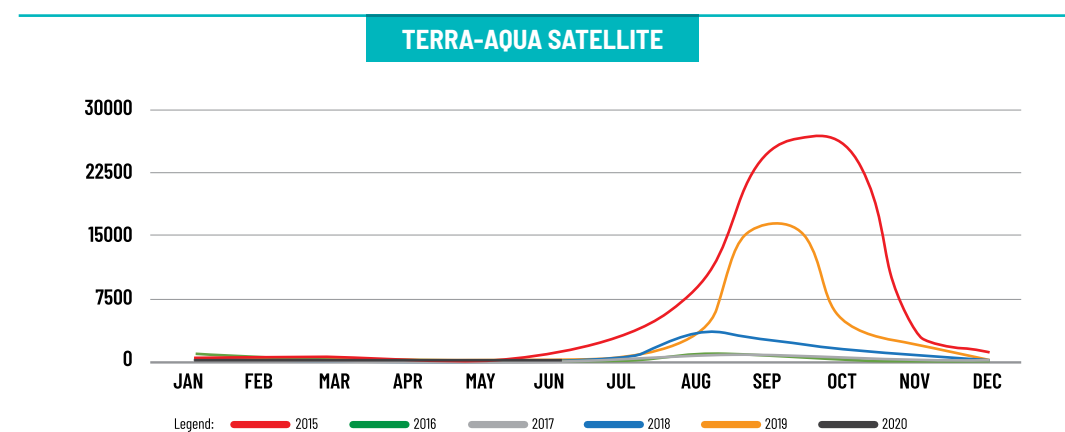
drought and filling up water reserves which can later be used to extinguish fires, thus reducing risk. Challenges have always

occurred, however. The COVID-19 pandemic has made preparation for forest and land fire mitigation harder (See Box 3.6).



SOURCE: KLHK, Data as of June 2020

► FIGURE 3.12 Number of monthly hotspots from 2015 to 2020 based on the NOAA Satellite data



SOURCE: KLHK, Data as of June 2020

► FIGURE 3.13 Number of monthly hotspots from 2015 to 2020 based on Terra Aqua Satellite data

³⁶ <https://www.ctvnews.ca/canada/1-8-million-hectares-of-canada-burned-by-forest-fires-so-far-this-year-1.4570733>

³⁷ <https://crsreports.congress.gov | IF10244 - VERSION 39 - UPDATED>

³⁸ <https://www.statista.com/statistics/1036723/russia-area-burnt-by-forest-fires-by-region/>

³⁹ https://en.wikipedia.org/wiki/2019%E2%80%932020_Australian_bushfire_season

⁴⁰ <https://sipongi.menlhk.go.id>

⁴¹ Cloud seeding is a type of weather modification that aims to change the amount or type of precipitation that falls from clouds by dispersing substances into the air that aid in cloud condensation and precipitation.

BOX 3.6 Forest and Land Fire Mitigation Activities during the COVID-19 Pandemic

Due to the COVID-19 pandemic, forest and land fire control operations have been adjusting. Since April 2020, Manggala Agni has been adapting to COVID-19 protocols and carrying out its activities in new ways:

- Maximum team sizes are 15 people, while only 5 people may work in the Command Post at any time.
- Locations for patrols are determined more carefully and precisely, because of travel restrictions and COVID-19 surveillance zones.
- Personnel who carry out operations are equipped with personal protective equipment, including masks, hand sanitizers, and vitamins, and are trained to follow health protocols, such as frequent hand washing, avoiding crowds, physical distancing, maintaining personal health, bathing, changing clothes, getting enough rest, and eating foods that contain lots of vitamins. Self-isolation is imposed for at least 14 days for personnel who experience COVID-19 symptoms.
- Manggala Agni is involved in the COVID-19 Control Task Force in various regions, by combining integrated patrols and campaigns for forest and land fire mitigation with campaigns for prevention of COVID-19. Awareness campaigns provide information to the public about the importance of preventing forest and land fires, as well as preventing the spread of COVID-19.
- Conducting sympathetic operations, such as providing free disinfectant spraying services in public places and residential areas, using disinfectant from wood vinegar produced by Daops Manggala Agni, distributing masks and hand sanitizers to the public, as well as modeling COVID-19 protocols by wearing masks properly, physically distancing, etc.

3.5.1 Changes to Forest and Land Fire Management Approaches

Since 2016, there have been a number of changes to forest and land fires management approaches, with these changes affecting all prevention and control activities. President Joko Widodo has reaffirmed Indonesia's commitment to preventing fires on an annual basis. Since 2016, the President called upon all elements of society to play a role in preventing forest and land fires through participation and support from many sectors related to forest and land fires, explicitly emphasizing the importance of effective early warning and prevention systems, improving support for systems of reward and punishment, improving law enforcement and synergies between central and local government agencies, improving synergies between all

stakeholders, increasing the effectiveness of forest and land governance, requiring compliance with obligations, and ensuring full participation at the community level. The President's personal affirmation of the importance of these issues has a significant influence on stakeholders and officials at all levels, from the central government level to the village level. As a result of this affirmation, even small uncontrolled fires are now considered a matter of urgent priority, requiring the involvement of ministries/institutions, village and regional governments, the Army, the police, the private sector, and the community at large.

As a result of its serious efforts in controlling forest and land fires, the Indonesian Government and the Ministry of Environment and Forestry have received international recognition. The Global Fire Monitoring Center (GFMC)

awarded the 2019 Global Landscape Fire Award, a token of appreciation for the hard work of the Indonesian Government and all stakeholders for their efforts to control forest and land fires in the aftermath of the 2015 catastrophic events. Indonesia was valued for its response to the 2015 smoke crisis, as well as its commitments to The Paris Agreement of 2015. The role of the Minister of Environment and Forestry of the Republic of Indonesia has also been appreciated. Minister Siti Nurbaya has shown the international community that the Republic of Indonesia is on the right path to reduce forest and land fires, and to implement good management of land and peat. These efforts have succeeded in carrying out various corrective measures to reduce the negative impacts of forest and land fires on the environment.

The focus of managing forest and land fires in 2020 consists of two programs: prevention of forest and land fire and controlling forest and land fire.

1. Prevention of Forest and Land Fires

a. Norms, Standards and Regulations

Regulations related to the prevention of forest and land fires issued between 2019 to 2020 include:

- Presidential Instructions on Forest and Land Fire have been issued every year since 2016. In February 2020, the President instructed the intensification of control of forest and land fires.⁴²
- Presidential Instruction No. 3 of 2020 concerning on Forest and Land Fire Control emphasizes the

role of different stakeholders in controlling forest and land fires according to their duties and functions, as well as what tasks should be prioritized.

- Geospatial Information Agency Decree No. 27 of 2019 appoints the Ministry of Environment and Forestry as the custodian of data related to forest and land fire prone areas.

b. Integrated Patrols

This program, established in 2016, has shown good results. In 2020, integrated patrols have been implemented in 1,200 villages in fire prone provinces (see Figure 3.14). These patrols conduct a number of activities, including monitoring to identify hotspots, ground checks, the extinguishing of fires, receiving reports of fire incidents, checking the availability of water to extinguish fires, mapping land that may have been subjected to fires, checking conditions that may create vulnerability to fire (scrub, etc.), and conducting awareness-raising activities. These integrated patrols appear to be an effective means of implementing early response activities at the ground level.

c. Forest and Land Fire Prevention Campaign

The purpose of this activity is to publish information and efforts related to prevention of forest and land fires that have been carried out by the Government of Indonesia, especially the Ministry of Environment and

⁴² Instruksi Presiden No. 3 Tahun 2020 tentang Pengendalian Kebakaran Hutan dan Lahan.

Forestry. Therefore, the public learns this information and is encouraged to be more actively involved in managing forest and land fires.

Indonesia has been trying to increase public awareness through various approaches, including online campaigns, religious media, as well as programs that directly touch communities and schools.

Prevention campaigns are also carried out through advertorials in printed newspapers, advertorials in printed magazine, public service announcements on television, internet and online news, public service announcements in public places, mass media campaigns, and radio and television talk shows. This campaign is also carried out through exhibitions at various events to promote forest and land fire control activities.

Fire Awareness and Direct Community Involvement aim to raise community awareness regarding forest and land fires, include the provision of counseling through social, religious and school forums, and also social media. It is hoped that the community's awareness of the importance of preventing forest and land fires will increase.

d. Weather Modification Technology

Weather Modification Technology (*Teknologi Modifikasi Cuaca*, TMC) is used for a variety of purposes, such as increasing and decreasing rainfall, snowfall, hail, and reducing fog. TMC which is carried out in Indonesia is used to fill reservoirs, rewetting peatlands, extinguish forest and land fires, and reduce rainfall that causes flooding. This activity is mainly carried out by seeding salt into clouds to induce rain.

Since 2020, TMC operations have been carried out routinely, further enhanced by involving more parties, namely the Ministry of Environment and Forestry together with TNI, BPPT, BNPB, and supported with data, climate and weather monitoring from the BMKG.

TMC activities are planned to continue in the future in areas that are determined, based on weather and technical considerations, to have higher potential for forest and land fires.

e. Forest and Land Fires Awareness and Community Involvement (MPA and MPA Paralegal)

Community empowerment programs are conducted to establish community awareness and involvement. The purpose of these programs is to increase community awareness, so that communities can be actively involved in forest and land fire suppression activities. There is also an effort to improve the ability and skills of communities to control forest and land fires, as well as to mitigate and adapt to climate change. Various stakeholders are involved in the program, including the central government, local governments and the private sector.

Among the activities are empowerment of fire-fighting units, promotion of fire-free villages, and the holding of community level livelihood improvement and training programs. A land preparation without burning (*Pengolahan Lahan Tanpa Bakar*, PLTB) program has also been implemented to encourage communities to engage in activities including composting, charcoal briquetting, vinegar

production and so on. Some other innovations that have been developed to support forests and land fires management include:

- In West Kalimantan, Manggala Agni is showing communities how to make wood vinegar, and use it as fertilizer. Also in West Kalimantan since 2019, the "Langit Biru" (blue sky) pilot project involves collaboration by Manggala Agni with the army to support villages to practice PLTB.
- Communities are encouraged to make charcoal briquettes from pieces of organic material such as wood, twigs, and sawdust - all residue from land clearing. The objective is for communities not to burn their land, and to instead use by-products from land clearing to make an abundantly available alternative energy source.
- Paludiculture is also encouraged as a technique for restoring degraded peat ecosystems. It entails the growing of non-timber forest products that emulate the ecology of peat forests.

As of mid-2020, Indonesia is trying to improve the MPA program by strengthening communities with burned forests and land through the program Legal Awareness of Community Development (Paralegal), hereinafter known as MPA Paralegal. This program aims to strengthen and empower communities by diversifying economic enterprises, according to the potential of each village area.

This activity is a collaboration between KLHK and BNPB, TNI, POLRI, Local Governments and other parties and has so far been carried out in 12 villages in the provinces of Riau, Jambi,

South Sumatra, Central Kalimantan, West Kalimantan, and West Java, where repeated fires occur every year due to fish drying by fishing communities and/or land burning by cultivators.

The program begins by providing training related to forest and land fire control, laws and regulations pertaining to the use of fire, and the potential for diversification of economic enterprises according to the particular resources of each village. Groups are then empowered to perform integrated patrols which ground-check hotspots, collect data on peat water levels, and perform early suppression of forest and land fires.

f. Improvement of Infrastructure for Forest and Land Fire Control

Improvements to forest and land fire control infrastructure are carried out regularly to increase the ability to control forest and land fires, considering that these facilities and infrastructure are vulnerable to damage due to frequent use. In addition, existing infrastructure, some of which was first built in 2002, needs to be replaced and rebuilt.

Since 2015, Indonesia has continued to revitalize facilities and infrastructure, including support infrastructure to control forest and land fires on peatland by blocking canals on peatlands, constructing reservoirs and ponds, and drilling boreholes, all to rewet peat and aid in fighting forest and land fires.

In addition, since 2019, the government and private sector have installed thermal CCTV to detect forest and land fires early.

INTEGRATED PATROLS

PREVENTION OF FOREST AND LAND FIRES



Post Number of villages where Forest and Land Patrol Posts have been established.

Coverage Number of villages covered by Forest and Land Patrol Posts

PREVENTION OF FOREST AND LAND FIRES

Saving Our Future



KEMENTERIAN LHK MANGGALA AGNI
 MINISTRY OF ENVIRONMENT AND FORESTRY
 DIRECTORATE GENERAL OF CLIMATE CHANGE
 DIRECTORATE OF FOREST AND LAND FIRE MANAGEMENT



SOURCE: KLHK, Data as of May 2020

► FIGURE 3.14 Integrated Patrols to control forest and land fires

g. Improvement of Capacity in Forest and Land Fire Management

Capacity Building and Improving Forest and Land Fire Control activities include the following: (i) building the capacities of Forest Management Units to control forest and land fires through the establishment of forest fire control brigades; (ii) development of the Indonesian National Qualification Framework and Competency Certification system to support the control of forest and land fires; and (iii) the provision of assistance and supervision to support the forest and land fire control activities of several private sector entities.

In 2017, Ministry of Environment and Forestry Regulation No. 47 of 2017 concerning the Indonesian National Qualification Framework and Competency Certification in the Field of Forest and Land Fire Control was issued. Based on this ministerial regulation, Indonesia is trying to improve the competence of forest and land fire control personnel, and help them meet expected standards.

h. Coordination and Cooperation in Controlling Forest and Land Fires

In controlling forest and land fires, planning, coordination and cooperation between parties is very important. This has been getting better over the years, resulting in a faster, more synchronized and targeted cooperation between agencies to control forest and land fires. Land Fire Management Planning is very important in forest and land fire control activities, and also contributes to monitoring the successes and failures of various programs. Planning is done regularly every five years,

as well as annually, in order to keep pace with recent conditions and technologies. Coordination and cooperation with various parties is needed to overcome forest and land fires, because it intersects with and addresses multi-sectoral interests and issues. At the national and local level, cooperation between parties had been resulted in new steps, such as weather modification technology, collaboration with the education sector, improvement of rural welfare, etc.

In the arena of international cooperation, Indonesia has formally ratified the ASEAN Agreement on Transboundary Haze Pollution (AATHP)⁴³. Since the ratification of this agreement, Indonesia is in a stronger position to engage with ASEAN on regional-level cooperation on matters related to the control of forest and land fires. Indonesia has offered to host the ASEAN Coordinating Center on Transboundary Haze Pollution (ACCTHP).

In the arena of bilateral collaboration, the Government of Indonesia dispatched a special task force to provide urgent assistance to support neighboring Australian forest and land firefighting teams in the Blue Mountain region of Australia's New South Wales Province in February 2020. At that time, Australia had been facing catastrophic forest and land fires, known there as "bushfires," since the third quarter of 2019. Bushfires are caused by a prolonged dry season accompanied by extreme hot weather. Australia's most recent spate of bushfires left more than 7.7 million

hectares of land burned, killed 33 people, temporarily or permanently displaced thousands more, and resulted in the destruction of more than 2,000 buildings.

Because the Australian Government was having a difficult time as a result of this incident, and in further view of the fact that, on several occasions, the Australian Government has played an active role in providing assistance in the face of natural disasters in Indonesia, the Government of Indonesia, through BNPB financing, was pleased to undertake this humane mission to support the Australian Government in post-fire management in the Blue Mountains from 30 January to 7 March 2020.

Both TNI and BNPB personnel were dispatched. A total of 38 individuals were sent, consisting of 26 Platoon Level (SST) Military Engineers, six Marines, four Army Construction Facility personnel and two TNI Health Center personnel.

It is hoped that the humanitarian assistance provided by Indonesia not only helped to provide relief to Australia from this disaster, but has also served to strengthen bilateral relations and between the two countries going forward.

2. Control of Forest and Land Fires

a. Early Warning and Detection

Systems for early warning and detection have been developed and include the daily monitoring of data derived from Indonesia's Fire Danger Rating System (FDRS, *Sistem Peringkat Bahaya Kebakaran*, SPBK), hotspot data, weather, as well as actual incidents and activities that have the potential to cause forest and land fires. Also important is the monitoring of peat water levels. To monitor data related to hotspots, a range of institutions have been involved in developing warning and early detection products. Since 2016, following the issuance of a circular letter by the Minister of Environment and Forestry, it has been agreed to use data from the Indonesian National Institute of Aeronautics and Space (*Lembaga Penerbangan dan Antariksa Nasional*, LAPAN) to identify hotspots and to disseminate this data to the relevant government agencies, including the Ministry of Environment and Forestry (KLHK), BMKG, BNPB, and the Geospatial Information Agency (*Badan Informasi Geospasial*, BIG), with the KLHK appointed as data custodian.

⁴³ Undang-Undang Republik Indonesia No. 26 Tahun 2014 tentang Pengesahan ASEAN Agreement on Transboundary Haze Pollution (Persetujuan ASEAN tentang Pencemaran Asap Lintas Batas).

b. Fire Suppression

Suppression is the last resort to overcome forest and land fires, and responding early is crucial in this regard. An early response is only possible with robust early warning and detection activities. These activities may include routine land and air patrols, integrated patrols, hotspot ground checks and/or activities to extinguish small fires. Patrols are regularly conducted across the nation to check areas particularly prone to forest and land fires and to rapidly identify cases that require further action.

Fires are always handled as early as possible, with the most effective methods available. Ground suppression and water bombing, or a combination of the two, are used.

In general, suppression methods in Indonesia differ between those used in peatland fires and those used in fires atop mineral soils. Suppression in peatlands is more difficult because the origin of the fire can typically not be seen visually, generates a lot of smoke and requires more resources and time to handle, and also requires separate specifications such as injection of water into peat. The latter is a tool invented by forest and land fire-fighting personnel in Indonesia, and in recent years it now being mass-produced by several private companies in Indonesia. This tool has a unique shape similar to a large syringe connected to a hose, and is used to inject water deep into peat soil. It is highly effective in putting out fires in peat swamp areas, where the flames are not only found on the surface, but also in peat soils deep underground. A meter of galvanized pipe with an end almost as sharp as a needle is injected into peat soil. The

hole is drilled vertically at first, and later horizontally, to allow water to be distributed underground.

c. Evacuation, Post-Fire Management, and Law Enforcement

It is important to carry out rescue and evacuation activities in controlling forest and land fires. Authorized officers to carry out rescue and evacuation when there is danger due to forest and land fires, both danger experienced by the official personnel, and danger that threatens communities.

Post-forest and land fire management is important because it identifies the causes of, and the damage caused by, forest and land fires. Post-fire management involves activities such as collecting data and information, monitoring areas affected by fires; putting out any remaining fires, mapping affected areas; rehabilitating affected areas; and the enforcement of law through the imposition of administrative, civil, and/or criminal sanctions against individuals and/or corporate entities that have engaged in violations that have led to fires.

New methods of calculating the area of forest and land fires by Indonesia have resulted in important changes. In the past, Indonesia only relied on reports of forest and land fire incidents from the regions. Since 2015, Indonesia has implemented more comprehensive and precise methods of calculating the area of forest and land fires by using mapping methods and satellite imagery to overlay hotspot data, and coordinates from fire suppression activities and field checks.

These overlays are very helpful in optimizing planning, monitoring, field operations and law enforcement.

3.5.2 The Focus of Forest and Land Fire Control

Forest and land fire control activities that will be important areas of focus for Indonesia in the future are:

- Prioritizing the prevention of forest and land fires
- Increasing the active participation of business actors in the field of agriculture, industrial timber plantations and mining, with respect to their impact on forest and land fires
- More independent patrols and integrated patrols, especially in fire prone provinces in Indonesia
- Increasing community awareness of and participation in forest fire control, through campaigns and publications, online media and social media, and collaboration with educational institutions, religious groups and social groups.
- Encouraging Provincial/District/City Governments to allocate budgets for, and optimize the use of DBH-DR (local shares of reforestation fund) for, faster forest and land fire alert systems, so that forest and land fire control is more optimal.
- Strengthening the capacity of Manggala Agni and enhancing the role of MPA as forest and land firefighters.
- Increased technological capacity for early warning and early detection of forest and land fires.
- More community and civil society monitoring and online reporting at <http://sipongi.menlhk.go.id> on the activities of business actors in the forestry and plantation sector.

3.6 Climate Change

Indonesia is a significant contributor to greenhouse gas emissions. At the same time, because of its geographical location, Indonesia is particularly vulnerable to the impacts of climate change. Climate change is a global challenge, and it is not possible for Indonesia to face it alone. Therefore, Indonesia plays an active role in forums to foster global cooperation to address this issue, under the UNFCCC and other fora associated with climate change issues.

At the institutional level, the management of issues related to climate change, including both participation in international forums and domestic implementation, fall under the mandate of the Ministry of Environment and Forestry. This ministry represents a merger of four previously separate units, these being the Ministry of Environment, the Ministry of Forestry, the National Council on Climate Change (*Dewan Nasional Perubahan Iklim*, DNPI), and the Agency for Reducing Emissions from Deforestation and Forest Degradation (*Badan Pengelola Penurunan Emisi Gas Rumah Kaca dari Deforestasi, Degradasi Hutan dan Lahan Gambut*, BP REDD+).⁴⁴

3.6.1 The Nationally Determined Contribution of the Forestry Sector

Nationally Determined Contribution (NDC) is the heart of the Paris Agreement reached at the COP 21 of the UNFCCC. NDC is an embodiment of each country's efforts to reduce emissions and adapt to the effects of climate change.

The First NDC of Indonesia was submitted to UNFCCC in November 2016. The document was prepared by coordination and collaboration of the line Ministries and Institutions most

⁴⁴ Peraturan Presiden Republik Indonesia No. 16 Tahun 2015 tentang Kementerian Lingkungan Hidup dan Kehutanan.

responsible for implementing climate change mitigation activities, and set targets for GHG emission reduction by 2030 in five sectors, notably, forestry, energy, waste, *Industrial Processes and Product Use* (IPPU), and agriculture. Meanwhile, the Indonesia's climate change adaptation goals are to reduce risks of climate change on all development sectors (agriculture, water, energy security, forestry, maritime and fisheries, health, public services, infrastructure, and urban systems) by 2030 through local capacity strengthening, improved knowledge management, convergent policy on climate change adaptation and disaster risk reduction, and application of adaptive technology. The NDC aims at communicating Indonesia's commitment to deal with climate change. The NDC is tracked and reported as verified in a Biennial Transparency Report, BTR.

Indonesia's NDC committed to reduce GHG emissions by 29 percent through its own efforts (unconditional) and by up to 41 percent if provided with the necessary amounts of international assistance (conditional) and helping to reducing the risk of climate change by 2030. These reductions are slated to take place over the period of 2020 to 2030, as measured against a 2010 'business as usual' baseline. The most significant reductions will be achieved in the forestry sector, with its reductions contributing 17.2 percent of the nation's 29 percent in unconditional reductions, and 23 percent of the 41 percent in conditional reductions. The forestry sector contributions will be followed by those from the energy sector, which will achieve reductions of 11 percent and 14 percent, respectively. The Government has also established targets to reduce emissions for the waste management, IPPU, and agricultural sectors.⁴⁵ These targets will be achieved through the implementation of mitigation and adaptation measures specifically designed for each sector, with measures including improved forest and land fire management; waste segregation measures; the promotion of environmentally friendly transportation; and low emission water management in agriculture.

The deforestation rate envisioned under Indonesia's business as usual (BAU) scenario for 2013-2020 is in line with its Forest Reference Emission Level (FREL) for REDD+, which is about 920,000 hectares per year of planned and unplanned deforestation. To lower the rate of deforestation below BAU levels, Indonesia sought to limit deforestation between 2013 to 2020 to an average of 450,000 hectares per year. As shown in Figure 3.2, planned and unplanned deforestation during four of the first six years of this period (2013 to 2018) came close to this level. However, for two of these years, deforestation exceeded this level. Therefore, annual deforestation averaged 580,000 hectares per year for that six-year period. In the coming decade (2021 to 2030), the forecasted average BAU rate of planned and unplanned deforestation is 820,000 hectares per year. Indonesia aims to lower the rate of deforestation to an average of 325,000 hectares per year during the coming decade.⁴⁶

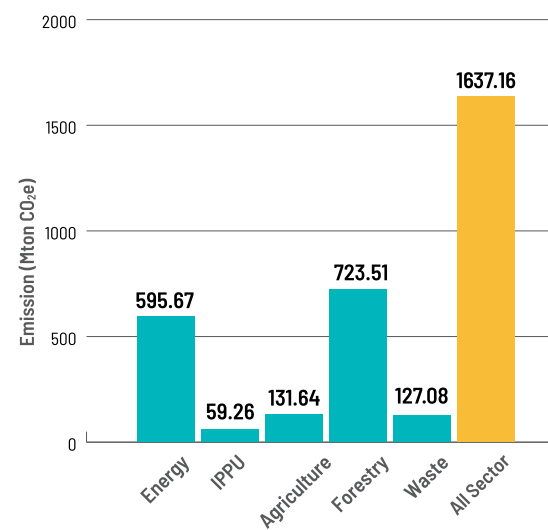
3.6.2 Greenhouse Gas Emissions

3.6.2.1. National Greenhouse Gas Inventory

a. Emissions from All Sectors

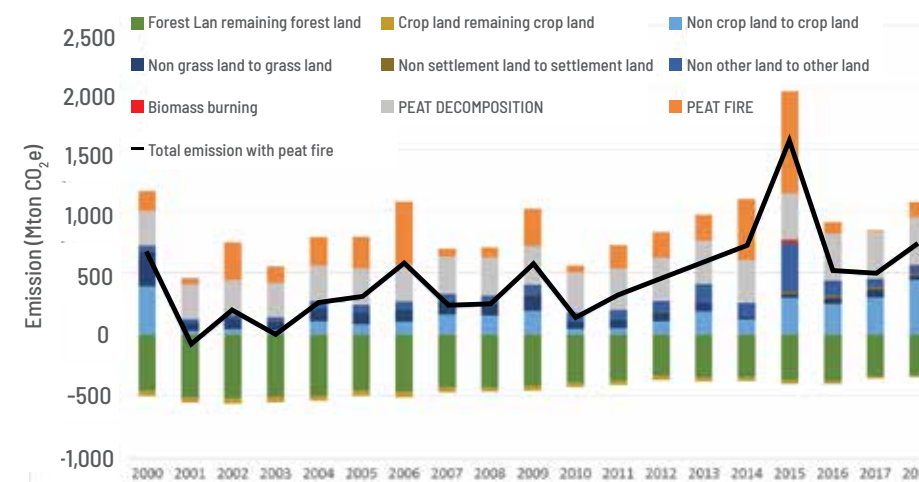
Indonesia publishes a yearly report on its National Greenhouse Gas emissions. The report presents verified data and information related to the profile of the nation's GHG emissions and achievement of GHG emission reductions. The report follows IPCC guidelines for estimating GHG emissions and reductions, and includes information from five sectors, notably forestry and other land-use, energy, waste, IPPU and agriculture. As of the end 2018, the following information was presented:

- Based on the NDC, the baseline emission value in 2018 was 1.86 Gton CO₂e;
- Actual emissions in 2018 were 1.64 Gton CO₂e (see Figure 3.15);
- Emissions in 2018 were 226 million tons of CO₂e below the 2018 baseline.



SOURCE: KLHK, 2020d.

► FIGURE 3.15 Profile of national greenhouse gas emission 2018



SOURCE: KLHK, 2020d.

► FIGURE 3.16 National emissions from forestry sector and peatlands in 2000 - 2018

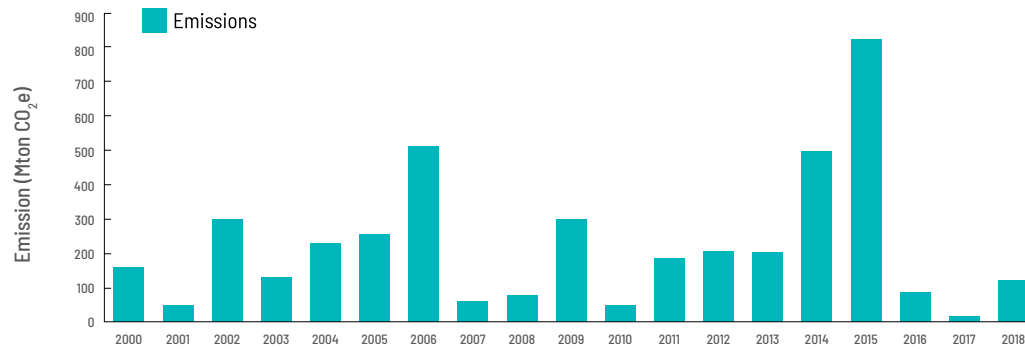
b. Emissions from the Forestry Sector and Peatlands

In the specific case of emissions from the forestry sector and peatlands, for the period from 2000 to 2018, the average annual level of emissions stood at 439.8 Mton CO₂e per year. Excluding emissions from peat fires, the average annual level of forestry and peat sector emissions was 213.95 Mton CO₂e.

Figure 3.16 shows the emission levels of the forestry sector and peatlands. The implementation of mitigation measures has resulted in a reduction in the level of emissions, particularly in the case of emissions from peat fires. Post El Nino in 2016, the level of emissions from peat fires declined to 90.27 Mton CO₂e, from the figure of 822.7 Mton CO₂e as recorded in 2015. In 2017, the level of emissions from peat fires fell further, to 12.5 Mton CO₂e. But in 2018, the level of emissions from peat fire increased to 121.32 Mton CO₂e (see Figure 3.17).

⁴⁵ Republic of Indonesia. 2016. First Nationally Determined Contribution of Republic of Indonesia.

⁴⁶ Republic of Indonesia. 2016. First Nationally Determined Contribution of Republic of Indonesia



Note: Extensive forest fire occurred in 2015 affecting 891,275 hectares.

SOURCE: KLHK, 2020d.

► FIGURE 3.17 Emissions from peatland fires in the period of 2000 to 2018

3.6.2.2. Achievement in Reducing GHG Emissions Against the NDC Target

a. Achievement by All Sectors

Indonesia's emissions in 2018 were of 1,637 Mton CO₂e, which comes in below 2016's baseline emission level. It is equivalent to 7.85 percent against the target of 29 percent in 2030 (see Table 3.4).

► TABLE 3.4 Contribution of GHG emission reduction to NDC target in 2010 - 2018

	GHG Emission (Mton CO ₂ e)								
	2010	2011	2012	2013	2014	2015	2016	2017	2018
Baseline (BAU)	1,334	1,520	1,569	1,611	1,671	1,702	1,769	1,860	1,863
Inventory	810	1,054	1,245	1,331	1,509	2,374	1,336	1,354	1,637
Emission Reduction per year	524	466	325	280	162	-672	433	507	226
2030 NDC Contribution (%)	18.22	16.20	11.29	9.73	5.63	-23.37	15.07	17.62	7.85

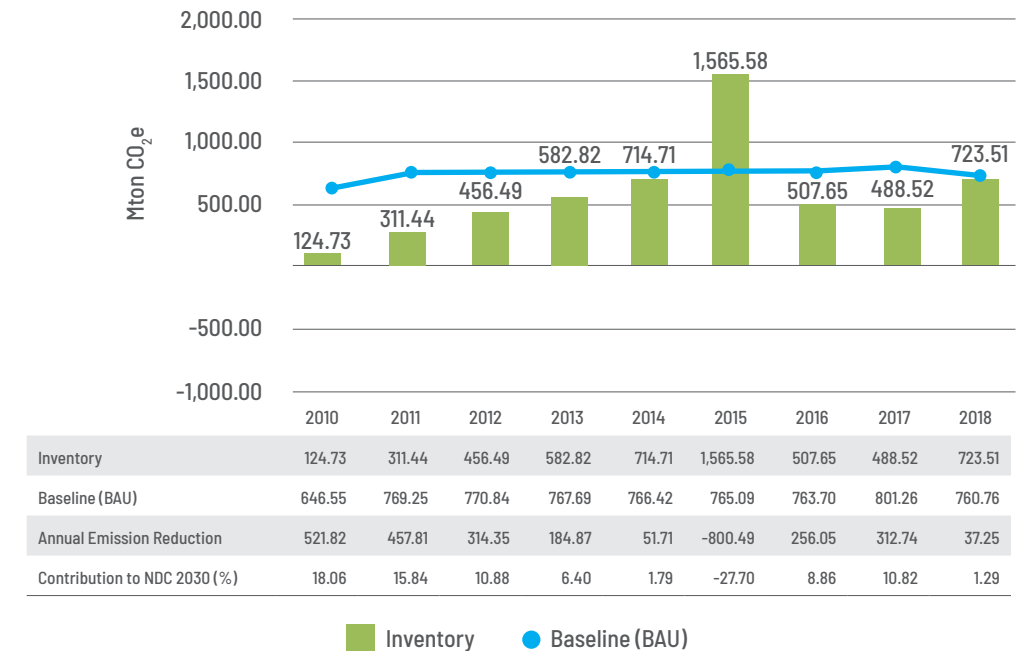
SOURCE: KLHK, 2020d.

b. Achievement of Forestry and Other Land Use Sector

According to the NDC, the unconditional 2030 target for the forestry sector is to reduce GHG emission by 17.2 percent (497 Mton CO₂e). Based on the 2018 GHG inventory, the forestry sector GHG emissions amounted to 724 Mton CO₂e, while the NDC baseline (BAU) emissions for the forestry sector in 2018 was 761 Mton CO₂e. This means the 2018 achievement of GHG

emissions reduction in the forestry sector against the baseline was only 37 Mton CO₂e.

Setting the forestry sector's 2018 emissions reductions against the NDC's hoped for annual reduction (17.2 percent), the forestry sector fell far short in 2018, achieving only 1.29 percent (see Figure 3.18). The forestry sector's emissions reductions in 2018 were far lower than in 2017, because of an increase in forest and peatland fires in 2018.



SOURCE: KLHK, 2020d.

► FIGURE 3.18 Comparison of forestry sector GHG inventory results with forestry sector emission BAU in 2010 - 2018

3.6.3 REDD+: a Strategy to Achieve the NDC Target from the Forestry Sector

REDD+ is a policy that provides national scale positive incentives to achieve forest and land use GHG emissions reductions with a phased approach. REDD+ in Indonesia is a national program built on sub national implementation in three phases – readiness, transition, and full implementation with result-based payments.

Measures to reduce emissions resulting from deforestation and forest degradation are subsumed under the REDD+ program, which holds the promise for particularly significant mitigation measures in the forestry sector. The REDD+ program promotes policy approaches and incentive mechanisms to: reduce the level of emissions as well as risk of climate change from deforestation and the degradation of forests; intensify the role of conservation of carbon stocks; increase sustainable forest management; increase carbon stocks. A national MRV system for REDD+, supported by the National Forest Monitoring System (NFMS), has been developed and undertaken to support climate change adaptation and mitigation, and is committed to presenting this information in a way that is transparent and understandable.

The development of National Registry System on Climate Change aims to prevent duplication of efforts, overlaps in reporting, double-reporting and double-counting, as well as to synchronize, climate change adaptation and mitigation. The system is intended to register and acknowledge all actions taken by all stakeholders to reduce CO₂ emissions. Other than reducing emissions, REDD+ in Indonesia has also contributed to sustainable forest management, for example, by establishing the NFMS.

REDD+ activities are planned and conceived at the national level but implemented at the sub-national level. Although REDD+ is implemented at the sub-national level, the level of reduction of GHG emission is calculated at the national level, in order to determine the overall success of the program. Sub-national FRELs have been calculated and stipulated through a decree issued by Directorate General of Climate Change on Stipulation of Sub-national (Provincial) Forest Reference Emission Levels (Decree No. 8/PPI/IGAS/PPI.2/3/2019). This decree functions as a reference to calculate GHG emission reductions and/or increases to carbon stock at the provincial level, and a reference to enable sub-national entities to formulate action plans within the REDD+ framework in their respective jurisdictions. Sub-national FREL are derived from the national FREL, with the accumulated total of sub-national FRELs not exceeding the quoted defined by the national FREL quota.

Indonesia underwent a Technical Assessment process for the 1st FREL document for 10 months in 2016 and passed with the issuance of a Report on the Technical Assessment of the Proposed FREL of Indonesia by the UNFCCC Secretariat. Thus, the FREL document officially becomes the reference level for emissions for the forestry sector, and marks the start of the full implementation phase of REDD+ in Indonesia. Indonesia cut its emissions by 48,978,427 tCO₂e annually (average of annual emissions reductions) and 244,892,135 tCO₂e cumulatively, as a result of reductions in deforestation and forest degradation between 2013 and 2017, calculated against the 1990 to 2012 baseline emissions in the 1st FREL document. The results achieved by Indonesia from reducing emissions from deforestation and forest degradation for REDD+ in 2013 to 2017 were submitted

to the UNFCCC Secretariat in the technical annex to the 2nd Biennial Update Report (BUR) of Indonesia and underwent Technical Analysis by the UNFCCC Secretariat in 2019.

Regarding results-based payments (RBP) for REDD+, Indonesia has made significant progress. This is indicated by the approval of the Indonesia REDD+ RBP proposal in the framework of the Green Climate Fund (GCF) and the Indonesia-Norway Partnership in 2020. Within the framework of the GCF REDD+ RBP, part of the achievements of Indonesia's emissions reduction for the 2013 to 2017 period was proposed for RBP-GCF piloting in the amount of nine Mton CO₂e per year for three years (2014-2016), so that the emission reduction proposed for the three years was 27 Mton CO₂e. Based on the results of the GCF Independent Technical Advisory Panel (ITAP) assessment, Indonesia obtained a total score of 36 out of a maximum score of 48 (75 percent), thus obtaining payment from GCF for emission reductions of 20.25 Mton CO₂e with an additional 2.5 percent surplus payment for non-carbon benefits.

Meanwhile, in the framework of the Indonesia – Norway Partnership, in 2017 Indonesia reduced emissions by 17.28 Mton CO₂e, in relation to avoided deforestation and avoided forest degradation (see Table 3.5 and Figure 3.19). Avoided deforestation emissions from 2016 to 2017 amounted to 8.6 Mton CO₂e (3.6 percent below the baseline), while reductions in emissions from forest degradation amounted to 8.68 Mton CO₂e (21.2 percent below the baseline)⁴⁷.

For REDD+ Implementation, the Ministry of Environment and Forestry has developed and improved its REDD+ infrastructure, including: updating the NFMS; updating the forest carbon stock database (to include the strengthening of the National Forest Inventory/NFI); and establishing the National Registry System for Climate Change. In addition, the REDD+ Safeguards Information System (SISREDD+) was established, has been mainstreamed, and is currently in use at the sub-national level. The REDD+ National Registry System has also been integrated with SISREDD+ to ensure synchronized reporting on safeguards implementation

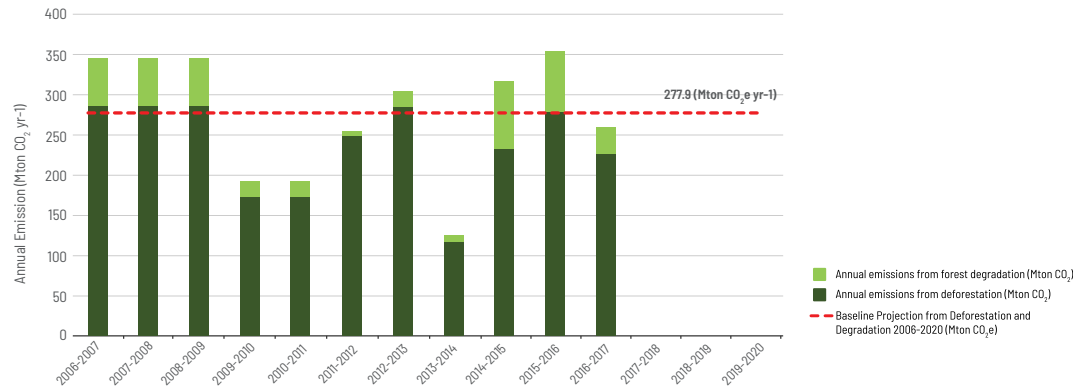
⁴⁷ MoEF, 2020.

► TABLE 3.5 Emission reduction from avoided deforestation and forest degradation in 2016 - 2017

Activity	Emission Reduction (tCO ₂ e)	Percentage from Baseline (%)
Deforestation	8,597,888	3.60%
Forest Degradation	8,680,457	21.20%
Total Emission Reduction	17,278,345	24.80%

Note: Data 2016-2017 refer to baseline data 2006/2007

SOURCE: MoEF, 2020



SOURCE: MoEF, 2020

► FIGURE 3.19 Annual emissions from deforestation and forest degradation

and emissions reduction achievements at the sub-national level. Furthermore, Indonesia has also developed the Indonesian Emission Factor Data Base (EFDB); updating the methodology for calculating data on activities related to emissions to reduce the level of uncertainty; and including three REDD+ activities in future FREL submissions. To improve the policy framework, a number of policies have been formulated and implemented, including the One Map policy; the moratorium on the issuance of new concessions in certain natural forests and peatlands; an incentive system related to FLEGT licenses to ensure the legality of timber; measures to build capacity to manage and restore peat ecosystems; and policies related to social forestry. A ministerial regulation related to REDD+ implementation has been issued, together with a national regulation for climate financing.

Progress on the National Forest Reference Emission Level (FREL):

a. FREL is a benchmark or reference emission level to measure the country's performance in efforts to reduce forest-related GHG emissions. FREL is characterized by principles of transparency, accuracy, consistency, is complete and comprehensive, and is in line with COP decisions.

b. Indonesia's First National FREL was submitted in 2016 to the UNFCCC and a technical assessment was carried out by the UNFCCC Secretariat. Indonesia's first FREL was declared compliant with TACCC rules as a form of MRV and is suitable to be used as the basis for the Result-Based Payments, RBP. Documents on the results of the technical assessment by the UNFCCC secretariat can be downloaded at: <http://unfccc.int/resource/docs/2016/tar/idn.pdf>. The revised first FREL document based on the results of the technical assessment can be downloaded at: https://redd.unfccc.int/files/frel_submission_by__indonesia_final.pdf.

c. Indonesia's first FREL has a validity period for the period 2013-2020

d. The Directorate General of Climate Change in the Ministry of Environment and Forestry has begun to compile the Second National FREL, and plans to submit it to the UNFCCC in early 2021. The preparation of the second FREL was compiled through improvements based on the results of the first FREL technical assessment and the revised first FREL document.

e. The second FREL:

- Uses reference periods with ranges of 10-15 years

- Increases its scope to include: (1) deforestation, (2) forest degradation, (3) peat decomposition of areas subject to deforestation and forest degradation, (4) peat fire, (5) mangrove soil carbon, and (6) enhancement of carbon stock
 - Adds as carbon pools: Above Ground Biomass (AGB), Below Ground Biomass (BGB), dead wood, soil organic matter (peat and mangrove)
 - Has improved activity data and emission factors
 - Has an improved uncertainty assessment
- f. If accepted by the UNFCCC, the 2nd National FREL will have a validity period for the years 2021 - 2030.

Emerging from these efforts, the Indonesian National Accounting Carbon System (INCAS) has been invented to support the Indonesian Government in its commitment to reduce emissions. The system has been tested by experts and has met standard of Transparency, Accuracy, Completeness, Comparability, and Consistency (TACCC). INCAS accommodates carbon emissions information on all forests and peatlands in all provinces in Indonesia. In dealing with climate change, every country is required to reduce greenhouse gas emissions. So is Indonesia. Because INCAS can calculate carbon emissions and stocks in Indonesia, it has become a national platform to support the commitment to reduce carbon emissions.

INCAS provides information on carbon emissions in all 34 provinces, including carbon sequestration and carbon stock information from forest and land activities. It calculates emission and biological oxidation from land fires on both mineral and peat soils, includes data and information on fires, including the location

and severity of burnt areas. This and other innovations in INCAS were developed by FORDA, and will contribute to the sophistication of Indonesia's national MRV (Measuring, Reporting and Verification) system.

3.6.3.1 REDD+ Funding Instruments

The Indonesian Government has established the Environmental Fund Management Agency (*Badan Pengelola Dana Lingkungan Hidup*, BPD LH). BPD LH is a public service agency (*Badan Layanan Umum*, BLU) that is accountable to and structurally operationalized under the Minister of Finance of the Republic of Indonesia. BPD LH has legal flexibility and an autonomous authority to manage its operations in bringing together environmental funding mechanisms for channeling and distributing environmental and climate funds. BPD LH is overseen by a Steering Committee (SC) which is responsible for formulating general and technical policies, including asset allocation and overall evaluation. The SC is the highest-level governance body in the BPD LH, chaired by the Coordinating Minister for Economic, and members consists of line ministers, i.e. Minister of Environment and Forestry, Minister for National Development Planning Agency (BAPPENAS), Minister of Energy and Mineral Resources, Minister of Industry, and Minister of Agriculture.

Pursuant to Act No. 32 of 2009 on Environmental Protection, the government has issued Government Regulation No. 46/ 2017 on Economic Instruments for the Environment. This regulation states that an environmental degradation/ pollutant

fund and conservation grant fund will be managed by central government using a BLU. This regulation, in turn, is now serving as the basis for the establishment of the Environmental Fund Management Agency (BPDH). Presidential Regulation No. 77 of 2018 on Environmental Fund Management was subsequently issued, and the organization of BPDH has been further regulated through Ministry of Finance Regulation No. 137 of 2019. The BPDH was launched on October 9, 2019 by the Minister of Finance, the Minister of Environment and Forestry and the Coordinating Minister for Economic Affairs. Figure 3.20 shows the milestones of the BPDH's establishment and operation.

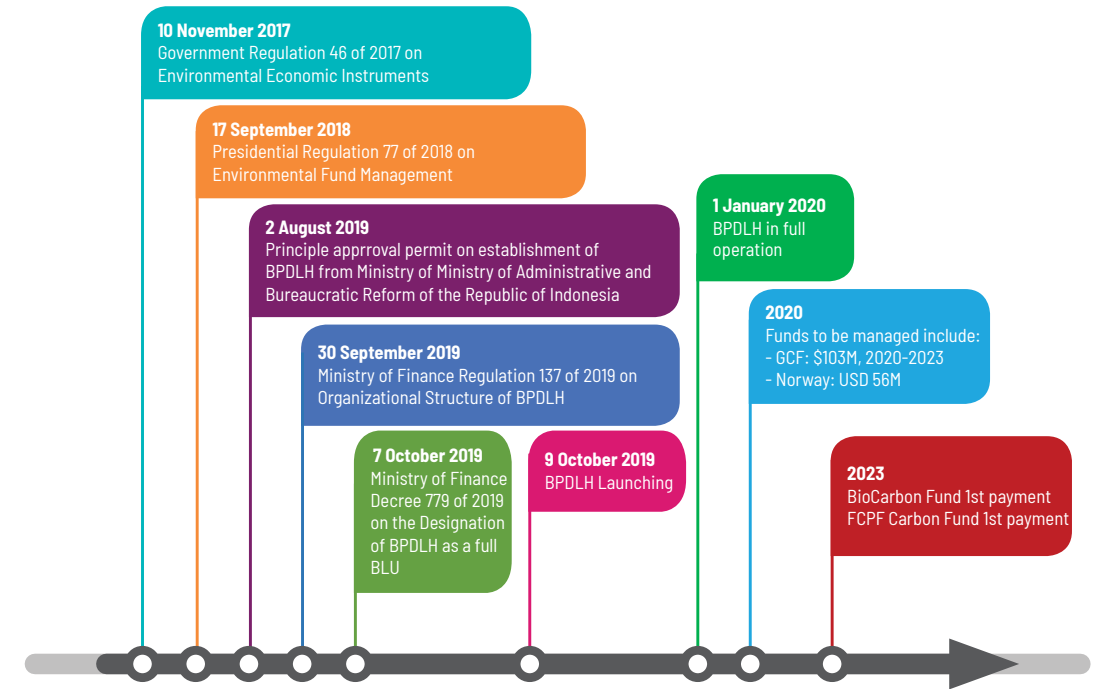
The objective of the establishment of BPDH is primarily to manage and mobilize environmental funds from various sources, such as the multilateral and bilateral foreign assistance communities ("donors"), the private sector, and others. BPDH is expected to adopt international standards with respect to revenue and fund management, and the distribution of funds obtained from various parties including communities, businesses, international agencies, foreign governments, local governments and the central government. The BPDH will employ an asset management principle that separates assets from the fund manager (BPDH) by utilizing a custodian bank as a trustee, all in the interest of accountability.

BPDH carries out the function of managing environmental funds to ensure a sustainable environmental protection and management program, including a climate change control program. Fund management through BPDH is expected to accelerate efforts to preserve and protect the

environment by providing easy access to funding and ensuring the sustainability of the availability of funds for various parties, not only for the government alone. BPDH carries out the main functions of collecting, fostering and channeling funds related to the environment in a transparent, accountable and international standard manner. This body will run a flexible scheme in accordance with the mandate of the law and the funders, while still observing the rules of the applicable laws and regulations. Fund distribution by the BPDH will be based on criteria and indicators determined by the BPDH, by associated ministries and in consultation with potential donors. The funds could be distributed through different schemes, such as grants, loans, result based payments, a domestic carbon market, and other legal mechanisms. The BPDH will have several funding windows to cater to different purposes such as nature conservation, climate change, and addressing environmental degradation. One of the initial funds that will be managed by BPDH is the REDD+ fund. Management of REDD+ funds will be under the climate change control window as stated in the Minister of Environment and Forestry Regulation No. 70/2017 concerning the procedures for implementing REDD+.

As stated in article 5 of the Paris Agreement, results-based payments for REDD + activities are based on verified reduced emissions. Some potential REDD+ results-based payment mechanism to be managed by BPDH include:

- a. REDD+ Funds within the framework of cooperation between Indonesia and Norway:
As stated in the Indonesia Norway Cooperation Letter of Intent,



► FIGURE 3.20 Milestones of Environmental Fund Management Agency (BPDH) establishment and operation

Norway will provide payments to reduced emissions through REDD+ activities of up to USD 800 million. The payments will be made between 2020 and 2030. At present Indonesia has completed an assessment of the 2016 to 2017 emission reduction results and it is expected that payment will be made by Norway in the near future.

- b. Green Climate Fund (GCF) REDD+ Result Based Payment Project: Indonesia has received approval from GCF for its request for result-based payments for reducing emissions through REDD+ activities between 2014 to 2016. Funds received by Indonesia from this request are expected to be USD 103 million. These funds will be used by Indonesia from 2020 to 2023.
- c. Forest Carbon Partnership Facilities (FCPF Carbon Fund):

The Indonesian Government participates in the FCPF's Carbon Fund program in collaboration with the World Bank. Results-based payment are intended for REDD+ pilot activities in East Kalimantan Province which will be carried out from 2020 to 2024. The potential funding that can be received is USD 110 million.

- d. Bio Carbon Fund Initiative for Sustainable Forest Landscapes (BioCF ISFL): Similar to activities in the Province of East Kalimantan, the Indonesian government is also aiming to access BioCF ISFL funding for REDD+ pilot activities in Jambi province. There, REDD+ result-based payment will be made in amounts up to USD 70 million, if emissions can be shown to have been reduced over the period of 2021 to 2030.

3.6.4 Updated NDC

In accordance to the mandate of Decision 1/CP21 of Paris Agreement, paragraph 24 and 25, Indonesia is in the process of updating its NDC, with a view to facilitating the clarity, transparency and understanding of these contributions. Public consultations to compile an 'Updated NDC' document were held by Ministry of Environment and Forestry on 12 and 18 February 2020. The consultations aimed at obtaining input from experts and stakeholders, to produce a concise 'Updated NDC' narrative that is both flexible but also accountable. New commitments agreed from the consultations are:

- a. that the 'Updated NDC' be executable, and not only an action or activity plan;
- b. that its actions or activities be sanctioned through legislation, in order to guarantee implementation;
- c. that the 'Updated NDC' be sustainable, and have a long-term time frame
- d. that it has supporting infrastructure, implementation tools, better data and information, achievement tracking, better reporting, and verification of commitments.

One of the agendas in the public consultation was the submission of views from experts related to the Paris Agreement mandate, and preparations for the Katowice Package. Focus Group Discussions on the adaptation and mitigation elements of the 'Updated NDC' concluded that:

- a. GHG emissions reduction targets of 29 percent and 41 percent would not be revised, taking into account that the unconditional 29 percent

target is already very ambitious, given the still large challenges to meet the conditions that must be achieved, for example:

- (1) a deforestation rate averaging only 325,000 hectares per year between 2021 and 2030
- (2) a reforestation target of 800,000 hectares per year with survival rates of 90 percent;
- (3) fulfilment of the commitment for a 23 percent renewable energy mix by 2025;
- (4) the implementation of clean coal technology (CCT) in 75 percent of all coal power stations, and
- (5) the implementation of waste to energy power plants in seven cities.

- b. Information needs to be updated in accordance with current conditions, for example, the vision and mission laid out by the Indonesia Maju 2019 Cabinet;
- c. More detailed information is needed, for example, in relation to the elements of the adaptation roadmap, means of implementation for all elements of the NDC, and a transparency framework. With particular respect to adaptation, a roadmap is being formulated that includes regulation and instrument modalities, such as guidelines for assessment of vulnerability, risk and the impact of climate change (based on KLHK Ministerial Decree No. P-7/2018); developing an action plan for adaptation (based on Ministerial Decree No.P-33/2016); and monitoring and evaluating climate actions (based on Ministerial Decree No.P-72/2017); as well as an online platform known as SIDIK (www.sidik.menlhk.go.id), in relation to which, see Box 3.7 below.

- d. Deliver commitments (new, if available) related, for example, to oceans in the adaptation element.
- e. Make sure the 'Updated NDC' is concise, and flexible but still accountable.

3.6.5 Climate Change Adaptation

Climate change impacts directly or indirectly upon the national economy, especially in relation to the fulfillment of basic needs such as food, water, energy, and health. A 2009 Asian Development Bank (ADB) study estimates that Indonesia's GDP in 2100 will be 2.2 percent to 5.7 percent lower than what it would have been, absent the effects of climate change. Losses to the agriculture and fisheries sectors due to climate change in 2100 will account for 2.2 percent of that loss, while the increase of climate related disasters will contribute 0.3 percent of that loss.⁴⁸ Bappenas, in its review of the National Action Plan on Climate Change Adaptation (RAN-API), found that the potential economic losses to economic growth from the impact of climate change on four priority sectors -- marine & coastal, water, agriculture, and health -- IDR 115.53 trillion of Indonesia's GDP in 2024. Meanwhile, the government will aggressively pursue mitigation and adaptation measures in order to avoid a climate change-driven reduction in GDP of 2.87 percent in the year 2030, which is predicted by the NDC's 2020 Roadmap to be likely, in the event that such measures are not taken.

A decrease in rainfall, higher temperatures, and a loss in forest cover reduce the availability of fresh water. Lower rainfall and higher temperatures

also increase evaporation, which in turn reduces water reserves in the soil, resulting in a decrease in the number of springs and a gradual drying up of watersheds. For instance, the number of springs on Mount Rinjani declined by 50 percent in a period of around 27 years. The number of springs in West Nusa Tenggara Province also declined by about 75 percent, from 702 springs in 1980 to 180 springs in 2006/2007⁴⁹.

Forests and climate change adaptation have two interactions that affect each other. First, because forests are vulnerable to climate change, those who manage or protect them must adjust their management approaches to the projected future conditions. The people who live around the forest are very dependent on the products and services provided by the forest. They are vulnerable to forest changes both socially and economically. Second, forests provide ecosystem services that are important to humans. Because these ecosystem services contribute to reducing people's vulnerability to climate change, conservation or management of tropical forests must be included in adaptation policies.

The Indonesian Government has committed to mainstreaming the SDGs, including climate change adaptation, into the nation's development planning. The National Medium-Term Development Plan (RPJMN) for 2020 to 2024 includes adaptation under its sixth development agenda ("Environmental development and enhancing resilience to disaster and climate change"), focusing on water, agriculture, health, and coastal and marine ecosystems. This is in line with Indonesia's first NDC. The goal of Indonesia's climate change adaptation is to reduce risks, enhance adaptive capacity, strengthen

⁴⁸ ADB, 2009.

⁴⁹ KLHK, 2017d.

resilience, and reduce vulnerability to climate change in all development sectors. This goal will be achieved through, among other things, enhanced climate literacy, local capacity strengthening, improved knowledge management, convergent policy on climate change adaptation and disaster risks reduction, and application of adaptive technology. In achieving adaptation, Indonesia focuses on three areas of resilience, namely: economic resilience, social and livelihood resilience, and ecosystem and landscape resilience⁵⁰.

Indonesia's 'Updated NDC' elaborates on adaptation even more, as sets a vision for a long term strategy of climate resilient development. Key programs, strategies, and actions for each area of resilience have been identified. In general, the key programs, strategies, and actions on adaptation aim at:

- reducing drivers of vulnerability to climate change,
- responding to climate change impacts and managing risks,
- enhancing capacity of communities and sustainability of ecosystem services,
- enhancing engagement of stakeholders at all levels in building climate resilience.

Ecosystem and landscape resilience are significant in order to achieve the goals of the NDC. Maintenance of forest ecosystems and important areas and biodiversity will ensure the availability of water services and other ecosystem services and are therefore a prerequisite for the achievement of food security, energy resiliency, and community life. Climate change poses a potential threat to almost to all aspects of forest-human ecosystems such as physiological responses and forms

of behavior, life cycles, competitiveness, community structures, productivity, and nutrition cycles.

The government has prepared various policies and supporting tools as modalities for mainstreaming and implementing climate-resilient development. Bappenas launched the RAN-API document (National Action Plan for Adaptation to Climate Change) in 2014.⁵¹ Regulation of the Minister of Environment and Forestry No. 33 of 2016 provides guidance in preparing climate change adaptation action plans. Ministerial Regulation No. 7 of 2018 was issued to guide the preparation of climate change vulnerability, risk and impact studies. And, as already discussed, the Ministry has developed a tool for assessing the climate vulnerability of villages, called SIDIK, which can be accessed online at <http://sidik.menlhk.go.id>. A brief explanation on Vulnerability Assessments through SIDIK is provided in Box 3.7 below.

The Ministry of Environment and Forestry encourages implementation of climate change adaptation and mitigation activities on the site level through a program called ProKlim (*Program Kampung Iklim/Climate Village Program*), which is regulated under Ministerial Regulation No. 84 of 2016. As of 2019, there were 2,146 ProKlim sites registered in the National Registry System. Four hundred and twenty seven out of these (about 20 percent) are located inside and surrounding the Forest Area. Box 3.8 below describes the winner of the ProKlim Award in 2019.

BOX 3.7

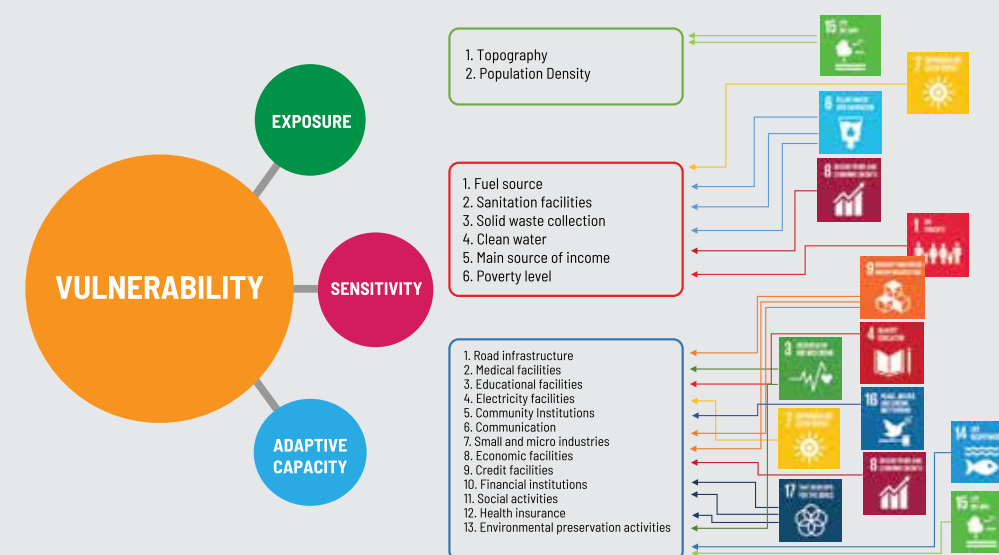
SIDIK: A National Vulnerability Index for Villages

Vulnerability assessments (VA) are needed for supporting decision making processes by specific stakeholders to adapt to the impact of climate change. The VA is the main entry point for developing a resilient adaptation strategy. As stated in Act No. 32 of 2009 on Environmental Management and Protection, the VA is a crucial part of any Strategic Environmental Assessment (KLHS). A KLHS is a series of analyses conducted systematically, comprehensively, and in a participatory manner, to ensure that sustainable development principles are integrated into the development of districts, provinces and/or policies, plans and programs.

The Ministry of Environment and Forestry has developed a tool to calculate the degree of vulnerability of each of the nation's villages to climate change, called SIDIK (*Sistem Informasi dan Data Indeks Kerentanan*). SIDIK employs nine social-economic and bio-physical indicators from Statistics Indonesia. As of 2017, SIDIK determined that there are 7,281 out of 82,190 villages (8.9 percent) that are vulnerable and highly vulnerable to climate change. Furthermore, 4,088 out of 7,281 of those vulnerable or highly vulnerable villages (56 percent) are located near or in the Forest Area (KLHK, 2017e).

Starting in 2018, SIDIK expanded to 21 indicators from Statistic Indonesia. Indicators were expanded in this way to enable SIDIK to more carefully track the Sustainable Development Goals (SDGs). SIDIK found that 7,178 out of the nation's 83,931 villages (8.5 percent) are vulnerable and highly vulnerable to climate change. Furthermore, about 4,427 out of 7,178 those vulnerable villages (61 percent) are located near or in the Forest Area.

SOURCE: [KLHK]. 2017e. Sistem Informasi dan Data Indeks Kerentanan. Jakarta: Direktorat Adaptasi Perubahan Iklim, Direktorat Jenderal Pengendalian Perubahan Iklim, Kementerian Lingkungan Hidup dan Kehutanan.



Indicators used in SIDIK to assess the Vulnerability Index and their relevance to Sustainable Development Goals

⁵⁰ MoEF, 2016b.

⁵¹ KemenPPN/Bappenas, 2014

BOX 3.8

The ProKlim Award for community-based climate action near the Forest Area

Banyuroto is a village located in Magelang Regency, Central Java Province, with a population of 2,745, of which almost 90 percent are farmers. Bordering the village on the east is Gunung Merbabu, at an altitude of 3,145 meters above sea level. The community's income is mostly from agriculture and livestock. Banyuroto has been designated as one of the Merapi-Merbabu 'agropolitan' development areas.

According to SIDIK, the vulnerability of Banyuroto in 2014 was at a moderate level (3 out of 5). Threats to the village are mainly forest fires and landslides. GHGs emissions sources come from domestic, agriculture, and livestock waste.

The village has implemented various good climate change adaptation and mitigation practices. Activities related to adaptation include: rainwater harvesting, water infiltration, spring protection, flood control infrastructure, an early warning system and evacuation routes, elevated houses, terracing of fields, rotation between crops and horticulture, irrigation, integrated farming, production of climate resilient strawberry seeds, home gardening, vector control, sanitation improvement, and adoption of healthy, clean lifestyles. Activities related to climate change mitigation include domestic waste segregation, establishment of a garbage bank, biogas development and utilization, use of organic fertilizers, planting trees to increase vegetation cover, and forest fire control.

Community groups in the village engage well and participate actively in climate change adaptation and mitigation activities, with the support of the village and local government. Because of these achievements, Banyuroto was awarded ProKlim Award in 2019 by the Ministry of Environment and Forestry.



Clean Water

Home Garden

Low Energy Stove

3.7 The Management of Peat Ecosystems

3.7.1 Policy Framework for the Management of Peat Ecosystems

The point of departure for the protection of peatlands in Indonesia was the issuance of the Presidential Decree on the Management of Protected Areas in 1990. This was the first decree to mandate the protection of peatland areas with peat soil of a "thickness of three meters or more located in upstream and swamp areas."⁵² The three meter depth was an important benchmark, and remains to this day a neutral, unambiguous, and measurable standard by which the government, in theory, is able to determine which peat areas should be protected.

While the 1990 Presidential Decree, and many of the regulations subsequent to it, have been in force for a long time, full compliance has not yet been achieved. In particular, the prohibition on planting crops on soils in excess of three meters deep has, in many instances, been observed in the breach. To this day, industrial timber and oil palm plantations are still being carried out on top of peat soils with depths of three meters or more. In addition, many agricultural and plantation activities involve the opening of canals for transportation and the manipulation of peatland water levels to drain peat soil to the extent that it can then be planted in dryland crops, despite the potential negative environmental impact of doing so. The excessive extraction of water from peatlands may cause drying, with the peat having the potential to become flammable.

To prevent the degradation of peatlands and to improve the quality of their management, the Government

passed a Regulation on the Protection and Management of the Peat Ecosystem in 2014, which was then re-issued in an even stronger form in 2016.⁵³ This pair of Government Regulations are now being further implemented through the issuance of five Ministry of Environment and Forestry regulations.⁵⁴ All of these regulations together establish a much firmer and clearer legal basis for the protection of peat ecosystems, and place this responsibility under the Ministry of Environment and Forestry. The 2016 regulation, in particular, states that the protection function of peat ecosystems is based on the fact that they preserve water balances, store carbon, and conserve biodiversity. The 2016 regulation mandates:⁵⁵

- That at least 30 percent of the total area of the nation's Peat Hydrological Unit (*Kesatuan Hidrologis Gambut*, KHG) be protected, starting from the peaks of peat domes and moving outward.
- In addition to requiring the protection of 30 percent of the KHG, the 2016 regulation also mandates the protection of peatlands with:
 - a. peat soil depths of three meters or more;

⁵³ Peraturan Pemerintah Republik Indonesia No. 71 Tahun 2014 tentang Perlindungan dan Pengelolaan Ekosistem Gambut; Peraturan Pemerintah Republik Indonesia No. 57 Tahun 2016 tentang Perubahan atas Peraturan Pemerintah Republik Indonesia Nomor 71 Tahun 2014 tentang Perlindungan dan Pengelolaan Ekosistem Gambut.

⁵⁴ Peraturan Menteri LHK No. P.14/MENLHK/SETJEN/ KUM.1/2/2017 tentang Tata Cara Inventarisasi dan Penetapan Fungsi Ekosistem Gambut; Peraturan Menteri LHK No. P.15/MENLHK/SETJEN/ KUM.1/2/2017 tentang Tata Cara Pengukuran Muka Air Tanah di Titik Penaatan Ekosistem Gambut; Peraturan Menteri LHK No. P. 16/MENLHK/SETJEN/KUM.1/2/2017 tentang Pedoman Teknis Pemulihan Fungsi Ekosistem Gambut; Peraturan Menteri LHK No. P.10/MENLHK/SETJEN/ KUM.1/3/2019 tentang Penentuan, Penetapan dan Pengelolaan Puncak Kubah Gambut Berbasis Kesatuan Hidrologis Gambut; Peraturan Menteri LHK No. P.60/MENLHK/SETJEN/ KUM.1/10/2019 tentang Tata Cara Penyusunan, Penetapan dan Perubahan Rencana Perlindungan dan Pengelolaan Ekosistem Gambut

⁵⁵ Peraturan Pemerintah No. 57/2016 tentang Perubahan atas PP No. 71/2014 tentang Perlindungan dan Pengelolaan Ekosistem Gambut, Pasal 1, angka 2, pasal 9 ayat (3), (4), dan (6).

⁵² Keputusan Presiden Republik Indonesia No. 32 Tahun 1990 tentang Pengelolaan Kawasan Lindung, pasal 10.

- b. specific and/or endemic germplasm;
- c. protected species, as defined by prevailing laws and regulations; and/or
- d. peat ecosystems located in protected areas, including Protection Forests and Conservation Forests.

Peat ecosystem areas which do not fulfill these criteria may be cultivated. In addition to strengthening peat ecosystem protection, Indonesia is working to restore over two million hectares of peatland in seven provinces - Riau, Jambi, South Sumatra, West Kalimantan, Central Kalimantan, South Kalimantan, and Papua.

In summary, the Government has adopted new policies regarding the governance and management of peatland which include: (1) conducting more comprehensive actions to prevent forest and land fire occurrence; (2) suspending the issuance of new licenses for the

utilization or protected categories of peat; (3) prohibiting further land clearing in protected peatland; (4) reviewing current forest/ plantation licenses and rearranging the concession's configurations by taking into account the existence of peatland and its hydrological function; (5) conducting a strict monitoring system in peat areas that were burnt in 2015; and (6) requesting industrial and crop plantations to restore peatland by blocking canals in order to maintain water level at minimum of 0.4 meters. The Government has also enhanced law enforcement on the ground and reinforced rehabilitation and restoration for degraded peatlands, by establishing the Peat Restoration Agency (BRG) in 2016 that now has included mangrove management and becoming Peat and Mangrove Restoration Agency (BRGM). Another regulation issued is the Minister of Environment and Forestry Decree No.246 of 2020 on the National Peat Ecosystem Protection and Management Plan (see Box 3.9).

3.7.2 Inventory of Peat Ecosystems

Indonesia has a greater extent of tropical peat than any other country in the world. These areas are found mainly in Sumatra, Kalimantan, and Papua. A small peat area also found in Sulawesi (see Appendix 4). An inventory of peat ecosystems is a necessary first step to determine the characteristics of Indonesia's peat ecosystems. The inventory of Indonesia's peat ecosystem has been completed and produced as maps for the nation's Peat Hydrological Units (*Kesatuan*

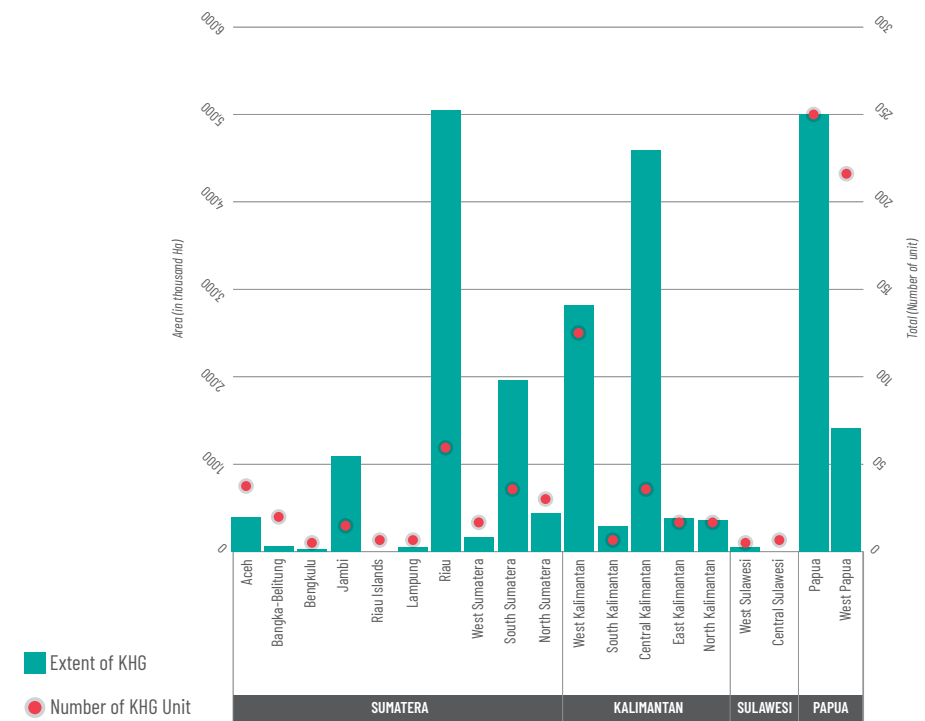
Hidrologis Gambut, KHG).⁵⁶ These maps are required to be used as references for more detailed mapping at the provincial and district/city levels (see Figure 3.21). These maps show that the total extent of Indonesia's peat ecosystem, which stands at 24.7 million hectares nationwide, with around 9.6 million hectares in Sumatra, 8.4 million hectares in Kalimantan, 6.6 million hectares in Papua, and 0.06 million hectares in Sulawesi.

In addition, a series of National Peat Ecosystem Function Maps (*Peta Fungsi*

⁵⁶ Keputusan Menteri LHK No. 129/Menlhk/Setjen/PKL.0/2/2017 tentang Penetapan Peta KHG Nasional.

BOX 3.9 Peat Ecosystem Protection and Management Plan

Peat governance in Indonesia has just passed a new milestone, with the issuance of Minister of Environment and Forestry Decree No. 246 of 2020 concerning the National Peat Ecosystem Protection and Management Plan. This Decree provides detailed strategic plans for peat ecosystem utilization, degradation control (prevention, mitigation and restoration), maintenance (reserved and conserved areas), as well as climate change mitigation and adaptation on peatland ecosystems. Each plan translates into goals, objectives, policy directions, strategies, programs and activities, and serve as a guide for stakeholders involved in peat ecosystem protection and management. The National Peat Ecosystem Protection and Management Plan (*Rencana Perlindungan dan Pengelolaan Ekosistem Gambut Nasional, RPPEG*) should be referred to and taken into consideration during establishment of development plans, such as long/medium term development plans, spatial plans, and forestry plans. RPPEG must also be referred to by other strategic and sectoral plans, including those developed by provincial and district/city governments, as well as by stakeholders. Land managers whose areas are on the peatlands are required to develop RPPEG documents for their respective management areas that are in line with this National RPPEG.



SOURCE: KLHK, 2017f

► FIGURE 3.21 Number and extent of National Peat Hydrological Unit (KHG)

Ekosistem Gambut, FEG)⁵⁷ have been prepared to serve as a guide for the establishment of a peatland ecosystem protection and management plan. In order to produce more detailed information, the Ministry of Environment and Forestry has, as of 2019, carried out an inventory of peatland ecosystem characteristics at 71 different units in the KHG, and in 21 of those units established peatland ecosystem function maps at a scale of 1: 50,000.

3.7.3 The Rehabilitation of Peat Ecosystems

With a national inventory having been conducted, the next step is to determine the extent of areas of degraded peatlands, in order to start to facilitate their rehabilitation. According to a calculation of peatland damage, there are about 23.96 million hectares (almost all) of nation's peatland ecosystems that can be classified as damaged, with the level of damage ranging from mild, to moderate, to severe, to very severe (see Table 3.6).

An area of 2,492,527 hectares of peat ecosystem have been targeted by the

government for restoration by 2020. This includes 684,638 hectares in Protected Zones (*Fungsi Lindung Ekosistem Gambut*, FLEG); 1,410,943 hectares in Licensed Cultivation Zones (*Fungsi Budidaya Ekosistem Gambut*, FBEG); and 396,943 hectares in Community Cultivation Zones (also in FBEG).

The restoration of peat ecosystems in industrial zones is conducted by drafting a Peat Ecosystem Restoration Plan. The restoration of Community Cultivation Zones is conducted through independent community programs.

3.7.3.1 Restoration of Peat Ecosystem in Concession Areas

The restoration of peat ecosystems in concession areas affects businesses operating Industrial Plantation Forests (*Hutan Tanaman Industri*, HTI) and agricultural crop (especially oil palm) plantation companies. Concession holders may be required to restore peat ecosystems in their concession areas, establish water table compliance points⁵⁸ (places where water depths are to be measured manually or automatically), building rainfall monitoring stations, blocking canals (with

or without spillways), building water gates and reservoirs, rehabilitation through replanting with endemic plant species, as well as allowing for the reintroduction of natural succession. Establishment of water table compliance points as well as rules regarding the measurement of water depth at compliance points are stipulated by the Ministry of Environment and Forestry.⁵⁹

As of December 2019, 68 HTI companies were involved in the restoration of 2,226,779.94 hectares of peat ecosystems in their concession areas, located in 87 Peat Hydrological Units, of which 1,303,133.30 hectares are areas that must be protected (*Fungsi Lindung Ekosistem Gambut*, FLEG) while in 923,646.64 hectares, cultivation may

proceed (*Fungsi Budidaya Ekosistem Gambut*, FBEG). Those 68 HTI companies will establish 5,071 Water Table Compliance Points (*Titik Penaatan Tinggi Muka Air Tanah*, TPTMAT) and equip them with 597 data logger/automatic groundwater level monitoring devices, and 265 rainfall measurement stations (Table 3.7).

With the establishment of these compliance points, companies are required to periodically make measurements and report findings to the Ministry of Environment and Forestry. In addition, companies are required to ensure that the groundwater has sunk no more than 0.4 meters below the surface. Of the 68 HTI companies, 59 have compiled Peat Ecosystem Restoration Plans (*Rencana*

⁵⁹ Peraturan Menteri LHK No. P.15/MENLHK/SETJEN/ KUM.1/2/2017 tentang Tata Cara Pengukuran Muka Air Tanah di Titik Penaatan Ekosistem Gambut. Peraturan Menteri LHK No. P.16/MENLHK/SETJEN/KUM.1/2/2017 tentang Pedoman Teknis Pemulihan Fungsi Ekosistem Gambut.

► TABLE 3.7 Restoration of peat ecosystems in industrial timber and oil palm plantations

	Industrial Plantation Forests	Oil Palm Plantations
Number of companies	68 companies	212 companies
Number of companies that have compiled RPEG	59 companies	202 companies
Peat ecosystems within the concession area	2,226,779.94 hectares	1,247,907.78 hectares
• Peat which must be protected (FLEG)	1,303,133.30 hectares	599,912.68 hectares
• Peat on which cultivation may occur (FBEG)	923,646.64 hectares	647,995.10 hectares
Number of Peat Hydrological Units (KHG) affected	87 KHG	170 KHG
Number of canals to block (2017 - 2026)	8,180 units	19,709 units
Number of Water Table Compliance Points (TPTMAT)	5,071 points	4,507 points
Number of data logger devices to be set up	597 units	515 units
Number of rainfall monitoring stations to be built	265 units	530 units
Rehabilitation areas:		
• Vegetation rehabilitation	4,438.70 hectares	-
• Enrichment planting and natural succession	306,112 hectares	-

Notes:
RPEG = *Rencana Pemulihan Ekosistem Gambut* (Peat Ecosystem Restoration Plan)
KHG = *Kesatuan Hidrologis Gambut* (Peat Hydrological Unit)
TPTMAT = *Titik Penaatan Tinggi Muka Air Tanah* (Water Table Compliance Point)

SOURCE: KLHK, Data as of December 2019.

⁵⁷ Keputusan Menteri LHK No. 130/Menlhk/Setjen/PKL.0/2/2017 tentang Penetapan Peta Fungsi Ekosistem Gambut (FEG) Nasional.

⁵⁸ The compliance point is the basis for carrying out groundwater measurements on Peat ecosystems at control points.

► TABLE 3.6 Damage of peat ecosystems by island

Island area	Degraded Peat Ecosystem (Ha)					Total extent (Ha)
	Undamaged	Mild damage	Moderate damage	Severe damage	Very severe damage	
Sumatra	34,261	6,917,767	1,617,199	574,762	16,124	9,160,114
Kalimantan	52,883	7,402,969	762,219	165,449	7,411	8,390,930
Sulawesi	268	42,411	14,908	2,573	-	60,161
Papua	93,730	6,405,442	23,274	2,939	80	6,525,465
Total peatland area	181,142	20,768,589	2,417,599	745,724	23,615	24,136,669

SOURCE: KLHK, 2018d

Pemulihan Ekosistem Gambut, RPEG), in which they have agreed to block 8,180 canals (from 2017 to 2026), rehabilitate 4,438.70 hectares of peatland vegetation, and perform enrichment planting and promote natural succession on 306,112 hectares.

In the case of the oil palm plantation sector, 212 companies have conducted TP TMAT determinations covering a total area of 1,247,907.78 hectares, located across 170 KHG, of which 559,912.68 hectares are classified as protected (FLEG) and 647,995.10 classified as for cultivation (FBEG). Across this expanse 4,507 Water Table Compliance Points have been sited, with 515 data logger/automatic groundwater level monitoring devices, and 530 rainfall monitoring stations. Of these 212 plantation companies, 202 have compiled RPEG documents.

As of 2019, the number of companies that were found to have actually improved their performance of peatland ecosystems management was 60 forest plantation (HTI) and oil palm plantations, fewer than

one quarter of those that had already submitted Peat Ecosystem Restoration Plans. The performance assessment of these companies was based on the extent to which: they had installed groundwater level compliance points (TP TMAT) and rainfall stations; the quality of their water management efforts in terms of construction of rewetting infrastructure (canal blocking, water reservoirs, and water gates); whether they had undertaken vegetation rehabilitation; their achievement of ground water level according to the current regulation. The achievement of peatland ecosystem restoration in various management units is assisted by the Peatland Water Level Information System 0.4 meters (SiMATAG-0.4m) (see Box 3.10).

Ninety nine Industrial Plantation Forests (HTI) companies hold rights to land covering an area of around 1.42 million hectares of KHG (See Table 3.8).

In addition to submitting a Peat Ecosystem Restoration Plan, HTI companies must also present revised ten-

► **TABLE 3.8** Number and extent of IUPHHK-HT concessions in hydrological peat areas

No	Province	Number of HTI	Extent of IUPHHK-HT (Ha)	Extent of FLEG (Ha)
1	North Sumatra	1	188,055	244
2	Riau	43	1,429,436	732,065
3	Jambi	3	337,626	73,257
4	South Sumatra	12	1,103,010	405,298
5	Bangka Belitung Islands	5	188,137	10,931
6	West Kalimantan	17	1,028,960	152,929
7	Central Kalimantan	8	384,815	3,604
8	East Kalimantan	3	271,870	3,436
9	North Kalimantan	3	253,871	26,731
10	Papua	3	360,645	4,327
11	West Papua	1	99,980	12,460
Total		99	5,646,405	1,425,282

Notes:

HTI: *Hutan Tanaman Industri* (Industrial Plantation Forest)

IUPHHK-HT: *Izin Usaha Pemanfaatan Hasil Hutan Kayu-Hutan Tanaman Industri* (Business License for Utilization of Timber Forest Products in Industrial Plantation Forest)

FLEG: *Fungsi Lindung Ekosistem Gambut* (Protection Function of Peat Ecosystem)

BOX 3.10

Peatland Water Level Information System (SiMATAG-0.4)

The Ministry of Environment and Forestry's Peatland Water Level Information System 0.4 meters (SiMATAG-0.4m) was launched by Minister Siti Nurbaya at the Asia-Pacific Forestry Week (APFW), Incheon South Korea on June 18, 2019. This system was built by the Ministry as an effort to monitor the implementation of peatland ecosystem function restoration in management unit areas through analysis of peatland water level monitoring data (TMAT), rewetting infrastructure and vegetation rehabilitation. To date, this system has managed to monitor data continuously and online from 10,690 manual and online peatland water level monitoring points (TMAT) as well as 792 rainfall stations scattered across areas that have been restored throughout Indonesia.

Information from the system's database can be used to evaluate the fulfillments of peatland water level compliance as regulated in the Government Regulation Number 71 Year 2014 regarding Protection and Management of Peatland Ecosystem where ground water levels (TMAT) of less than 0.4 meters must be achieved. In addition, this system can also be used to: (1) guide and improve water management in peatland ecosystem; (2) monitor the progress of peatland ecosystem restoration implementation; (3) provide data/information on peatland water levels to reduce the potential of forest and peatland fires; (4) monitor and enforce the law; (5) calculate greenhouse gas emissions reduction from peatland ecosystem restoration activities and support the resilience of ecosystems to climate change. SiMATAG-0.4m has also been equipped with satellite imagery data for soil moisture to detect the success of water management interventions on peatlands, and help calculate greenhouse gas emissions. Furthermore, SiMATAG-0.4m was internationally recognized as the most massive of ground water peatland monitoring system in the world, when it was presented in the Experts Workshop on Peatland Monitoring at FAO Headquarter, Rome-Italy, 22nd-23rd May 2019, as well as at ASEAN Task Force on Peatlands (ATFP) meetings. In the future, SiMATAG-0.4m will be used to support policy making decision support systems on peatland ecosystems protection and management, through the development of the Peatland Ecosystem Protection and Management Information System (SiPPEG). SiPPEG will integrate various data and information on peatland water levels (TMAT), water balance or water availability in KHG, potential drought and fire vulnerability, risk and impacts, as well as calculations of greenhouse gases reduction from increased peatland moisture.

year Business Work Plans (*Rencana Kerja Usaha*, RKU). In revised RKU documents, a peat ecosystem restoration plan, a peat hydrological function protection plan, and a description of forest and land fire prevention and control facilities are described.

Besides industrial plantation forest concessions located in peat ecosystems, there is also one concession for the selective felling of natural forest timber (IUPHHK-HA) that is located inside a peat ecosystem. The area of this one concession

is 44,595 hectares, of which 1,400 hectares qualify for protection (FLEG) while on the remaining 43,195 hectares, selective felling of natural forests may take place (FBEG).

Meanwhile, there are nine ecosystem restoration concessions (IUPHHK-RE) which are located on 332,491 hectares of peat ecosystem. In these concessions, areas with good tree stands will be maintained, and areas with no tree stands must be restored by planting endemic species.

3.7.3.2 Restoration of Peat Ecosystem on Community Land

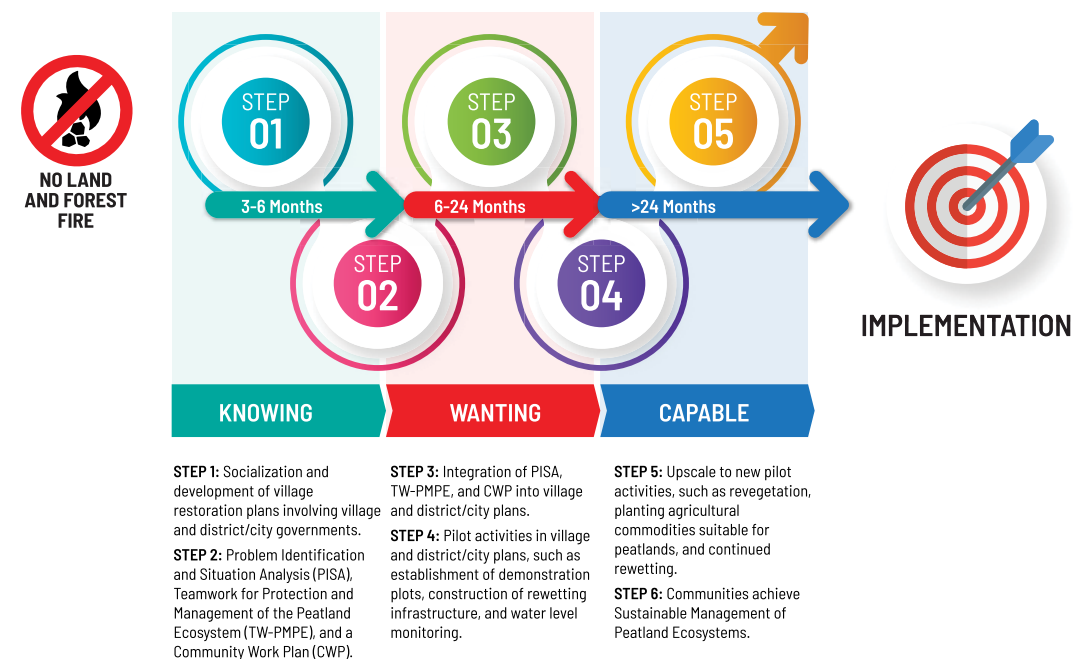
As described in Section 3.7.2, the inventory of Indonesia's peat ecosystem and functions have been mostly completed (see Footnote 56 and 57). Based on that inventory and mapping, it was found that approximately 79 percent of the peatland ecosystem is utilized by community and informal users. Therefore, the involvement of communities is essential for peatland conservation and restoration at the site level.

In 2016, the Ministry of Environment and Forestry developed a community-based peatland conservation and restoration program to encourage community involvement. This program was established in collaboration with local governments, universities, and the private sector. The principle concepts of this program are *Bring Back the Water, Bring Back the Vegetation, and Improve Community Livelihoods*. The program consists of six steps, starting from socialization and development of village restoration plans involving village and district/city governments (Step 1). Step 2 consists of several activities in the village, notably: Problem Identification and Situation Analysis (PISA); Teamwork for Protection and Management of the Peatland Ecosystem (TW-PMPE); Community Work Plan (CWP). Step 3 is integration of PISA, TW-PMPE, and CWP into village and district/city plans. Once Step 3 is approved by the respective village and district/city governments, Step 4 pilots the activities in village and district/city plans. Activities could include establishment of demonstration plots, construction of rewetting infrastructure, and water level monitoring. Step 5 is upscaling to new pilot activities, such as revegetation, planting agricultural commodities suitable for peatlands, and continued rewetting.

The final step of the program (Step 6) is the actual achievement of the goal of the program - Sustainable Management of Peatland Ecosystems by Communities. In this last step, it is expected that village communities will have developed self-awareness of the importance of sustainable peatland management through the benefits obtained during piloting and upscaling activities (Step 4 and 5), and then will then continue integrating new activities into their village development plans. Steps 1 to 5 are expected to be completed within 2 years. Step 6, it is hoped, will continue indefinitely. Figure 3.22 below re-presents these steps.

From 2015 to 2019, 9,950 hectares of community peatland, in 54 villages, 24 districts and 7 provinces were restored under this program. This program involved seven universities and 121 local facilitators. This Ministry of Environment and Forestry program also has an important livelihoods dimension, integrating silviculture, silvofisheries, paludiculture, and agroforestry methods. The success stories record that communities obtain multiple benefits from these programs, not because they are safe from peatland fires, but also because they obtain improvements in their livelihoods and greater food security. For instance, a sago plantation was established on a 3-hectare area of peatland area in Mak Teduh village, Pelalawan District. Elsewhere in Pelalawan, fish farming has been established on a different 3-hectare area of peat. Agroforestry plots combining agricultural crops such as corn and pineapple, with forest palm and trees such as areca nut (pinang) and rambutan, have been established on 8 hectares of peatland in Indragiri Hilir District. In the 54 villages reached, no fires have occurred in areas with rewetting and canal blocking.

Alongside the activities implemented by the Ministry of Environment and Forestry, the Peatland Restoration Agency



► **FIGURE 3.22** Self-supporting peat villages: Multi-stakeholder conservation and sustainable peatland management in Indonesia

(BRG) and the private sector have also established some peat activities with community involvement. BRG developed the “Village Peatland Awareness Program.” The program, also known as *Desa Peduli Gambut*, or “Villages that Care for Peat,” is active in 394 villages in seven provinces: Riau, South Sumatera, Jambi, West Kalimantan, Central Kalimantan, South Kalimantan, and Papua. According to BRG (2020), between 2016 and 2019, community peat rewetting activities were conducted across 782,301 hectares.

PT. Pertamina Refinery Unit II Production Sungai Pakning, a refinery of the Indonesian state oil company in Bengkalis District, Riau Province, is also involved in community-based peatland conservation and restoration. Pertamina Sungai Pakning established a community sustainable peat program that aims especially to prevent peatland fires. This corporate social responsibility (CSR) program is known as the *Berdikari Peat Village Program*. Among the benefits are: 14.5 hectares of burned peatland

has been restored and is being used to grow pineapples. This activity generates about USD 1,700 per hectare in income for community groups. *Berdikari* has also formed a 49-member Community Fire Awareness Group, known as *Masyarakat Peduli Api* (MPA), literally, “People Who Care About Fires.” MPA entrepreneurship activities now generate income of about USD 84,000 per year. MPA has established a Peatland Arboretum which attracts 1,500 visitors per month, generates about USD 2,500 per month in revenue, and works in collaboration with 36 institutions/schools.

Also in Pertamina Sungai Pakning CSR, the Golden Generation Program increases the awareness of the younger generation in the peatland ecosystem, through a school curriculum aimed at loving peat. This curriculum has been introduced to 25 primary schools in Bengkalis District, and reached more than 3,285 students. In this curriculum, the students have been taught about the benefits of peatlands, efforts to conserve peatlands, and the various uses of peatlands.



Children happiness when playing in the peat canal.

LOCATION
Sei Tarolet Village, Labuhan batu,
North Sumatra

PHOTO BY
Biro Perencanaan, KLHK (2019)

3.7.4 Peatland Conservation and Sustainable Management to Support Food Security

Tropical peatlands in Indonesia have enormous benefits, such as forestry, flood control, fire control, eco-tourism, climate stability, biodiversity, improved livelihoods for local communities, and education and research. With an area of 24.7 million hectares, Indonesia's tropical peatland ecosystem supports biodiversity conservation, industrial timber and crop plantation concessions, community-used areas (both within the Forest Areas and Lands for Other Uses/APL), and open space. Peatlands are utilized to support the social, cultural, and economic needs of communities, including indigenous communities. Although the soils in peatlands are weak in nutrients, in several parts of Indonesia, peatland ecosystems

produce food for largely subsistence-based community economies. Sabiham (2008) writes that shallow peat soils (< 100 cm) can be utilized for vegetable and perennial crop cultivation.

As described in Section 3.2, a Food Estate SEA was started in early 2020. The Ministry of Environment and Forestry has established a plan to restore and rehabilitate several peatland areas in some provinces, among others Central Kalimantan, Jambi, South Sumatera, and Papua. In Central Kalimantan, 36,936 hectares of severely and very severe damaged peatland in the ex-Mega Rice Project will be restored and rehabilitated between 2020 to 2022. This activity will involve collaborating with multiple stakeholders, such as local governments, universities, experts, local leaders, communities, and the private sector.

3.7.5 Maintaining Commitments and Strengthening Global Collaboration on Conservation and Sustainable Management of Tropical Peatlands

Indonesia is one of the leading countries in tropical peatlands management and research, and the founding country of the International Tropical Peatlands Center (ITPC), which includes the Democratic Republic of Congo, the Republic of Congo and Peru. Other parties supporting the work of ITPC include the Center for International Forestry Research (CIFOR), the U.N. Environment Programme (UNEP) and the U.N. Food and Agriculture Organization (FAO). Indonesia is committed to conserving tropical peatlands and is taking a pro-active approach to restoring and protecting peatlands, as well as improving capacity of itself and other countries in tropical peatland management.

The ITPC was launched in Jakarta on 30 October 2018. The four participating governments signed a joint declaration:

- acknowledging the important role of peatlands at global, regional and national levels in addressing climate change, protecting biodiversity and the environment, and contributing to the social economic welfare of people;
- recognizing the need to increase capacity through collaboration to promote best practices for conservation and sustainable management of peatlands;
- committing to common interests in tropical peatlands and ongoing efforts by governments and partners to conserve and manage them in a sustainable manner;
- committing to strengthening networking and collaboration.

In the spirit of international, multi-stakeholder and South-South cooperation, the ITPC was built on the principle of true cross-sector collaboration and integration. Recognizing this important

cooperation, the roles of the ITPC are: (i) serving as a go-to space for South-South cooperation, which will support the dissemination of strategies and practices for tropical peatland management through coordinating and supporting collaborative international relationships and connecting different stakeholders; (ii) conducting and disseminating scientific research on tropical peatland management for sustainable development; (iii) aiming to become a center of excellence for tropical peatland research to support policy development; and (iv) providing capacity building and technical services.

Since its inception in 2018, the ITPC has organized and participated in many international events (e.g. Global Landscapes Forum, UN Forum on Forests, Asia-Pacific Forestry Week, UN Climate Week, IUFRO World Congress, UNFCCC COP 25) to promote sustainable management of tropical peatlands. During the historic Fourth United Nations Environment Assembly (UNEA-4) in March 2019, Indonesia initiated the first-ever global resolution for the 'Conservation and Sustainable Management of Peatlands', which was adopted by all countries. The resolution calls for the recognition of peatlands and their important role in the global ecosystem. The resolution encourages Member States and international organizations, including the ITPC, to cooperate with national, regional, and international peatland management organizations and all actors to foster the conservation and sustainable management of peatlands.

Highlighting the fact that peatland management is not only the concern of developing tropical nations, but also developed countries that are facing the same problem of peatland degradation, Indonesia hopes to forge 'synergies for peatlands' through the ITPC and other international initiatives.

3.8 Restoration of Forest Landscapes

The Indonesian Government ratified the United Nations Convention to Combat Desertification (UNCCD) in 1998 by issuing Presidential Decree No. 135 of 1998. UNCCD missions offer new approaches and coordination techniques to combat land degradation and drought through action programs, research and international support. One of mandates from UNCCD is to improve sustainable land use in the field by using a Land Degradation Neutrality (LDN) indicator. LDN represents a stable or improved condition of land resources needed for supporting ecosystem functions and services, as well as improvement of food security. As of 2018, Indonesia had 14.06 million hectares of severely degraded land (*lahan kritis*), with high erosion rates and poor soil fertility.

During the period of 2015 to 2019, the Government set a target to reduce the extent of severely degraded land by 5.5 million hectares. This was spread across 34 provinces, which are managed through 34 Watershed and Protection Forest Area Management Offices (*Balai Pengelolaan Daerah Aliran Sungai dan Hutan Lindung*, BPDASHL). However, severely degraded lands are not always located in watershed or protection forest areas. They are also located in production forest areas, which are under the management of timber concessions, government Production Forest Management Units (*Kesatuan Pengelolaan Hutan Produksi*, KPHP), or under lease for non-forestry purposes, such as mining, through lease use licenses (*Izin Pinjam Pakai Kawasan Hutan*, IPPKH). Severely degraded lands are also found in conservation forest areas which are managed by KSA/KPA offices, or in areas where Social Forestry schemes are implemented. In non-Forest Areas (Other Use Areas, APL), severely degraded lands

can be found anywhere, and the managers of such areas can be a local community, a local government, a non-forestry company, etc. Forest rehabilitation or restoration both within or outside the Forest Area is best implemented by the managers of these areas, and embedded into their duties as area managers, and not necessarily monitored by or reported to the BPDASHL in all cases.

The government target for rehabilitating 5.5 million hectares in severely degraded lands was set at 1.25 million hectares per year from 2015 to 2018 and 500 thousand hectares for 2019. The total budget allocated for rehabilitating 5.5 million hectares of severely degraded lands was USD 354 million for five years. This level of funds is insufficient, however, and can only cover the rehabilitation of about 200,000 hectares per year by Ministry of Environment and Forestry's Directorate General of Watershed and Protection Forest Management (*Direktorat Jenderal Pengendalian Daerah Aliran Sungai dan Hutan Lindung*, DJPDASHL). This leaves no obvious way forward for the annual rehabilitation of more than one million hectares of remaining severely degraded lands, suggesting that this will have to be financed out-of-pocket by concessionaires through Public Private Partnership, lease use license holders, KPHP, KSA/KPA, social forestry license holders, local governments and land managers throughout Indonesia. In fact, resources turned out to be inadequate for the undertaking and, in the end, only 1,183,581 hectares were rehabilitated (See Section 3.8.1 and Table 3.9 for details).

The Ministry of Environment and Forestry remains committed to restoring degraded lands, and has a National Action Programme of Land Degradation Mitigation (NAP-LDM). From 2020 to 2024, NAP-LDM will undertake Forest and Land Rehabilitation (FLR) activities, focusing

on construction of 65 dams, rehabilitation of 3,000 watersheds, 15 prioritized lakes, and 1.5 million hectares of disaster-prone watersheds. Based on current financing capacity, land rehabilitation targets for 2020 are 56,000 hectares, 220,000 hectares for 2021, and 230,000 hectares per year from 2022 to 2024. This includes, mangrove rehabilitation of 1,000 hectares for 2020, and 1,250 hectares per year from 2021 to 2024. As things stand now, 637,000 hectares out of 3.3 million hectares of mangrove throughout Indonesia are degraded.

The work of NAP-LDM through 2030 will focus on:

(1) Improvement of awareness and education on the importance of tree planting for disaster mitigation, climate change mitigation, and environmental improvement

(2) Issuance of regulations to support mitigation actions in relation to each sector of the economy that contributes in major ways to land degradation

(3) Improvement of aspects of Science and Technology pertaining to land recovery

(4) More tree planting, to be financed through increased funding from Corporate Social Responsibility (CSR) and District Budget Allocations (APBD)

(5) Increased mobilization of public funding, including through fiscal transfers

(6) Implementation of mitigation measures for deforestation, land degradation and drought, through free distribution of seedlings, nursery certification, community nursery establishment, agroforestry, water and land conservation, CSR, MoUs



► FIGURE 3.23 Launching event of the Interim Secretariat of the International Tropical Peatlands Center (ITPC), Jakarta. PHOTO BY: Ricky Martin/CIFOR (2018).

with 179 universities and the Ministry of Religious Affairs, reclamation and rehabilitation of post-mining areas, and a tree planting movement that calls for “planting 25 trees for a lifetime”.

Revenue Sharing from the Reforestation Fund (*Dana Bagi Hasil - Dana Reboisasi*, DBH-DR)⁶⁰ has, for most of the current century, been distributed to provincial and district/city governments to be used for reforestation and land rehabilitation. However, based on Act No. 10 of 2019 on National Revenue and Expenditure in the Year 2020, these funds will, retroactive to 2017, only be distributed to provincial governments that contributed to the revenue forming the Reforestation Fund, and will no longer be distributed to province/district/city governments that is not contributing to the Reforestation Fund. These funds can be used by provincial governments for planning, implementation, monitoring, and evaluation of forest and land rehabilitation activities, and for other supporting activities.⁶¹ Supporting activities is defined in Act No. 10 of 2019 as: forest protection and patrols; development of technologies for forest and land rehabilitation; forest and land fire prevention and control; seed improvement; research and development; education and training; extension; social forestry to support forest and land rehabilitation; improvement of local communities livelihoods; Forest Management Unit (FMU) operational activities; technical guidance; supervision and control.

This Act also mentions that the remaining balance of DBH-DR from the earlier years (before 2017) that is still kept in district/city treasuries is allowed to be reallocated for activities within the district/city for: management of Grand Forest Parks; prevention and control of forest and land fires; supporting forest and land rehabilitation; tree planting in critical watershed areas and local protection areas; construction of soil and water conservation facilities.

An earlier regulation issued by the Ministry of Finance Affairs also states DBH-DR can be used for supporting social forestry programs and programs to combat climate change⁶². The total DBH-DR that was distributed to provincial governments in 2020 was USD 43,260,160.⁶³

3.8.1 Forest and Land Rehabilitation in Watershed Areas

Rehabilitation efforts involve the rehabilitation of reservoirs, priority lake areas, and river basins, the development of mangrove forests and urban forests, and the establishment of community nurseries. Efforts may also involve the construction of dams and retaining bars, gully plugs and absorption wells. In 2019, a total area of 395,168 hectares was rehabilitated. This included about 206,000 hectares of conservation and protection forests, one thousand hectares of mangrove forests, beaches, swamps, and peat, and 188,168 hectares of community lands benefitted from

community nurseries. Table 3.9 shows the progress of forest and land rehabilitation from January 2015 up to December 2019. During this year, 944 check dams and 2,330 gully plugs were also constructed. Figure 3.24 shows planting activities in a mangrove area in Langsa (Aceh Province) involving students and communities as a means of mainstreaming environmental awareness to young generations.

Communities are expected to contribute to the disaster mitigation and

climate change adaptation, including in relation to floods, landslides, and droughts. Success of land rehabilitation, however, depends on the quality of seedlings. To prepare productive seedlings for planting, the Government established Permanent Nurseries throughout Indonesia (see Figure 3.25). As of 2019, there were 57 units of Permanent Nurseries all over the country, with 7 of them using tissue culture technologies. Table 3.10 shows seedlings production from Permanent Nurseries.

► **TABLE 3.9** Area planted for rehabilitation of forest and land in 34 watersheds in 2015 - 2019

Year	2015	2016	2017	2018	2019
Type of Area (in hectare)					
Conservation/Protection Forests	10,508	7,067	19,482	25,170	206,000
Mangrove Forests/Beaches/Swamps/Peat	481	497	1,175.40	960	1000
Urban forest	240	215	452	-	-
Agroforestry	7,624	13,416	15,875	-	-
Land rehabilitation with seedlings from community nurseries	181,594	177,151	164,006	162,500	188,168
Total	200,447	198,346	200,990	188,630	395,168

SOURCE: KLHK, Data as of December 2019

► **TABLE 3.10** Number of seedlings produced for rehabilitation of forest and land in 2015 - 2019

Year	2015	2016	2017	2018	2019
Type and Number of Seedlings					
Seedlings produced by Permanent Nursery (# seedlings)	37,378,014	48,718,521	52,069,475	49,549,368	50,231,461
Productive seedlings produce by Permanent Nursery (# seedlings)	-	664,130	3,210,211	2,623,573	4,653,082

SOURCE: KLHK, Data as of December 2019

⁶⁰ Reforestation Fund is fund collected from license holders of forest product utilization from natural forest in the form of timber for reforestation and forest rehabilitation. The fund is used only to finance reforestation and rehabilitation activities and supporting activities (Elucidation of Act No. 41/1999)

⁶² Peraturan Menteri Keuangan No. 131/PMK.07/2019 tentang Penggunaan, Pemantauan, dan Evaluasi Dana Bagi Hasil Sumber Daya Alam Kehutanan Dana Reboisasi. Accessible at: <http://www.djpk.kemenkeu.go.id/?p=13740>

⁶³ Peraturan Presiden Republik Indonesia No. 72 Tahun 2020 tentang Perubahan atas Peraturan Presiden No. 54 Tahun 2020 tentang Perubahan Poststr dan Rincian Anggaran Pendapatan dan Belanja Negara Tahun 2020, Lampiran VI-7. Accessible at: <http://www.djpk.kemenkeu.go.id/wp-content/uploads/2020/06/7a.-Perpres-Nomor-72-Tahun-2020-Lampiran-VI.1-10.pdf>

⁶¹ Undang-undang No. 20 Tahun 2019 tentang Anggaran Pendapatan dan Belanja Negara Tahun 2020. Accessible from: <https://www.kemenkeu.go.id/media/13535/uu-apbn-2020.pdf>

Meanwhile, in the spirit of community empowerment, and to provide incentives to communities, as well as economic benefit for communities, and to prepare productive seedlings for planting outside Forest Areas, the Government established Community Nurseries throughout Indonesia. Community Nurseries consist of two types: Village Nurseries (*Kebun Bibit Desa*, KBD) and People's Nurseries (*Kebun Bibit Rakyat*, KBR). As of 2019, 561 KBD units produced about 23.5 million seedlings and 2,033 KBR units produced about 50.7 million seedlings.

Forest and land rehabilitation improve community welfare. Participating in government rehabilitation of forests and land is a source of paid work for many forest communities. Meanwhile, in the long-term, communities will be able to harvest fruits and non-timber forest products (NTFP) such as gums and resins, from rehabilitated forests. In the next five years, rehabilitated lands and

forests are expected to become fruit, nut and NTFP production centers. Almost 80 percent of the seedlings planted for rehabilitation purposes are fruits and nuts, such as macadamia, candlenut (*kemiri*), durian, avocado, guava, soursop, and pungent beans (*jengkol*); and gum and resin producing species, notably pine and rubber. Figure 3.26 shows the process of taking what will eventually be macadamia nut trees from seeds until seedlings ready for planting, by a community in Banjarnegara (Central Java).

Forest and land rehabilitation programs have also been conducted in areas affected by natural disasters. Rehabilitation activities are conducted to prevent and mitigate the impacts of floods and landslides in the wet season as well as droughts in the dry season, to support the achievement of food security, to increase resilience in disaster prone areas, to increase community incomes, and to raise awareness of the importance

of planting trees to improve the quality of the environment. Starting in January, 2020 in Bogor and Lebak districts, post-disaster agroforestry-type landslide rehabilitation will be undertaken by planting 'vetiver' (*Chrysopogon zizanioides*) as a cover crop for cliffs. This species is a perennial bunchgrass of the family Poaceae with rough leaves, and has strong and deep roots. It is said to be highly suitable for landslide mitigation in areas with extremely steep slopes. It also has an economic benefit, as essential oils can be extracted from its roots.

Mining and non-mining concessionaires who operated under lease use licenses (IPPKH) are obliged to

rehabilitate watershed areas surrounding their concessions. From January 2013 until September 2020, IPPKH holders have re-planted 108,920 hectares of watersheds in Indonesia. Of this, 16,155 hectares have already been returned to the Ministry of Environment and Forestry.

3.8.2 Forest Restoration in Forest Concession Areas

Forest restoration activities are also conducted on logged-over areas of natural forests, both under natural forest timber concessions (IUPHHK-HA) and ecosystem



PHOTO BY: Piko Shorea (2019)

► FIGURE 3.24 Mangrove planting involving students and communities in Langsa, Aceh Province



PHOTO BY: Piko Shorea (2019)

► FIGURE 3.25 Permanent nursery in Jomin Timur, Purwakarta

restoration concessions (IUPHHK-RE), as well as in Industrial Plantation Forests (IUPHHK-HT). However, in all these concession areas, the activity is not commonly referred to as 'rehabilitation' or 'restoration', but merely called 'planting' as it is one of the obligations that must be fulfilled after the extraction of timber. Especially for ecosystem restoration concession areas (IUPHHK-RE), the focus is on efforts to restore the ecosystem to the maximum extent possible to its original state in terms of the structure and composition of the forest, and biodiversity conditions. Therefore, this type of concession area is sometimes given out in degraded forest areas.

The basic principles of ecosystem restoration development are: to maintain forest functions (the status of the forest area); to ensure forest protection and maintenance (conservation); to restore levels of biodiversity and non-biological diversity; to optimize the utilization of non-timber forest products and environmental services; to achieve sustainability; and to facilitate rehabilitation. Ecosystem restoration also plays an important role in climate resilience, in carbon emission reduction as well as increasing carbon stocks. Ecosystem restoration activities also increase biomass, and provide protection from forest fires.



PHOTO BY: BPDASHL SOP (2019)

► **FIGURE 3.26** Macadamia nursery by a community in Banjarnegara, Central Java: a process from seeds preparation until seedlings ready for planting

► **TABLE 3.11** Size of area planted with trees in production forest areas from 2015 to 2020

	Type of management of Production Forest area (in hectares)			
	IUPHHK-HA	IUPHHK-HT	IUPHHK-RE	KPHP
2015	181,052	333,298	974	940
2016	21,339	300,075	2,657	2,344
2017	15,942	206,757	3,477	233
2018	20,865	240,743	24,865	2,424
2019	20,594	330,073	10,378	5,138
2020	3,117	93,149	41,178	0
TOTAL	262, 909	1,504, 095	83,530	11,079

Notes:

IUPHHK-HA = Business License for the Utilization of Timber Forest Products in Natural Forests
 IUPHHK-HT = Business License for Utilization of Timber Forest Products in Industrial Plantation Forests
 IUPHHK-RE = Business License of the Utilization of Timber Forest Products for Ecosystem Restoration
 KPHP = Production Forest Management Unit

SOURCE: KLHK, as of May 2020

In contrast to IUPHHK-HA/HT permits, which are issued to facilitate the harvesting of natural forests and planted timber, IUPHHK-RE permits do not allow logging prior to the achievement of biological and ecosystem balance. Ecosystem restoration permits still allow a range of business activities, such as area utilization (for example, ecotourism), non-timber forest products and environmental services, all of which can be implemented prior to the reaching of full ecosystem balance.

The achievement of planting activities in natural forest, timber plantation, and ecosystem restoration concession areas, as well as areas managed by KPHPs, are presented in Table 3.11.

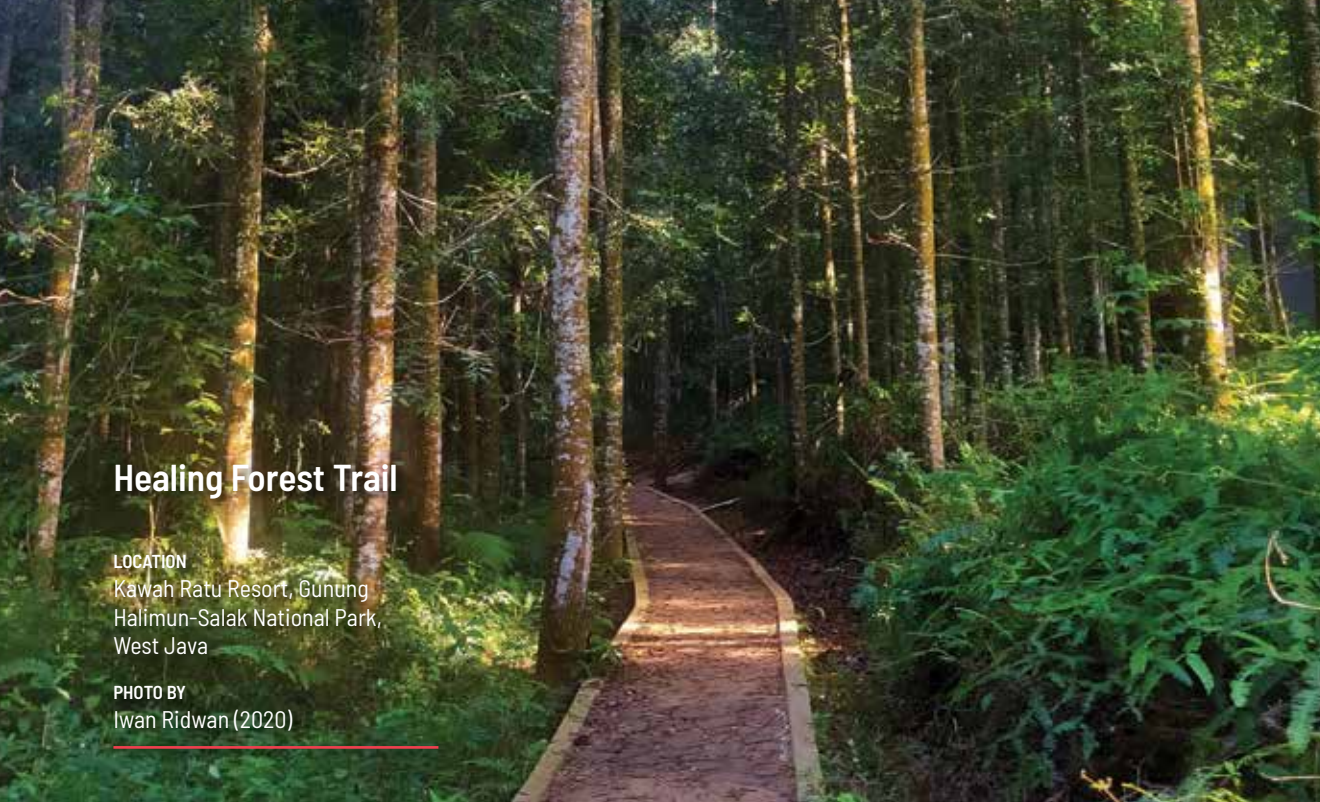
In addition to rehabilitation by timber concessionaires mentioned above, reclamation of forest areas has been conducted by mining and non-mining concessionaires which holds lease use licenses. As shown in Fig. 3.7 (See Section 3.4.2), the total forest area occupied under this scheme is 631,200 hectares, including 556,200 hectares for coal, geothermal, oil and gas and 75,000 hectares for infrastructure such as, roads, railways,

telecommunication tower, electricity facilities, dams, disaster evacuation areas, weather and meteorological facilities. Many parts of the mining sites and areas surrounding the infrastructures have been replanted for reforestation by the concessionaires. As of September 2020, 36,123.3 hectares have been reclaimed. Of this reclaimed area, 2,765 hectares has been handed back to the Ministry of Environment and Forestry so far.

3.8.3 Ecosystem Restoration in Conservation Areas

Approximately 2 million hectares of lands in conservation areas has been identified as severely degraded.⁶⁴ Conservation Area is intended to protect life support systems, and preserve plant and wildlife species diversity and their ecosystems. Conservation Forest restoration is not merely about restoring

⁶⁴ KLHK, 2017g.



Healing Forest Trail

LOCATION
Kawah Ratu Resort, Gunung Halimun-Salak National Park, West Java

PHOTO BY
Iwan Ridwan (2020)

trees, but is aimed at restoring all ecosystems and all functions, including plant and animal populations and biodiversity, both in terrestrial and in marine conservation areas. Therefore, ecosystem restoration in Conservation Area is implemented through three main approaches: natural mechanisms⁶⁵, ecosystem rehabilitation⁶⁶, and ecosystem restoration⁶⁷, as guided in the Regulation on the Procedures of Implementing Ecosystem Restoration in Sanctuary Reserve Areas and Nature Conservation Areas⁶⁸.

⁶⁵ Natural mechanism is a remedy toward ecosystem that indicated to be declining in its function, through the protection of natural process continuity, for achieving the balance of biological natural resources and their ecosystems balance toward their original condition.

⁶⁶ Ecosystem rehabilitation in a Conservation Area is a remedy to ecosystems that have been damaged in the form of reduced land cover, damage to water bodies or seascapes through the action of planting, rehabilitation of water bodies or rehabilitation of seascapes for achieving the balance of biological natural resources and their ecosystems toward their original condition.

⁶⁷ Ecosystem restoration in Conservation Area is an act of restoring the ecosystems that have been damaged in the form of reduced land cover, damaged water bodies or seascapes and disrupted wildlife status, aquatic biota, or marine biota, through the action of planting, rehabilitation of water bodies or rehabilitation of seascapes, habitats and populations for achieving the balance of biological natural resources and their ecosystems toward their original condition.

⁶⁸ Peraturan Menteri Kehutanan No. P.48/Menhut-II/2014 tentang Tata Cara Pelaksanaan Pemulihan Ekosistem pada Kawasan Suaka Alam dan Kawasan Pelestarian Alam

Ecosystem restoration in Conservation Area has been encountered various obstacles, including lack of funding, lack of tools and facilities, lack of technical skills, lack of partners, etc. Therefore, ecosystem restoration in Conservation Areas takes a different approaches than the one used in Protection and Production Forests, as well as in other ecosystem restoration programs outside the Forest Area. The approach in Conservation Area is through partnerships with stakeholders, especially local communities dwelling in or at the fringe of Conservation Areas. Local communities who at one time were considered as “encroachers” are now seen as partners in ecosystem restoration in Conservation Areas. Although still small in number, out of 554 terrestrial and marine Conservation Areas in Indonesia, there are 13 which have shown success in ecosystem restoration using this new approach. Table 3.12 lists the 13 conservation areas, the types of habitat restored, and the partners who have facilitated the work of Conservation Area managers and local communities.

3.8.4 World Mangrove Center Initiative to Expedite Mangrove Rehabilitation and Conservation

Indonesia is aiming to establish a World Mangroves Center (WMC) to serve and share Indonesia’s experiences in mangrove rehabilitation and conservation actions and collaborate with global stakeholders to save the world’s mangroves. The Indonesian Government considers mangroves to have high blue carbon potentials, as a part of the National Low Carbon Development Strategy. The WMC initiative arose because of the need to integrating the many efforts to sustainably rehabilitate and manage mangrove forests, which heretofore have been done in separate and scattered ways, with many stakeholders. While progress has been made in saving certain mangrove areas, many others remain unassisted. The good news is that research and development on technologies for

mangrove cultivation have improved. For this reason, there needs to be a sharing and learning platform so stakeholders can exchange this information, and learn from each other.

The WMC is being designed as a reliable, science-based, mitigation- and adaptation-oriented Center of Excellence. It will support the implementation of Indonesia’s NDC as well as the SDGs. It will serve as a Clearing House, and provider of reliable data and information on mangroves, and will be acknowledged by all parties. The WMC will also serve as an International Hub to provide access to mangrove ecosystem research. The WMC will connect, coordinate, and foster collaboration between different stakeholders at all levels and in many sectors across many nations. The WMC will be supported by the German Government through the BMZ’s Forest Program VI for Protection of Mangrove Forests.

► **TABLE 3.12 Partnerships in ecosystem restoration in conservation areas**

No	Conservation Area	Type of habitat restored	Partner	Extent of ecosystem restored (in ha)
1	TN Gunung Leuser	Tropical Rainforest	UNESCO, OIC	870
2	TN Bukit Barisan Selatan	Tropical Rainforest	UNILA-PILI-OWT	200
3	TN Way Kambas	Tropical Rainforest	Tropis Alert	1,715
4	CA Pulau Dua (Serang)	Mangrove	Wetlands International	715
5	TN Gunung Gede Pangrango	Tropical Rainforest	Mitsubishi Corporation, OISCA Sukabumi TC	18
6	TN Gunung Ciremai	Tropical Rainforest	JICA-JICS	7,728
7	SM Paliyan	Karst	Mitsui Sumitomo Insurance Ltd	350
8	Tahura Ngurah Rai	Mangrove	JICA	250
9	TN Gunung Palung	Tropical Rainforest	Yayasan Asri	37
10	TN Betung Kerihun Danau Sentarum	Tropical Rainforest		36,579
11	TN Sebangau	Tropical Rainforest (peatlands)	WWF	688 (and the blocking of 24 km of canals)
12	TN Manupeu Tanadaru Laiwangi Wanggameti (TN Matalawa)	Tropical Rainforest	JICA-JICS	4,868
13	TN Taka Bonarate	Coral reef		870

Notes:
TN = Taman Nasional (national park)
CA = Cagar Alam (strict nature reserve)

SM = Suaka Margasatwa (wildlife sanctuary)
Tahura = Taman Hutan Raya (grand forest park)

SOURCE: KLHK, 2017g.

A wide-angle photograph of a dense tropical forest. In the foreground, a river with clear, greenish water flows from the right towards the center. The banks are covered in thick, vibrant green vegetation, including tall trees and various shrubs. The background shows a steep, forested hillside with a mix of tree heights and colors, ranging from deep green to bright yellow-green. The overall scene is a beautiful representation of a healthy tropical ecosystem.

The Beauty of Tangkahan Forest

LOCATION
Gunung Leuser National Park,
North Sumatra

PHOTO BY
Iskandar Kamaruddin (2018)

CHAPTER 4

Roles of Communities
in Sustainable Forest
Management4.1 Provision of Access to Communities
through Social Forestry

There are 25,863 villages that closely interact with Indonesia's Forest Area. These villages are located either within or at the fringe of the Forest Area. The total population of these villages is 37.2 million individuals, consisting of about 9.2 million households, of which around 1.7 million are classified as poor.⁶⁹ In addition to members of local communities and *Adat* communities, many of these villages are also inhabited by migrant and transmigrant populations. Since the 1970s, problems related to poverty, land conflict and forest degradation have affected forestry management. As of 2018, the Indonesian Human Development Index stood at 0.707, placing Indonesia below the mid-point, at 111 out of 189 countries and territories. As of September 2019, the Gini coefficient stood at 0.38, a reduction of 0.06 from March 2017 as reported in the State of Indonesia Forests 2020 publication.⁷⁰ These figures show that Indonesia faces challenges in addressing poverty, and that inequality is increasing.

Social Forestry is intended to provide communities with legal access to utilize forest resources. Prior to the 1990s, communities living in and around the Forest Area were not regarded as having the potential and capacity to play a significant role in the management



The *adat* community of Tenganan Pegringsingan holds festivals for its *adat* forest

LOCATION
Tenganan Pegringsingan *adat* forest,
Karangasem District, Bali

PHOTO BY
DJPSKL (2019)

of forests, and were instead seen as sources of cheap labor for plantation and forestry activities. In the period from 1990 to 1998, there was a growing acceptance and awareness of the concept that communities living in and around forests could play an active role in forest management. To achieve this, they needed to be given rights and access to forest resources in a way that is empowering.

There are at least two knowledge constructs in relation to forest development and management - conventional forestry and social forestry. Conventional forestry sees forests from extreme points of view: timber and/or nature conservation. Social forestry tries to balance the protection, conservation, social, and economic benefits and functions of forests. These two knowledge constructs differ in terms of ontology. The ontology of conventional forestry is based on flora,

fauna, and ecosystems. The ontology of social forestry is based not only on flora, fauna, and ecology, but also humans, ecology and the environment.

In relation to agrarian reform, conventional forestry will not accommodate the socio-cultural interests of communities. Therefore, social forestry knowledge has been identified as an entry point to forest land governance and distribution for community prosperity. Social movements in Indonesia from the colonial era to the present have continuously fought for land ownership equity, mainly for oppressed farmers who have been deprived of their rights to live properly. But the distribution of state lands from the country to the citizens has been challenged by the state's right to control the lands for the global economy and other national purposes stated in the 1945 Constitution Article 33, such as the need for

agricultural land and forest land. This has led to social and practical challenges to the implementation of pro-community forest management.

The community-based forest management paradigm ensures justice, democracy, openness, anti-corruption and community welfare. Therefore, agrarian reform and natural resources management can be implemented in phases. Social forestry and agrarian reform are expected to have a strong link, so that social forestry can be implemented based on agrarian reform⁷¹.

In the period from 2007 to 2014, a range of regulations were promulgated to support the role of communities in forest management, with regulations related to Community

⁶⁹Wiratno, 2017.

⁷⁰BPS, 2020

⁷¹Awang, 2010

Forests (HKm),⁷² Village Forests (HD),⁷³ Forestry Partnerships (*Kemitraan Kehutanan*),⁷⁴ and Community Plantation Forest (HTR)⁷⁵. All are forms of empowerment. In this period, the process of granting legal access to forest resources to communities was relatively slow, with few permits being issued. Those that were issued covered a total area of 455,744 hectares, of which 78,072 hectares were HD, 157,868 hectares were HKm, 201,091 hectares were HTR, and 18,712 hectares were Forestry Partnership.

Under the administration of President Jokowi, social forestry has been much more oriented toward community welfare.

⁷²Peraturan Menteri Kehutanan No. P.37/Menhut-II/2007 tentang Hutan Kemasyarakatan.

⁷³ Peraturan Menteri Kehutanan No. P.49/Menhut-II/2008 tentang Hutan Desa.

⁷⁴Peraturan Menteri Kehutanan No. P.39/Menhut-II/ 2013 tentang Pemberdayaan Masyarakat setempat melalui Kemitraan Kehutanan.

⁷⁵Peraturan Menteri Kehutanan No. P.23/Menhut-II/2007 tentang Tata Cara Permohonan Izin Usaha Pemanfaatan Hasil Hutan Kayu dalam Hutan Tanaman Rakyat dalam Hutan Tanaman.

The 2015 to 2019 target set by RPJMN for the awarding of Social Forestry licenses is 12.7 million hectares. An indicative map of Social Forestry areas (*Peta Indikatif dan Areal Perhutanan Sosial*, PIAPS) was developed and published in January 2017 and since then has been updated every six months. The latest PIAPS is Revision V, issued 21 April 2020 (see Figure 4.1).

Achievements under Social Forestry increased significantly between January 2015 and May 2020. During this period, permits issued to communities to manage forests reached 3,692,131.43 hectares, consisting of 1,526,128.15 hectares for Village Forests (HD), 613,460.33 hectares for Community Forests (HKm), 151,419.34 hectares for Community Plantation Forests (HTR); 415,439.65 hectares for Forestry Partnerships, 26,127.49 hectares for the Social Forestry Utilization Permits (IPHPS); 44,629.34 hectares for *Adat* Forests, and 914,927.13 hectares for the appointment of *Adat* Forests. With the assistance of a new regulations on Social Forestry, most of these

permits were awarded in 2018 to 2019 (see Figure 4.2). From the inception of the Social Forestry program until May 2020, the total number of permits awarded have covered 4,147,875.30 hectares, under 6,620 separate decrees, reaching 857,819 households.

From 2015 to the present, social forestry regulations and procedures have been simplified and rules of implementation have been made complete, including regulations on the recognition of *Adat* rights and protection of *Adat* communities under the Ministry of Environment and Forestry Regulation on *Adat* Forest and Right Forest⁷⁶, and the Ministry of Environment and Forestry Regulation on Forest Land Tenure Conflict Management⁷⁷. A Ministry of Environment and Forestry Regulation on Social Forestry in Perhutani

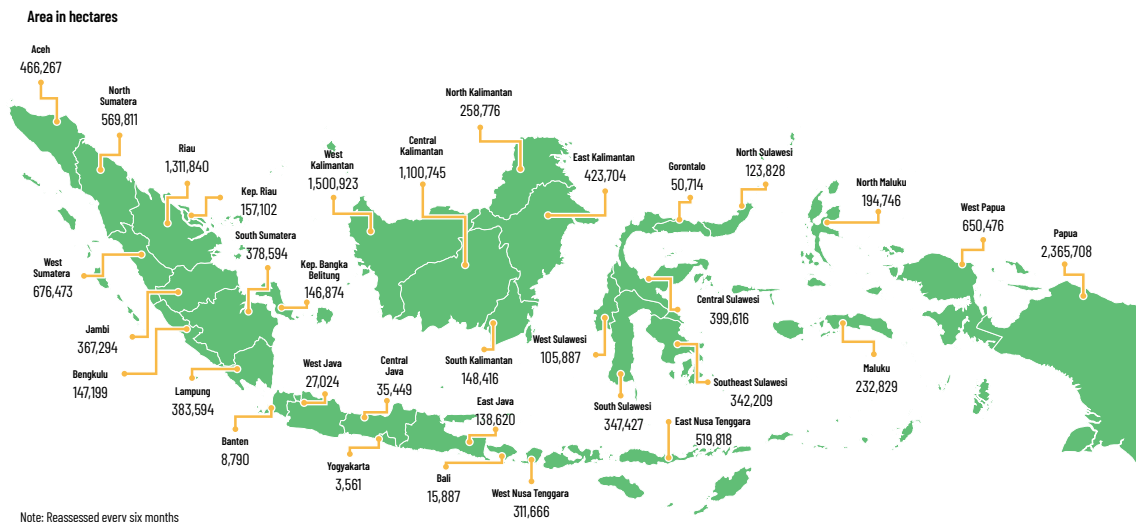
Working Areas⁷⁸ has also been issued to provide community access to forest lands on Java Island.

Social Forestry Policy provides solutions to unemployment, to poverty, to land conflicts, for the rehabilitation of lands and restoration of landscapes, and provide a sense of security and peace of mind to communities by providing them with legal of access to forest resources and the Forest Area. Success stories in the implementation of Social Forestry schemes including Sungai Buluh Village Forest, Laman Satong Village Forest, community forests in Sikka District, East Nusa Tenggara, Hutan Desa Namo, the Forestry Partnership with LMDH Wonolestari in Lumajang, East Java (see Box 4.2), the Ammatoa Kajang *Adat* Forest (see Box 4.3), and the Forestry Partnership in Teluk Jambe.

⁷⁶ Peraturan Menteri LHK No. P.21/MENLHK/SETJEN/KUM.1/4/2019 tentang Hutan *Adat* dan Hutan Hak.

⁷⁷ Peraturan Menteri LHK No. P.84/MENLHK-SETJEN/2015 tentang Penanganan Konflik Tenurial Kawasan Hutan.

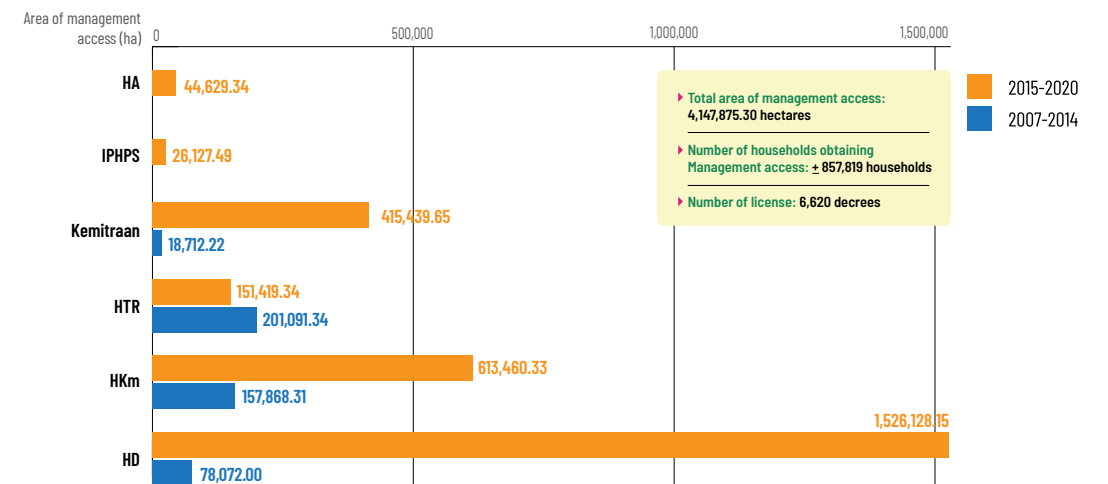
⁷⁸ Peraturan Menteri LHK No. P.39/MENLHK/SETJEN/KUM.1/6/2017 tentang Perhutanan Sosial di Wilayah Kerja Perum Perhutani.



Note: Reassessed every six months

SOURCE: KLHK, 2020f.

► FIGURE 4.1 Indicative map of social forest areas, revision V



SOURCE: KLHK, Data as of May 2020.

► FIGURE 4.2 Progress of social forestry licensing areas and access by communities

BOX 4.1

The *Adat* Law Community of Tae

One is met by the smell of durian on entering the village of Tae. Almost every family in Tae Village has a durian garden in the Tae *Adat* Forest area with the physical characteristics and taste. The Tae *Adat* Forest located in Tae Village, Balai Subdistrict, Sanggau District, West Kalimantan Province. The village of Tae can be reached in about 4 hours by road from the capital city of the province, Pontianak. The Tae *Adat* Forest was established based on a decree of the Minister of Environment and Forestry issued in 2018. The decree states that of the Tae *Adat* Forest totals 2,189 hectares. Of that, 704 hectares is protection forest, 1,209 hectares is production forest, and 276 hectares is for other uses (APL).

The Tae *Adat* Forest is managed by the Ketemenggungan Tae *Adat* law community (*Masyarakat Hukum Adat* or MHA) led by Tumenggung Tae. Historically, the people in Ketemenggungan Tae are Dayaks of the Tae ethnicity. The Tae are a Dayak sub-tribes which live in the Bukit Tiong Kandang area, alongside the Tae river, which flows down from the Tiong Kandang hills. According to the history told by the local village elders, the Tae Dayaks are the descendants of "Pet Merute," also referred to by the Dayak as "Son of Lato."

The area of the Ketemenggungan Tae includes several hamlets located around the Tiong Kandang hills, including long houses in Tae, Mak Ijing, Teradak, Padang, Petengah Tae, Serinyok, Penyakat, Lakakng, Semangkar, and Bangkan. The population of all these hamlets is 1,670 people (432 households), with the majority of people working in dryland agriculture (rainfed rice fields), crops, rubber, durian, and various other plants. A series of customary rules set out customary values, institutions for daily life, natural resource ownership systems, patterns of inheritance of natural resources, traditional technology and equipment for natural resource management, patterns of settlements and farming patterns, and customary laws (*adat*) and sanctions.

Flora found in the Tae *Adat* Forest include many with substantial commercial value, including *durian*, *tengkawang*, *aren*, *langsat*, mangosteen and so on. Fauna found in this location includes squirrels, monkeys, deer, birds, porcupines, boars, and so on. "Heaven's durian on equatorial earth," is a good way to describe the Tae *Adat* Forest, with all its natural and cultural richness – one worthy of being a new tourist destination in West Kalimantan.



PHOTOS BY: I Gusti Ngurah Wahyu Eko Adi Permadi (2019)

BOX 4.2

Forestry Partnership Provides Access to Success
Wono Lestari, Lumajang, East Java

A Forestry Partnership scheme provides access for 940 hectares of Perhutani forest to the Forest Village Community Institution (*Lembaga Masyarakat Desa Hutan*, LMDH) Wono Lestari, which benefits 661 community members. Follow-up support from the Government ensures institutional strengthening, security of the area, business governance, financial access and productive economic equipment for a range of Social Forestry Business Groups (KUPS). It is expected that economic prosperity of members of the KUPS of LMDH Wono Lestari will improve.

KUPS at LMDH Wono Lestari include:

- A Dairy Farm (see photo on left)
- Handmade Batik (see photo in middle)
- Snack chip processing (see photo on right)

Environmental Services - Water is an environmental service that can be obtained by protecting the forest ecosystem. At LMDH Wono Lestari, a spring in the forest provides water to 462 houses and 42 companies surrounding the forest. A KUPS has been managing this spring water, channeling it to users, and collecting IDR 10,000 monthly from each household, and IDR 20,000 monthly from each company, for maintenance and management.



PHOTOS BY: Biro Perencanaan, KLHK (2019)

BOX 4.3 The Spirit of Adat Law Protects Kajang's Forests

The determination of an *Adat* Forest requires a series of long processes, involving various stakeholders, just to achieve recognition of such an *Adat* territory. In Ammatoa Kajang, an important part of the process was the visit of the Minister of Environment and Forestry on August 8, 2016, to ensure comprehensive decision making in the determination of *Adat* Forests. At the end of her visit, the minister told villagers, “the process at Minister of Environment and Forestry is complete. I will schedule a meeting with the President to discuss this. There is no doubt for me that we must establish the Ammatoa Kajang *Adat* Forest.”

The spirit brought by a typical *Adat* Law Community (MHA) to managing an *Adat* forests is all about protecting forest areas from various threats. The threats are now increasing to the point that the local culture and natural resources of some MHA are in danger of fading to the point that those MHA will longer exist and be forgotten forever. The process of modernization is becoming difficult to avoid, and brings with it changes that could erase some MHA.

The Kajang community has an *Adat* belief called “passang,” a simple life, far from greed for worldly things, and more concerned with certain aspects of life, such as the obligation to protect and care for the forest, and other natural resources. For people of Kajang, the forest is a symbol of stairs that enable the soul to descend from heaven down to earth, and then re-ascend from the earth back to the sky. Forests are the place used for connecting between the supernatural and the real world. According to Kajang *Adat* Community Belief, their main village of Tana Toa is the birthplace of the first humans (Tutowa Mariolo, Mula Tau, and Ammatoa).

Humans are required to maintain the biodiversity of the forest and its surroundings, as it is considered a gift from Turie A'ra'na (God). This belief helps the natural environment to be protected. Both the Kajang *Adat* Community and outsiders are required to take off any footwear when entering “Kajang Dalam” customary territory. This is based on the Kajang *Adat* Community's philosophy that the earth is a mother (Naiya Anronta) so that between humans and the earth there must be fusion, and no separation.



Left: Official visit of Siti Nurbaya, Minister of Environment and Forestry, to Ammatoa Kajang *Adat* Forest, Bulukumba.

Upper right: *Possi Tana*, the center of the earth according to Ammatoa Kajang *Adat* Community Belief.

Lower right: The Ammatoa Kajang *Adat* Community's Sacred House located in Kajang Luar (Lpantarrang Embayya) *Adat* Territory, Bulukumba District, South Sulawesi Province.

PHOTO BY: Dit. PKTHA. (2016)

In addition to using the Indicative Map of Social Forestry Areas (PIAPS) as a guide, to ensure the acceleration of Social Forestry targets by 2019, a Social Forestry Sites Blueprint has been created and is being used as a detailed working platform. Working Groups for the Acceleration of Social Forestry (POKJA PPS) will be established in each province to spearhead the acceleration of Social Forestry at the grass roots level. As of December 2020, 33 POKJA PPS have been established throughout Indonesia.

Other notable efforts to support social forestry are the work of the Social Forestry Community Business Group, and the application of the mechanism of detasering to accelerate social forestry. Detasering in the local government context means facilitating access to forests for communities and assisting in the development of social forestry businesses. At the field level, detasering implies directly accompanying social forestry practitioners.

4.1.1 Community Economic Stimulus - “Bang Pesona”

Facilitation has been provided by the Ministry of Environment and Forestry to community groups who have obtained social forestry permits for business development, institutional capacity building, and entrepreneurship – especially in relation to the formation of Social Forestry Community Business Group (KUPS). Economic stimulus is also provided through *Bang Pesona*, as is equipment for productive economy activities. Because of limitations on the government in providing funding support directly to social forest community, partner organizations are invited to directly support social forestry schemes.

There are two consecutive programs launched by the Ministry of Environment and Forestry to implement productive

economy policy in social forestry areas. The Conservation Based Rural Community Forestry Development (PPMPBK) pilot program was implemented from 2015 to 2017. It has now been formalized into regular program called *Bang Pesona* -- Social Forestry Development in the Archipelago -- since 2017. Through *Bang Pesona*, the government supports the provision of goods, seedlings, livestock, fish, and equipment for social forestry businesses, to stimulate the improved business capacity of social forestry participants, and ultimately to contribute to public welfare.

In 2015, support for PPMPBK was delivered through 1,988 packages, valued at IDR 50 million per package. In 2016 and 2017, support decreased to 800 and 300 packages, respectively. But in 2018, support increased to 800 packages, and increased again to 1700 packages in 2019. This dynamic was due to budget availability, but the support per package remain constant at IDR 50 million.

Productive economic equipment was also provided to KUPS (see Box 4.2 above), with the aim of improving the capacity of KUPS to manage natural-resource linked businesses, such as timber, NTFP, ecosystem services, and ecotourism. Types of equipment provided were for cultivation, harvesting, and processing NTFP, or supporting ecosystem services such as ecotourism development, water utilization, and even carbon sequestration. The equipment provided was based on proposals submitted by KUPS. This initiative was started in 2017 with 544 different tranches of equipment delivery, increasing to 1,075 tranches in 2018, 2,316 in 2019. Delivery has fallen off sharply in 2020, due to the COVID-19 pandemic.

The State Bank Association (HIMBARA) has also contributed to social forestry development in Indonesia, through financial facilitation. Included in HIMBARA

are three large state-owned banks, BNI, Mandiri and BRI. In several districts in East Java province (Tuban, Bojonegoro, Madiun, Tulungagung, Blitar, Malang, Lumajang, Jember and Probolinggo), BNI has provided *Kredit Usaha Rakyat* (KUR, or People's Business Loans) to individual farmers. Mandiri has provided capital support and linked KUPS with off-takers who are expected to buy their products, and with insurance institution to insure against possible crop failures. Facilitation, cash management services and CSR are also provided by Mandiri to shrimp farmers in Muara Gembong, whose shrimp ponds cover 17.2 hectares. Meanwhile, BRI has provided KUR to social forestry farmer groups in Boyolali, Pemalang, Blora, and Pati districts in Central Java to support corn commodity development. In the same districts, the Ministry of Environment and Forestry's BLU P2LHP provided KUR for timber commodity development.

Seedlings to support community forest and land rehabilitation were also provided by the People's Nursery (KBR) development program. The seedlings can also be used for planting by social forestry permit holders, e.g. in Community Forests (HKm) holding IUPHKm licenses and in Village Forests (HD) holding Village Forest Management Rights.

Amid the COVID-19 pandemic, President Joko Widodo has directed that the condition of rural communities be maintained, especially small businesses, cooperatives and forest farmer groups, so they can continue to produce and receive income from the sale of products. Upon receiving these directions, the Ministry of Environment and Forestry has begun to purchase products from forest farmers, to be distributed to medical personnel on duty at the front lines handling COVID-19, and at the same time supporting medical staff who need strength and endurance. Among the products are instant ginger

tea (*jahe instan*), *wedang uwuh*, *temulawak*, honey, cajuput oil (*minyak kayu putih*), ground palm sugar (*gula semut*), and other foods and beverages high in Vitamin C. These products are purchased from the Social Forestry Business Group (KUPS) throughout Indonesia, and distributed free of charge to medical personnel who are struggling to treat COVID-19 patients in hospitals. This incidental program that started in March 2020 has a total budget of almost USD 50,000. Minister Siti said, "We continue to encourage forest farmers to increase their production, because people are interested in buying these products. This way the people's economy continues to move forward amid challenges faced from the Corona pandemic."

4.1.2 Pesona Festival

A Pesona (Social Forestry in the Archipelago) Festival was designed as a place to bring together Social Forestry and Environmental Partnership stakeholders, e.g. Government Ministries/Institution, NGOs, entrepreneurs, POKJA PPS, Social Forestry participants (community groups), the banking sector, etc. This Festival began in 2016, and has been held annually since then. In 2019, the festival featured exhibitions, talk shows, a debate championship, as well as cultural performance from various *Adat* communities were held. To attract youth, a "record-a-VLOG-on-the-spot" contest was part of the activities. To recognize the efforts of important figures fighting for social forestry, Social Forestry awards are given by the Minister. The festival promotes local products and food security, and exhibits Forestry Cuisine, Forest Healing, and a Forest Spa.



► FIGURE 4.3 Rice terraces that spoil our eyes, Banten. PHOTO BY: PSKL (2019)

4.1.3 Social Forests: Food Security Barns for Community Welfare

Social forestry is a national priority program to sustainably manage forests for community welfare, including through agroforestry, where people obtain income generation from forest products (timber), agricultural inter-cropping, and plantations. Within the 4.1 million hectares of social forestry licenses awarded so far, food is grown on 285,530 of those hectares, across 30 provinces.

The Ministry of Environment and Forestry, in collaboration with the State Forestry Corporation 'Perhutani' and the Ministry of Agriculture, recently initiated the Social Forestry Food Security Program. This program aims at ensuring the inclusion of community groups in social forestry programs, and providing rice and corn development assistance, production inputs and equipment, technical

assistance in cultivating rice and corn, and post-harvest production.

The Social Forestry Food Security Program is implemented through planting crops in the context of agroforestry system in the Forest Area in Java as well as in the Outer Islands. The Forest Area in Java is suitable for planting rice and corn amongst trees. Potential areas for planting rice and secondary food crops in Java cover 196,240 hectares. Of this, a total of 106,212 hectares has been identified so far, including 30,400 hectares suitable for the planting of corn in Social Forestry areas, 15,553 hectares and 60,259 hectares, respectively suitable for the cultivation of rice and corn inside Perhutani management areas. Meanwhile, potential areas for development of agroforestry with elements of rice and food crops in the Outer Islands include 46,672 hectares within Community Forests (IUPHKm), and 72,950 hectares within Village Forests.

The COVID-19 pandemic has increased the need for food and industrial raw materials, while the supply has declined. The Social Forestry's Food Security Program that has been started prior to the pandemic is an opportunity to increase food supply, to create employment of people living around the Forest Areas, and one of the solutions to mitigate the economic and social impacts of the COVID-19 pandemic.

4.1.4 Remote Teaching during the COVID-19 Pandemic

During the COVID-19 pandemic, many community activities on the ground have been halted. Adapting to a health protocol that restricts the holding of meetings that gather crowds, the Ministry of Environment and Forestry initiated a social forestry remote teaching program. The program was well accepted by communities (see Box 4.4).

BOX 4.4 The Remote Teaching on Social Forestry during the COVID-19 Pandemic

The Ministry of Environment and Forestry has conducted remote teaching activities on social forestry during the COVID-19 pandemic. The teaching is intended to ensure that social forestry program implementation continues during the pandemic. The activities started from the preparation, and continue on through implementation and, evaluation, until graduation, when participants are awarded certificates. Teaching took place online from 27 April to 18 June 2020 with 25 hours of instruction, and was attended by more than 3,000 participants from all over Indonesia. The participants divided into 100 groups with as many as 30 participants per group.

The requirement to "stay at home" is intended to break the chain of transmission of COVID-19, causing almost all routine activities to cease. The pandemic reduced the enthusiasm for work of many forest farmers in Indonesia. Remote teaching on social forestry served to greatly increase the enthusiasm of forest farmers to keep on learning during the pandemic.

Feedback from the Tandung Billa Forest Farmer Group in Palopo, South Sulawesi, was that this remote teaching had great value. The only complaint, which sometimes arose, was in relation to poor internet connections, especially for participants who were located in "remote areas" in Sulawesi, Maluku and North Maluku. When participants had internet connection problems, they would immediately move to other locations, until they would find a better connection, and would then continue the class.

On the last day of the learning process, all participants received copies of the instructional materials, and obtained final scores for their homework. Some obtained perfect scores. Participants hope to apply to their daily activities what they have learned from remote teaching, and to follow up with knowledge exchanges with farmers in other regions, in order to learn from one another.

4.2 Recognition of Adat Forest

Adat Forest is a social forestry scheme where the forest is located in an *Adat* Law Community's area. According to the Forestry Act,⁷⁹ *Adat* Forests are a part of the Forest Area. However, the Constitutional Court called into question this aspect of the Forestry Law, and deemed that *Adat* Forest is a part of Rights Forests (*Hutan Hak*)⁸⁰. In recognition of the Constitutional Court's decision, the Ministry of Environment and Forestry issued a regulation in 2015 concerning Rights Forests.⁸¹

Applications for the recognition of *Adat* Forest may be submitted by the representatives of *Adat* communities (*Masyarakat Hukum Adat*, MHA) to the Minister of Environment and Forestry, once the MHA has been recognized through a district-level regulation and/or a decree of the district head. The application will then be verified and validated on the basis of technical considerations. Following the verification and validation process, an *Adat* Forest will be designated according to its function. The extent of designated *Adat* Forest will be based on the capacity of the *Adat* community in managing the forest and forest products, and the intensity of the community's interactions with the forest.

Adat Forest must be managed in accordance with its original designated function. Thus, if the forest was originally categorized as a Protection Forest, then the *Adat* community may be permitted to collect non-timber forest products, but not to harvest timber. Likewise, if the area was

a Conservation Forest, activities permitted will be those allowed in Conservation Forest areas. Meanwhile, if the forest originally functioned as a Production Forest, the *Adat* community is permitted to cut trees, but only after submitting a long-term management plan and annual workplan which justifies the amount of timber to be felled each year. This accords with the stipulation of the Ministry of Environment and Forestry Regulation concerning *Adat* Forest and Right Forest,⁸² Article 16, Paragraph (1) point e, which states that one of the rights of *Adat* Forests and Rights Forests owners is to utilize timber and non-timber forest products as well as environmental services based on forest functions and arrangements, as stipulated in laws and regulations.

The process of classifying *Adat* Forests is still ongoing. President Joko Widodo presented a document recognizing nine *Adat* Forests, covering a total area of more than 13,000 hectares, at the State Palace on 30 December 2016.

Since then, progress in the area of *Adat* Forests continues. Although this is not always easy, open discussions are now taking place between the government (Ministry of Environment and Forestry), sub-national governments and representatives of *Adat* communities. The results of those discussions need to be continuously followed up. As of December 2019, there were 914,927 hectares of *Adat* territory which have been managed by 94 communities incorporated in the Indicative *Adat* Forests (SK.10292/MENLHK-PSKL/PKTHA/PSL.1/12/2019).

In order to achieve final recognition as *Adat* Forests, the next step is for Indicative *Adat* Forests to undergo technical reviews and verification. The final result, it is

⁷⁹Undang-Undang Republik Indonesia No. 41 Tahun 1999 tentang Kehutanan.

⁸⁰Putusan Mahkamah Konstitusi No. 35/PUU-XI/2012 tentang Tanah Hak Ulayat Masyarakat Hukum Adat.

⁸¹Peraturan Menteri LHK No. P.32/Menlhk-Setjen/2015 tentang Hutan Hak. This regulation then repealed and replaced by Peraturan Menteri LHK No. P.21/MENLHK/SETJEN/KUM.1/4/2019 tentang Hutan Adat dan Hutan Hak regulating both *Adat* Forest and Right Forest.

⁸²Peraturan Menteri LHK No. P.21/MENLHK/SETJEN/KUM.1/4/2019 tentang Hutan Adat dan Hutan Hak.



Air Terjun Benang Kelambu

LOCATION
Desa Aik Berik,
Lombok Tengah District,
West Nusa Tenggara

PHOTO BY
KPHL Tastura

hoped, will be the formal stipulation of these areas as *Adat* Forests.

As of May 2020, about three and a half years from the first recognition of nine *Adat* Forests in December 2016, an additional area of 44,629 hectares have been stipulated as *Adat* Forests. The stipulated *Adat* Forests are managed by 36,579 *Adat* households and *Adat* Forests and are located in 13 provinces: West Sumatra, South Sumatra, Riau, Jambi, South Sulawesi, Central Sulawesi, West Java, Central Java, Bali, Banten, West Kalimantan, Central Kalimantan, and East Kalimantan Provinces (see Appendix 5).

4.3 Protection Forest Management with the Participation of Communities

Forest Management Units (*Kesatuan Pengelolaan Hutan*, KPH) are the most devolved government units to be directly involved in the management of Indonesian forests. The Protection Forest Management Unit (*Kesatuan Pengelolaan Hutan Lindung*, KPHL) has functions related to the protection of the forest, the regulation of water management, the prevention of floods, the control of erosion, the prevention of sea water intrusion and the maintenance of soil fertility. KPHL also facilitate community participation in programs related to the collection and utilization of non-timber forest products and the provision of environmental services.

At the site level, protection forest management units assist communities to utilize the protection area to support their welfare, and involve these communities in supporting forest protection. Case studies of community level participation in forest protection include the Biak Numfor Protection Forest Management Unit in Papua Province (Box 4.5). At the site level, protection forest

management units assist communities to utilize the protection area to support their welfare, and involve these communities in supporting forest protection. Case studies of community level participation in forest protection include Biak Numfor Protection

Forest Management Unit in Papua Province (Box 4.5).

BOX 4.5

Protection Forest Management at KPHL Biak Numfor, Papua

One main issue within West Papua's 206,016 hectare Biak Numfor Protection Forest Management Unit (KPHL Biak Numfor), which is 58 percent comprised of Protection Forest, is human-caused forest degradation and deforestation linked to illegal logging. Concerning this issue, KPHL Biak Numfor collaborates with other related stakeholders to facilitate community conflict resolution. It is believed that local community involvement and participation in sustainable forest management of KPHL Biak Numfor can be more harmoniously achieved if the community stops cutting down trees inside the KPHL. Based on KPHL Biak Numfor's strategic business plan established in 2015, KPHL Biak Numfor instead authorizes local communities to focus on managing ecotourism and utilizing non-timber forest products from the forest.

In 2017, the local community of Sepse agreed to stop illegally cutting trees inside the state-owned protection forest, and committed to manage ecotourism activities at Opersnondi Lake and Samares Beach. The Ecotourism Team of the Customary Community of Marga Ansek is now responsible for both potential ecotourism operations. To assist their efforts, the Head of Biak District has also committed to supporting and developing certain improvements at Opersnondi Lake and Samares Beach. Opersnondi Lake (also known as the Blue Lake) is in Sepse Village, and is not far from Samares Beach, East Biak. The blue water of the lake is believed to possess sacred powers that will drown people who swim on lake if they have committed bad deeds, especially recently. Some say this is just a myth, but that it may be worth believing it, because it deters people from committing bad deeds. The local community also believes the lake's water has the ability to preserve things that fall into the lake. Some adults maintain that objects which fell into the lake while they were children have not changed. Meanwhile, Samares Beach, with its clean blue ocean water, is used by the local community to fish. Both of these attractive, must-visit places in Papua have become more and more popular among local and international tourists.

Furthermore, KPHL Biak Numfor has been rehabilitating 1,080 ha of degraded and deforested areas with a mix of wood species and multi-purposes trees species (MPTS). MPTS trees are valuable for non-timber forest products such as cajuput oil. There are 3 (three) villages surrounding KPHL Biak Numfor that have been assigned as centers for Cajuput Oil development, the villages of Adibai and Sundei in East Biak share 15 ha of the KPHL, and the the village of Warsansan in North Biak has access to a different area of 15 ha. Since 2019, Adibay community has been able to process and produce Cajuput Oil under the "Farkin" brand. It sells for IDR 20,000 for a 30-mililiter bottle.

In addition to cajuput oil, there are many other NTFPs that have been utilized by communities surround KPHL Biak Numfor, e.g. damar gum from the *Agathis sp.* plant, the ant-house plant (*Myrmecodia sp.*), red fruit (*Pandanus conoideus*), cotton (*Gossypium sp.*), and forest honey.



Sightseeing on Padar Island

LOCATION
Padar Island, Komodo National Park,
East Nusa Tenggara

PHOTO BY
Iskandar Kamaruddin (2019)

CHAPTER 5

Strengthening Biodiversity Conservation and Ecosystem Management

Indonesia has 554 designated conservation areas spread throughout all provinces of the country, covering 5.3 million hectares of marine conservation areas and 22.1 million hectares of terrestrial conservation areas. The majority of this area (59.79 percent) is designated as National Parks. Some conservation areas have been recognized globally, with six World Heritage sites; 22 Biosphere Reserves; six ASEAN Heritage Parks, seven Ramsar sites, and four Global Geoparks. This global recognition is evidence of the significant value of Indonesia's forests to the world. Indonesia's conservation areas are comprised of 4.25 million hectares of Strict Nature Reserves (*Cagar Alam*, CA); 4.98 million hectares of Wildlife Sanctuaries (*Suaka Margasatwa*, SM); 306,060 hectares of Sanctuary Reserve Areas/Nature Conservation Areas (*Kawasan Suaka Alam/Kawasan Pelestarian Alam*, KSA/KPA); 16.23 million hectares of National Parks (*Taman Nasional*, TN), 825,000 hectares of Nature Recreation Park (*Taman Wisata Alam*, TWA); 171,250 hectares of Game Hunting Parks (*Taman Buru*, TB), and 371,120 hectares of Grand Forest Parks (*Taman Hutan Raya*, Tahura).

Around 6,381 villages are located in or around these conservation areas. A number of entities and organizations have proposed that some of these areas, covering around 1.65 million hectares, be designated as *Adat Territory (Wilayah Adat)*, with 134 specific proposals requesting this designation. Most of the proposed territories are located in National Parks, including in Lore Lindu National Park (108,691 hectares); Betung Kerihun National

Park (193,716 hectares); Sebangau National Park (137,570 hectares); and Kayan Mentarang National park (750,773 hectares).⁸³

Conservation areas face significant and complex pressures, many of which have the potential to result in the degradation and fragmentation of habitat, leading to the so-called "Ecological Island" phenomenon. A recent study published by Ministry of Environment and Forestry identified a 'open' (unforested) Conservation Forests totaling around 1.8 million hectares (KLHK, 2020g). These open areas were the result of fires as well as encroachment for plantations, dryland farming, illegal logging, and illegal mining.

⁸³Wiratno, 2019.



Banteng (*Bos javanicus*): An endangered species recorded as native resident of Indonesia's Kalimantan, Java, and Bali were grazing in the savanna ecosystem.

LOCATION
 Savanna Sadengan, Alas Purwo National Park, East Java

PHOTO BY
 Asep Ayat (2006)

Working to solve these issues with the help of key stakeholders living near Conservation Forests, such as villagers, the private sector, CSOs and local universities, is the new preferred approach.

Including communities as key partners is very important in terms of being able to identify solutions to conservation forest and development challenges, and implement those solutions together in a collaborative way. There are three main principles of collaborative management: mutual respect, trust, and benefit. This approach can help conservation area managers improve their relationships with local communities. Problems such as encroachment, illegal logging and poaching can often be solved through dialogues, and through raising awareness of win-win solutions through alternative activities such

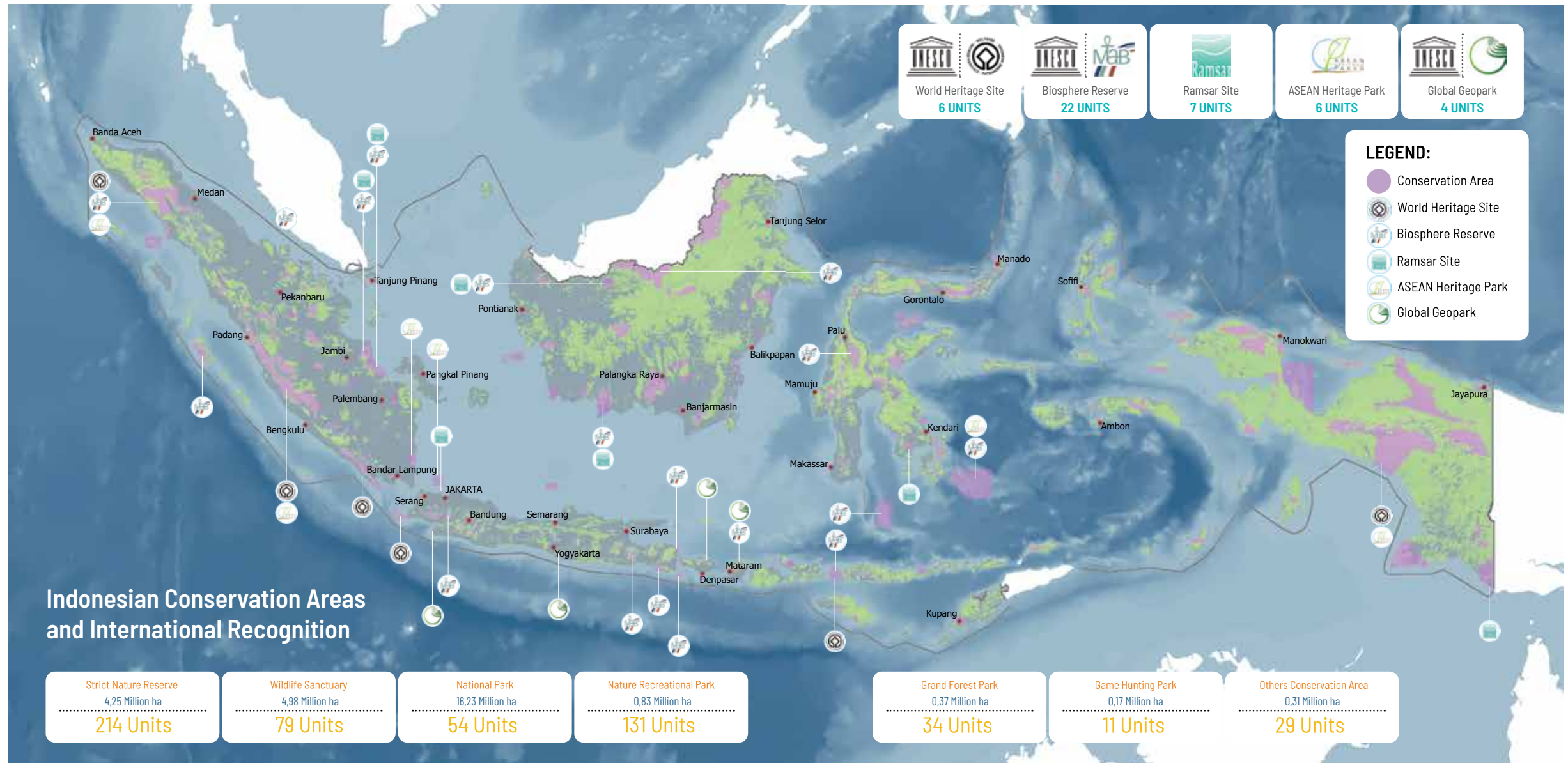
as the management of non-timber forest products, the restoration of degraded areas, the development of ecotourism, the development of mini hydro, and the creation of other small-scale enterprises based on local community empowerment.

Such efforts require strong leadership at all levels, and require that management be more open-minded, more inclusive, and open to new innovations. One notable innovation is the introduction of micro hydro power plants, which action research has found to increase communities' positive perceptions toward the benefits of forests, and to encourage community participation in the preservation of forest functions. The results of this innovation have been utilized and replicated by various parties, especially Regional Forestry Offices, Natural Resources Conservation Agencies

(BKSDA), and National Park Agencies in various regions in Indonesia, among others: Central Sulawesi BKSDA, South Sulawesi BKSDA, South Sulawesi BBKSDA, Bukit Baka Bukit Raya, Manusela NP, Matalawa NP, Bogani

Nani Wartabone NP, and the Central Sulawesi Forestry Service. With the tagline “Terang Desaku, Lestari Hutanku” (My Village is Well-Lit, My Forest is Everlasting), micro hydro power plants not only light rural areas, but also

to increase the possibility of adding value to agricultural products by making extra cheap electricity available for modest downstream processing activities.



5.1 Resort-Based Management of Conservation Areas

The management of Indonesian conservation areas uses the resort-based management (RBM) model. The resort-based management is a tool employed by conservation area authorities to understand the field situation, comprehend the diversity of problems and the potency of various places, and to understand the cultural diversity and the history of the relationship between local communities and Conservation Forests. When the local community supports Conservation Forest management, this is an indication of improved collective awareness and it can be considered a sign of initial success in building social capital. When the local community obtains benefits from the Conservation Forest, it will guard and treat that forest as an asset that has to be protected and managed wisely. Local wisdom of local communities, including *Adat* Communities, are in fact fully in line with the modern conservation concepts. Thus, there is no reason for not working hand in hand with local communities that live nearby (or inside) Conservation Forests across the country. The objective of the resort-based system is to improve the effectiveness of the area management. This model has facilitated the development of a transparent, effective and efficient management culture, with cooperation between all stakeholders, and appropriate mechanisms for recording, documenting and resolving conflicts.

5.2 The Management of Plants and Wildlife

In 2018, the Ministry of Environment and Forestry helpfully issued a regulation to protect 116 plant species and 788 wildlife species.⁸⁴ Of these, 25 are endangered wildlife species which are targeted by a population increase program (see Table 5.1). In the period of 2015-2019, the target was a 10 percent increase of endangered populations based on a 2013 population baseline.



Tarsius fuscus, one of 12 endemic tarsiers of Sulawesi

LOCATION
Bantimurung Bulusaraung National Park,
South Sulawesi

PHOTO BY
Iskandar Kamaruddin (2012)

► **TABLE 5.1** List of 25 endangered wildlife species prioritized for conservation

No.	Wildlife Species	Scientific name
1	Sumatran tiger	<i>Panthera tigris sumatrae</i>
2	Sumatran elephant	<i>Elephas maximus sumatrensis</i>
3	Javan & Sumatran rhinoceros	<i>Rhinoceros sondaicus</i> and <i>Dicerorhinus sumatrensis</i>
4	Banteng	<i>Bos javanicus</i>
5	Gibbon and Siamang	<i>Hylobates</i> sp. and <i>Symphalangus sindactylus</i>
6	Orangutan	<i>Pongo</i> sp.
7	Proboscis monkey	<i>Nasalis larvatus</i>
8	Komodo dragon	<i>Varanus komodoensis</i>
9	Bali myna	<i>Leucopsar rothschildi</i>
10	Maleo	<i>Macrocephalon maleo</i>
11	Hairy babirusa	<i>Babyrousa babyrussa</i>
12	Lowland anoa and Mountain anoa	<i>Bubalus depressicornis</i> and <i>Bubalus quarlesi</i>
13	Javan Hawk-eagle and Flores Hawk-eagle	<i>Nisaetus bartelsi</i> and <i>Nisaetus floris</i>
14	Cockatoo	<i>Cacatua</i> sp.
15	Javan leopard	<i>Panthera pardus melas</i>
16	Bawean deer	<i>Axis kuhlii</i>
17	Bird of Paradise	<i>Paradisaea</i> sp. and <i>Seleucidis melanoleuca</i>
18	Surili	<i>Presbytis fredericae</i> and <i>Presbytis comata</i>
19	Tarsier	<i>Tarsius fuscus</i>
20	Celebes crested macaque and Celebes macaque	<i>Macaca nigra</i> and <i>Macaca maura</i>
21	Sumba hornbill	<i>Rhyticeros everetti</i>
22	Purple-naped lory	<i>Lorius domicella</i>
23	Hawksbill Turtle and Green Turtle	<i>Eretmochelys imbricata</i> and <i>Chelonia mydas</i>
24	Dingiso	<i>Dendrolagus mbaiso</i>
25	Rinjani scops owl	<i>Otus jolandae</i>

Efforts to increase the population of these prioritized endangered wildlife species have included: conducting population inventories and monitoring; habitat management; conducting awareness campaigns; implementing measures to improve the protection and security of these species; establishing conflict resolution mechanisms; and facilitating the rescue, rehabilitation and

release of wildlife illegally held in captivity, as well as the development of monitoring database. Increases to these population have been achieved through birth either in their natural habitats (*insitu*) or in captivity (*exsitu*).

In the aftermath of the nine successful births of endangered wildlife species in 2017, the average increase during that year across Indonesia's 25 most prioritized endangered

⁸⁴ Peraturan Menteri LHK No. P.106/MENLHK/SETJEN/KUM.1/12/2018.

species was 0.82 percent. Then in 2018, the average rate of increase of those 25 more than quadrupled to 3.67 percent. The increase was due to births that year among 19 of Indonesia's prioritized endangered wildlife species, namely: Sumatran Elephants, Rhinos, *Banteng*, Gibbons, Orangutans, Proboscis Monkeys, Javan Hawk-Eagles, Yellow Crested Cockatoos, Javan Leopards, Bawean Deer, Birds of Paradise, *Surili*, Tarsiers, Sulawesi Black Monkeys, Sumba Hornbills, Purple-Naped Loris, Hawksbill and Green Turtles, and Rinjani Scops Owls. Among the endangered species born in 2018 was a Proboscis Monkey in the Yokohama Zoo, which is part of breeding loans collaboration program between Indonesia and Japan.

During 2019 and 2020, there were 101,240 individual wildlife species were recorded to have been born. In 2019, it was reported two

Sumatran elephants born in Way Kambas National Park, four Javan rhinos born in Ujung Kulon National Park, four Banteng born in Meru Betiri National Park, Baluran National Park, and Kayan Mentarang National Park, one Javan hawk-eagle hatched in Gunung Gede Pangrango National Park, and seven orangutans born in Sumatra and Kalimantan. Based on the results of population monitoring that is routinely carried out in Komodo National Park, the population of Komodo dragons increased from 2,897 in 2018 to 3,022 individuals by the end of 2019, an increase of 125 individuals (4.31 percent) in the population. The 2020 saw the birth of two Javan rhinos. As of August 2020, the Javan Rhino population is 74 individuals, consisting of 40 males and 34 females, 15 of which are calves and the remaining 59 are juveniles or adults.

Since 2015 the Indonesian government in collaboration with other countries has successfully rescued 19 Orangutans that were victims of the illegal wildlife trade, and accepted repatriations from Thailand and Kuwait. The repatriations were from Thailand in December 2019, when two Orangutans were returned (see Box 5.1). From 2015 to 2019, repatriations to Indonesia totaled 1,795 individual animals.

In the period 2015 - 2019, wildlife rescue activities and releases into the wild were also undertaken. During this period, a total of 917 wild animals were rescued, and 101,061 individual animals were released into the wild. These activities involved 29 special conservation institutions, consisting of nine Animal Rescue Centers, 12 Animal

Rehabilitation Centers and 8 Special Wildlife Animal Training Centers.

Conservation consists of three main activities: protection, study, and sustainable utilization. Sustainable utilization of wild plant and wildlife species is subject to the provisions in Government Regulation 8 of 1999 concerning utilization of wild plant and animal species. The forms of utilization are divided into eight categories, namely: ARD (assessment, research, and development); captivity; hunting; trade; demonstration; exchange; cultivation of medicinal plants; keeping as pets. In the period of 2015-2019, non-tax state revenue (PNBP) generated from the utilization of wild plants and wildlife amounted to IDR 99.5 billion, and the foreign exchange of exports over that same period amounted to IDR 43.1 trillion.



► **FIGURE 5.1** Five months old male Sumatran Orangutan (*Pongo abelii*) and his 27 years old mother were found by a monitoring patrol team in August 2020. **PHOTO BY:** Khalidin/YEL-SOCP, BKSDA Aceh, and DJKSDAE (2020).

BOX 5.1

Repatriation of Two Orangutans from Thailand

On December 20, 2019 two orangutans were returned home. They are named Cola (10 years) and Giant (7 years). They were returned from Thailand, and they arrived at Soekarno-Hatta International Airport.

Cola is the offspring of an orangutan named Khai Kem who had previously been repatriated from Thailand to Indonesia in 2015, while Giant is suspected of having been smuggled from Indonesia and was discovered in Petchaburi Province by local authorities. Based on the results of DNA tests that have been carried out, Cola is known to be a species of Borneo orangutan (*Pongo pygmaeus*) while Giant is a species of Sumatran orangutan (*Pongo abelii*). Based on DNA testing, age, behavior and health examination results, the two orangutans are believed to be capable of undergoing a rehabilitation process at the Animal Rehabilitation Center before being released into the wild, in accordance with the natural habitats of each of the orangutan. Cola will be entrusted to the Center for Orangutan Protection which has an Orangutan Animal Rehabilitation Center facility in Berau, East Kalimantan, in order to undergo the rehabilitation process before being released back to its natural habitat.

The 2018 saw the births of many endangered species originally from Sumatra, at General Conservation Institutes across the rest of Indonesia. For example, Sumatran Orangutans were born at LK Bali Safari and Marine Park and Jakarta's Ragunan Wildlife Park, while a Sumatran Tiger was born at East Java's Maharani Zoo. In 2018, births were recorded of 12 of the 25 endangered species in 13 General Conservation Institutes. In 2019, births were recorded of six of the 25 endangered species, including Sumatran elephants, Javan Rhinos, Banteng, Javan Hawk-Eagle, Orangutans, and Hawksbill and Green Turtles.

5.3 High Conservation Value Areas

Underlining the importance of a balanced space to live for all living things of the planet, Indonesia implements One Health concept at different levels. At the ecosystem level, Indonesia has designated around 51 million hectares protected areas (27,34 million hectares of mostly terrestrial areas managed by the Ministry of Environment and Forestry and 23,38 million hectares of mostly marine areas managed by the Ministry of Marine Affairs and Fisheries). Indonesia is also enhancing the function of High Conservation Value Forest (HCVF) identified within resource concessions and consolidating fragmented habitats for purposes of species survival.

One of the Aichi Biodiversity Targets to which Indonesia agreed is the setting aside of 17 percent of its land area (or 32 million hectares) for terrestrial conservation. Currently, Indonesia has just over 22 million hectares set aside for this purpose, and is likely to miss this target by 10 million hectares. One possible way to fill this gap is to establish new conservation areas under governmental management.⁸⁵

5.4 Community-Based Management of Conservation Areas

A large proportion of Indonesia's population still remains significantly dependent on forest resources. Of the 74,954 villages in Indonesia, more than 25,800 villages, or 34 percent of the total, live in or at the edges of the Forest Area. Of those, 6,381 villages are located inside or at the fringes of the nearly 22 million hectares of Conservation Forest, with a significant proportion of the population of these villages dependent on forest resources for their livelihoods. Community-based forest conservation management can be achieved by developing community-based eco-tourism activities, as has been the case in: Tangkahan, Gunung Leuser National Park; Bukit Seribu Bintang, Gunung Ciremai National Park; Gunung Tunak Nature Recreation Park; and Sebangau National Park.

5.5 The Use of Traditional Zones in Partnership with Communities

In the period from 2015 to 2019, conservation programs have been conducted to enable communities to access and utilize non-timber forest products in traditional zones of National Parks. These zones may be utilized for the benefit of communities that have customarily been dependent on the utilization of these natural resources. The purpose of these programs is to develop these communities' economic autonomy and to improve the welfare of their members so they can better support the sustainability of

the conservation areas. As of December 2019, partnerships in traditional zone utilization covered more than 579,207 hectares of traditional zones in the nation's conservation areas. Access to natural resources in these zones has been facilitated through 193 partnership arrangements, signed between community representatives and various Heads of National Parks Offices (*Balai Taman Nasional*) (see Table 5.2).

► TABLE 5.2 Partnership arrangement in the traditional zones of national parks

Year	Number of Partnership Arrangements	Extent of area covered (in Ha)	Number of villages	Number of beneficiaries (households)
2015	2	387.50	8	53
2016	11	787.45	16	290
2017	24	64,096.71	31	2,294
2018	43	10,570.15	37	1,723
2019	113	503,365.73	100	3,743
Total	193	579,207.54	192	8,103

SOURCE: KLHK, Data up to December 2019

⁸⁵ Consultation with stakeholders is being made for discussing responsibility of conserving biodiversity at non-State Forest Areas. While this is a responsibility of Indonesian people, the high conservation value of forests which are located outside the State Forest Areas could have been brought into the conservation areas management under Government authorities.

Box 5.2 Harmonization of the Nature and Culture in Kelimutu National Park

The charm and beauty of Lake Kelimutu National Park⁸⁶ derives from the fact that its three lakes are all different colors, and even those can change. The changes in the colors of the three lakes is caused by the mineral composition of the three lakes. The three lakes are named Tiwu Ata Polo (red lake), Tiwu Nua Muri Koo Fai (blue lake), and Tiwu Ata Mbupu (white lake). The combined area of the three lakes is 1,051,000 square meters. It is believed that Tiwu Ata Polo is a place for souls of dead criminals, that Tiwu Nua Muri Koo Fai is for the souls of those who died young, and Tiwu Ata Mbupu is for the souls of those who passed away at an old age.

Additional to Lake Kelimutu, Kelimutu National Park is an interesting place for ecotourism activities that built through the community-based tourism program. Visitors could enjoy the beauty of nature, stay in community homestays, engage with local community daily activities (such as going to the fields, drying or pounding paddy rice with the community), and visiting several tourist objects located at surrounding the locations.

Kelimutu National Park is also a customary area for the Lio community of around 21 traditional villages led by a customary leader called a Mosalaki. The relationship between the people of Lio (living around the buffer area of the Kelimutu National Park) with Lake Kelimutu is very close. The community believes that the spirits of their ancestors reside in Lake Kelimutu.



The Three-color lake, Kelimutu National Park, East Nusa Tenggara

PHOTO BY: Saud Oloan Simamora, 2018.

Through partnership arrangements in Traditional Zones, 8,103 households in 192 villages have seen their welfare improve. These arrangements enable community members in and around Betung Kerihun Danau Sentarum National Park, for example, to utilize non-timber forest products such as honey, pine resin, resin, dragon blood, medicinal plants, rattan, illipe nut, mushrooms and forest fruits. The collection of non-timber forest products has become the biggest proportion of the partnership arrangements in providing access to Traditional Zones to communities in villages inside and surrounding Betung Kerihun Danau Sentarum and Gunung Palung National Parks in West Kalimantan, Gunung Halimun Salak and Gunung Gede Pangrango National Parks in West Java, Bukit Barisan Selatan National Park in South Sumatra, Ujung Kulon National Park in Banten, Gunung Merbabu National Park in Central Java, Manupeu Tanadaru and Laiwangi Wanggameti National Parks in East Nusa Tenggara, and Bukit Baka Bukit Raya National Park in Central Kalimantan. In addition to enabling community members to collect non-timber forest products, these arrangements provide access to community members to harvest fish and other aquatic fauna; to cultivate agricultural and estate crops commodities; or develop nature tourism services.

5.6 International Commitments to the Conservation of Biodiversity

As a mega-biodiversity country, Indonesia plays a highly strategic role in the international arena to preserve biodiversity. Indonesia has ratified a number of international agreements and conventions related to biodiversity, including the Convention on

Biological Diversity (CBD),⁸⁷ the UNESCO Man and Biosphere Program (MAB), the World Heritage Convention,⁸⁸ the Convention on the International Trade of Endangered Species of Wild Fauna and Flora (CITES),⁸⁹ and the Ramsar Convention (the Convention on Wetlands of International Importance as Waterfowl Habitat).⁹⁰

5.6.1 Convention on Biological Diversity

Indonesia ratified the Convention on Biological Diversity (CBD) in 1994.⁹¹ At the national level, the convention is implemented through the Indonesian Biodiversity Strategy and Action Plan (IBSAP), which is valid for the period from 2015 to 2020. The IBSAP for 2015-2020 was formulated by updating parts of the IBSAP for 2003-2020 document, which had in turn updated the 1993 Biodiversity Action Plan (BAPI). In addition to updated data, IBSAP 2015-2020 includes greater information on ecosystems and subtaxons, freshwater and marine ecosystems, wildlife, plant genetic resources, and microbes. The IBSAP 2015-2020 also addresses issues related to challenges of maintaining biodiversity, the economic contribution of biodiversity, the use scientific and technological innovations in the management of biodiversity, and climate change. It also describes the need for data, information, and better

⁸⁷ Undang-Undang Republik Indonesia No. 5 Tahun 1994 tentang Pengesahan United Nations Convention on Biological Diversity (Konvensi Perserikatan Bangsa-Bangsa mengenai Keanekaragaman Hayati).

⁸⁸ Keputusan Presiden Republik Indonesia No. 26 Tahun 1989 tentang Pengesahan Convention Concerning The Protection of The World Cultural and Natural Heritage.

⁸⁹ Keputusan Presiden Republik Indonesia No. 43 Tahun 1978 tentang Convention on International Trade in Endangered Species of Wild Fauna and Flora.

⁹⁰ Keputusan Presiden Republik Indonesia No. 48 Tahun 1991 tentang Pengesahan Convention on Wetlands of International Importance especially as Waterfowl Habitat.

⁹¹ Undang-Undang Republik Indonesia No. 5 Tahun 1994 tentang Pengesahan United Nations Convention on Biological Diversity (Konvensi Perserikatan Bangsa-Bangsa mengenai Keanekaragaman Hayati).

⁸⁶ Lake Kelimutu National Park is located at Ende District, Flores Island of East Nusa Tenggara Province.



Essential Ecosystem: Landscape of Maros-Pangkep karst area with its high conservation value has been legally protected and managed as an Essential Ecosystem Area (*Kawasan Ekosistem Esensial*) based on South Sulawesi Regulation No. 3 of 2019

LOCATION
Pangkep, South Sulawesi

PHOTO BY
Usman Arifin (2011)

institutional and managerial resources. These new topics served as an input for the formulation of policies, strategies, national targets and action plans related to the management of biodiversity in Indonesia in the period up to 2020. In addition, the provincial government of South Sumatra has compiled and published a sub-national IBSAP document, entitled the South Sumatra Biodiversity Strategy and Action Plan/SSBSAP (*Strategi dan Rencana Aksi Keanekaragaman Hayati Sumatera Selatan/SeHati Sumsel*) (2017-2021).

Indonesia submitted its 6th National Report to the Secretariat of the CBD in 2019. This National Report explains the extent to which Indonesia has implemented the Convention's Aichi Biodiversity Targets, which will end in 2020. The National Report of each country will be used as information for the CBD Secretariat to review the extent of achievement of the Aichi Biodiversity Targets globally, and for the preparation of the 5th Global Biodiversity Outlook. Indonesia's 6th National Report measures achievements of national targets that were determined in the 2015-2020 Indonesian Biodiversity Action Plan (IBSAP). The Report shows

that Indonesia's efforts to achieve these targets are mostly completed.

Indonesia has also ratified a number of agreements related to the CBD Convention, including the Cartagena Protocol on Biosafety in 2004,⁹² and the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits arising from the Utilization of Biodiversity Resources in 2013.⁹³ As a manifestation of its commitment to the Cartagena Protocol, Indonesia established a Biosafety Clearing House in 2001, even before it ratified the Protocol in 2004. In 2010, Indonesia established the Biosafety Commission for Genetically Engineered Products (*Komisi Keamanan Hayati Produk Rekayasa Genetik*), which is directly responsible to the President. To support the implementation of the Nagoya Protocol, in 2018, the

⁹² Undang-Undang Republik Indonesia No. 21 Tahun 2004 tentang Pengesahan Cartagena Protocol on Biosafety to the Convention on Biological Diversity (Protokol Cartagena tentang Keamanan Hayati atas Konvensi tentang Keanekaragaman Hayati).

⁹³ Undang-Undang Republik Indonesia No. 11 Tahun 2013 tentang Pengesahan Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from Their Utilization to Convention on Biological Diversity (Protokol Nagoya tentang Akses Pada Sumber Daya Genetik dan Pembagian Keuntungan yang Adil dan Seimbang yang Timbul dari Pemanfaatan atas Konvensi Keanekaragaman Hayati).

Ministry of Environment and Forestry issued a Regulation concerning Access to the Genetic Resources of Wild Species and Profit Sharing from their Utilization.⁹⁴

As a further manifestation of the Government's commitment to the CBD Convention, a Biodiversity Clearing House (BK Kehati), as mandated by the Convention, was established in 2002 by the Ministry of Environment and Forestry. A BK Kehati working group, which consists of representatives of a number of ministries and institutions, was established in 2016.⁹⁵

During the CBD's COP 14 held in November 25, 2018 in Sharm el-Sheikh Egypt, Indonesia received a Gold Award from CBD Secretariat. This award is a formal recognition and encouragement to CBD member countries for their development and improvement of their Clearing House Mechanisms, which function as information sources on the implementation of the CBD at the national level.

⁹⁴ Peraturan Menteri LHK No. P.2/Menlhk/Setjen/KUM.1/1/2018 tentang Akses pada Sumber Daya Genetik Spesies Liar dan Pembagian Keuntungan atas Pemanfaatannya.

⁹⁵ Keputusan Menteri LHK No. SK.755/Menlhk/KSDAE/KUM.0/9/2016.

5.6.2 The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)

CITES is an international agreement aimed at ensuring that trade in plant and/or wildlife species does not threaten these species' existence.⁹⁶ Indonesia became a member of CITES in 1975, and ratified the Convention in 1978, with implementation commencing in 1979.⁹⁷ Indonesia currently plays a strategic role as a member of the Standing Committee, the Animals Committee and as an alternate member of the Plants Committee as a representative from the Asia region. Indonesia also serves on CITES Tree Species Advisory Committee. The Ministry of Environment and Forestry is the national focal point for management authority, while the Indonesian Institute of Sciences (LIPI) is the national focal point for scientific authority. To strengthen the implementation of the CITES mechanism,

⁹⁶ <https://www.cites.org/eng/disc/what.php>

⁹⁷ Keputusan Presiden Republik Indonesia No. 43 Tahun 1978 tentang Convention on International Trade in Endangered Species of Wild Fauna and Flora.

other agencies are also involved, including the National Police, the Office of the Attorney General, the Supreme Court, the Army, Customs, the Ministry of Marine Affairs and Fisheries, the Ministry of Trade, as well as the private sector.

As mandated by the Convention, Indonesia has established a regulatory framework to implement the CITES, with Indonesia's framework being classified as Category 1, the highest category. In 2019 and 2020, there are 4,381 species of Indonesian species of plants and wildlife listed in CITES Appendix I, II, and III⁹⁸. The wild harvest of some plants and animals in CITES Appendix II are regulated in Indonesia with annual quotas, which have affected 118 species in 2019, and 120 species in 2020⁹⁹.

5.6.3 The Ramsar Convention (The Convention on Wetlands of International Importance as Waterfowl Habitat)

Indonesia ratified the Ramsar Convention in 1991,¹⁰⁰ with implementation commencing in 1992. Signatories to the Ramsar Convention are obliged to register at least one wetland site of international significance as waterfowl habitat. To date, seven Indonesian wetland sites have been designated as Ramsar sites, these being in Berbak National Park (1992), Danau Sentarum National Park (1994), Wasur National Park (2006), Rawa

Aopa Watumohai National Park (2011), Sembilang National Park (2011), Pulau Rambut Wildlife Sanctuary (2011) and Tanjung Puting National Park (2013). The total area covered by these seven sites is 1,372,976 hectares.

5.6.4 UNESCO Man and Biosphere Programme (MAB)

The CBD Convention serves as an umbrella for the conservation of biodiversity at the global scale. However, before ratifying this convention in 1994, 22 years earlier, Indonesia had already committed itself to the Man and Biosphere Programme (MAB), conceived by UNESCO in 1968 and launched in 1971.¹⁰¹

Indonesia formed the Indonesian National Committee for the MAB Programme in 1972. In 1974, the concept of the Biosphere Reserve was developed, followed by which the World Network of Biosphere Reserves in 1976. In 1977, four Indonesian conservation areas were designated as Biosphere Reserves (*Cagar Biosfer*, CB), these being Cibodas/Gunung Gede Pangrango, Komodo, Lore Lindu, and Tanjung Puting, all of which have since been formally categorized as National Parks.

Over time, seven new locations were designated as biosphere reserves, these being Siberut National Park (1981), Gunung Leuser National Park (1981), Giam Siak Kecil-Bukit Batu Biosphere Reserve (2009), Wakatobi National Park (2012), Bromo Tengger Semeru National Park (2015), Taka Bone Rate National Park (2015) and Belambangan Biosphere Reserve (2016). This brought the total number of biosphere reserves in Indonesia to 11. Then in 2017, three additional biosphere reserves were

proposed, these being Berbak Sembilang, Rinjani Lombok, and Betung Kerihun-Danau Sentarum. Decisions related to this matter were taken at the 30th International Co-ordinating Council on Man and the Biosphere (ICC MAB) in 2018. By mid-2020, the number of conservation areas in Indonesia designated as biosphere reserve areas had reached 22.

5.6.5 ASEAN Heritage Parks

As a member of the ASEAN, the Republic of Indonesia participates in the ASEAN Heritage Parks program, which is a regional cooperation program for ASEAN Member States committed to effectively managing selected and representative conservation areas within the jurisdiction of member countries, which then become the legacy of ASEAN.

Conservation areas that have the status of ASEAN heritage must be managed within the framework of maintaining ecological processes and life support systems, preserving genetic diversity, ensuring the sustainable use of species and ecosystems, and preserving the natural values of landscape, cultural and tourist values. The nomination of a conservation area as ASEAN Heritage Parks must meet several criteria, namely:

1. Ecological completeness - retaining natural ecological processes and the ability to regenerate through minimal human intervention.
2. Representativeness - diversity of ecosystems, or specific/endemic species of a particular region.
3. Naturalness - in natural conditions such as forests, coral reef formations, with natural processes that are still ongoing.

4. High conservation importance - with global influence on the conservation of important or valuable species, ecosystems, or resources, and capable of generating a sense of community respect for nature, and a feeling of loss when those natural conditions disappear.
5. Legally confirmed - in a legally-gazetted area.

At present, Indonesia has 7 conservation areas that have the status of ASEAN Heritage Parks, namely:

1. Gunung Leuser National Park (Register No. 2), listed in 1984
2. Kerinci Seblat National Park (Register No. 3), listed in 1984
3. Lorentz National Park (Register No. 4), listed in 1984
4. Way Kambas National Park (Register No. 36), listed in 2015
5. Kepulauan Seribu National Park (Register No. 39), listed in 2017
6. Wakatobi National Park (Register No. 40), listed in 2017
7. Bantimurung Bulusaraung National Park (Register No. 41) listed in 2018.

The listing of a conservation area as an ASEAN Heritage Park is a regional effort to support improved management of protected areas and promote these protected areas at regional and global levels. Other benefits gained include increasing human resource capacity and funding support through the Small Grants Program.

⁹⁸ https://www.speciesplus.net/#/taxon_concepts?taxonomy=cites_eu&geo_entities_ids=16&geo_entity_scope=cites&page=1

⁹⁹ Keputusan Direktur Jenderal KSDAE No.SK.441/KSDAE/SET/KSA.2/12/2018 tanggal 31 Desember 2018 tentang Kuota Pengambilan Tumbuhan Alam dan Penangkapan Satwa Liar Periode Tahun 2019; Keputusan Direktur Jenderal KSDAE No.SK.1/KSDAE/KKH/KSA.2/1/2020 tanggal 2 Januari 2020 tentang Kuota Pengambilan Tumbuhan Alam dan Penangkapan Satwa Liar Periode Tahun 2020.

¹⁰⁰ Keputusan Presiden Republik Indonesia No. 48 Tahun 1991 tentang Pengesahan Convention on Wetlands of International Importance especially as Waterfowl Habitat.

¹⁰¹ <http://www.unesco.org/new/en/natural-sciences/environment/ecological-sciences/man-and-biosphere-programme/>

TIGER CONSERVATION LANDSCAPES

To prevent the decline of the population of Sumatran tigers, habitat management must be done through a landscape approach. Therefore, tiger conservation practitioners and experts have defined a series of Tiger Conservation Landscapes (TCL). Each landscape was identified based on the historical distribution of tigers, area suitability, demographic development, and several other aspects, resulting in 76 priority landscapes being identified globally. In 2006, tiger experts issued a definition of a tiger conservation landscape as a forest block which holds extant tiger population based on scientific records within the last 10 years.

TIGER CONSERVATION LANDSCAPES IN SUMATRA

Tiger experts examine tiger populations and habitat in each forest landscape to assess whether it is occupied or unoccupied by tigers. Subsequently, they carefully extrapolate tiger densities so these may be used in other landscapes, where intensive tiger population monitoring has not been conducted. To date, tigers are confirmed to be present in only 23 landscapes. According to the most recent tiger population viability analyses, the Sumatran tiger population is estimated at around 600 individuals present in small, medium and large landscapes.

TWO TYPES OF TIGER CONSERVATION LANDSCAPES

The Tiger National Strategy and Conservation Action Plan concentrates on two types of landscapes: managed and unmanaged. This differentiation is due to a growing understanding that unmanaged landscape can have more and greater challenges. Therefore, the unmanaged landscapes require more intensive conservation interventions than those that are managed.

MINIMUM VIABLE POPULATION

By integrating deforestation and illegal hunting data into their analyses, tiger conservationists can predict the future of tiger. Through population viability analyses (PVA), the probability that a tiger population that will thrive within a certain period and circumstances, is assessed.

35 

The minimum viable population in any one landscape is 35 individuals, where the landscape carrying capacity is estimated as being able to hold 70 adult tigers.

MANAGED LANDSCAPE

A government authority has an established management unit, allocated budget and a specific tiger conservation programme.

UNMANAGED LANDSCAPE

Tigers are present and the landscape may or may not be under a government management authority, and the landscape has no dedicated budget or specific tiger conservation programme.

THE LAST RESOURCE

Tiger populations in ex-situ conservation institutions will serve as the last tiger resource, if Sumatran tigers become extinct in the wild. Carefully controlled breeding programs can manage the purity of the species and prevent in-breeding, assisted with data of blood lines shared nationally and internationally. These conservation institutions are also becoming valuable resources for public education and important sites where veterinarians can learn about tiger management.

TWO TYPES OF CONSERVATION AGENCIES

GENERAL CONSERVATION AGENCIES

For general purposes, like safari parks, animal parks, and zoos

SPECIFIC CONSERVATION AGENCIES

For specific purposes, like animal rescue and animal rehabilitation

PRIMARY PRESERVED POPULATION

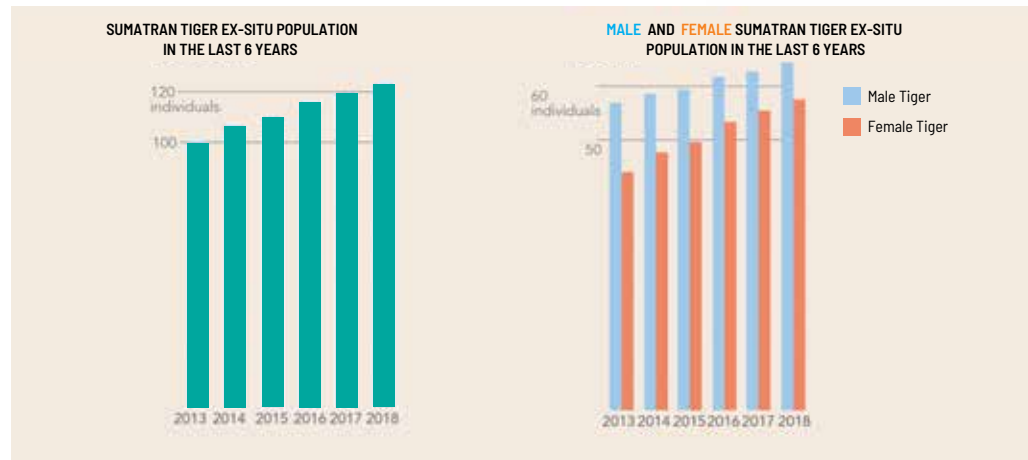
129 

at 18 conservation agencies in Indonesia

SECONDARY PRESERVED POPULATION

265 

North America, Europe, Australasia and Japan

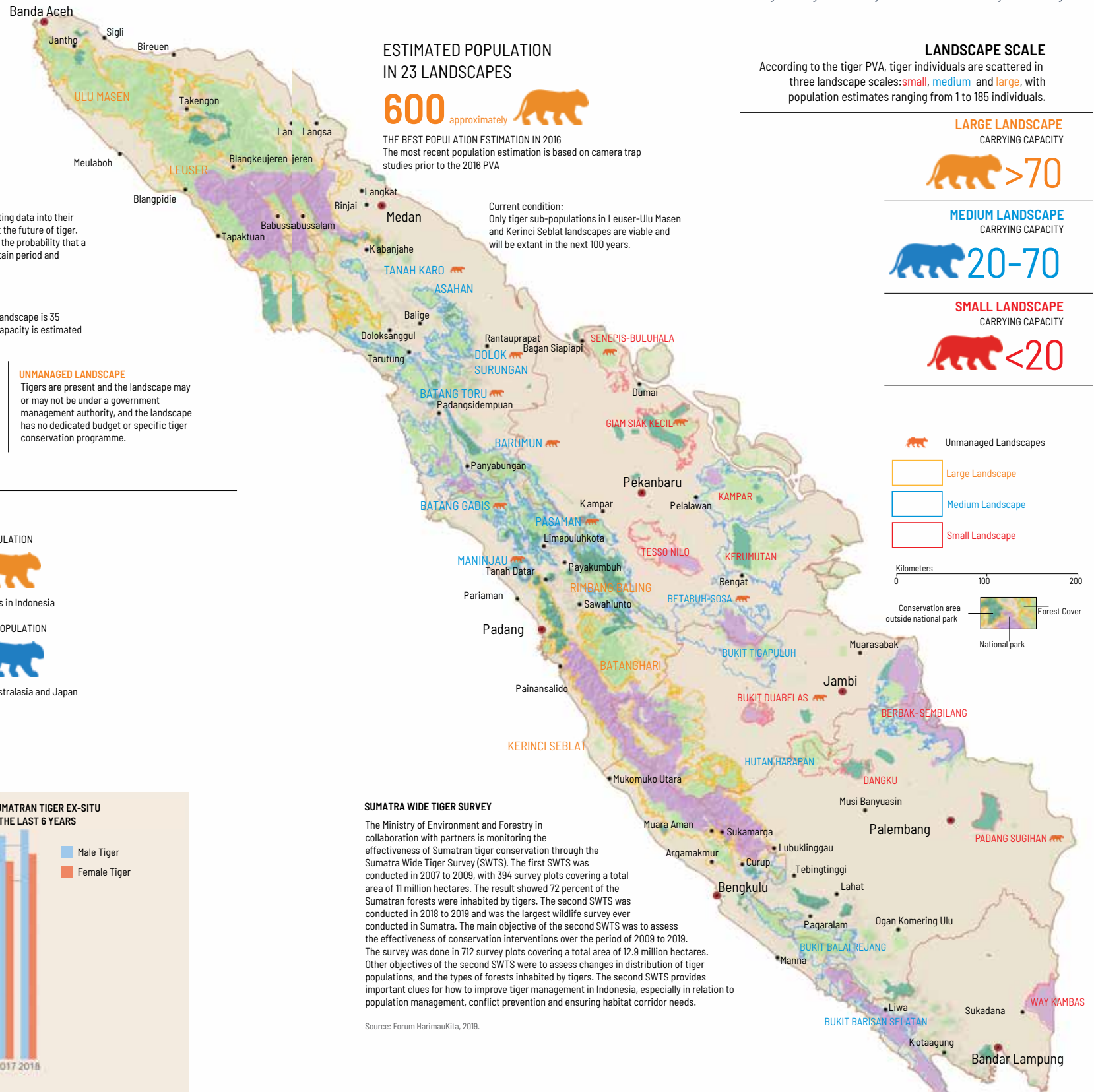


ESTIMATED POPULATION IN 23 LANDSCAPES

600 approximately 

THE BEST POPULATION ESTIMATION IN 2016
The most recent population estimation is based on camera trap studies prior to the 2016 PVA

Current condition:
Only tiger sub-populations in Leuser-Ulu Masen and Kerinci Seblat landscapes are viable and will be extant in the next 100 years.

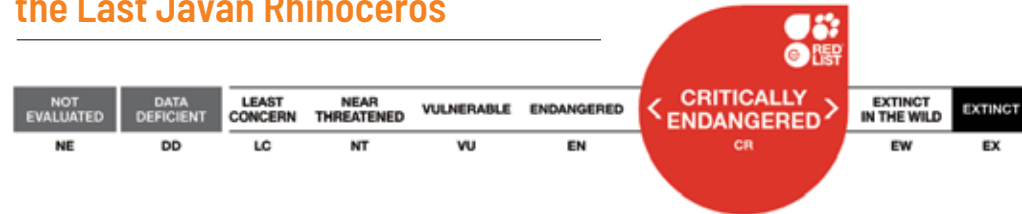


SUMATRA WIDE TIGER SURVEY

The Ministry of Environment and Forestry in collaboration with partners is monitoring the effectiveness of Sumatran tiger conservation through the Sumatra Wide Tiger Survey (SWTS). The first SWTS was conducted in 2007 to 2009, with 394 survey plots covering a total area of 11 million hectares. The result showed 72 percent of the Sumatran forests were inhabited by tigers. The second SWTS was conducted in 2018 to 2019 and was the largest wildlife survey ever conducted in Sumatra. The main objective of the second SWTS was to assess the effectiveness of conservation interventions over the period of 2009 to 2019. The survey was done in 712 survey plots covering a total area of 12.9 million hectares. Other objectives of the second SWTS were to assess changes in distribution of tiger populations, and the types of forests inhabited by tigers. The second SWTS provides important clues for how to improve tiger management in Indonesia, especially in relation to population management, conflict prevention and ensuring habitat corridor needs.

Source: Forum HarimauKita, 2019.

Population and Distribution of the Last Javan Rhinoceros

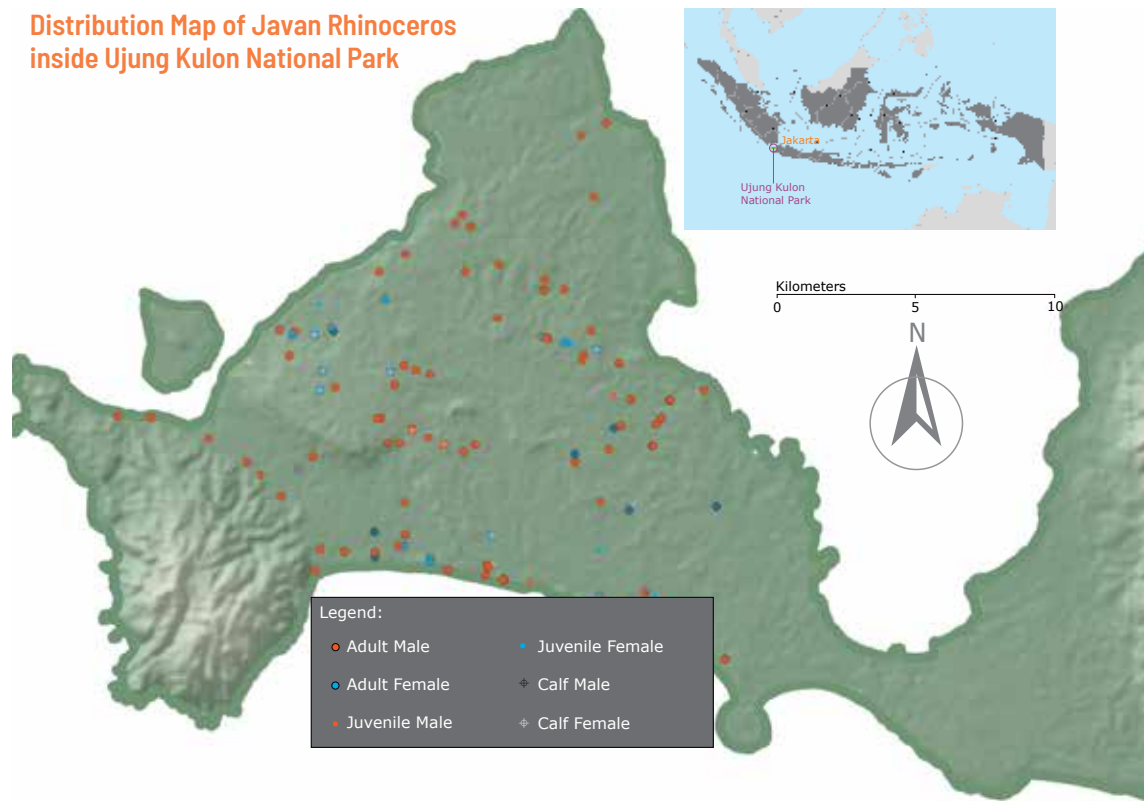


The Javan rhinoceros (*Rhinoceros sondaicus Desmarest*, 1822) is by far the rarest among the world's five species of rhinoceros. It is categorized as critically endangered in the IUCN Red List Data Book. It is also listed in the Appendix 1 of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). Javan rhinoceros is also classified as a protected species in Indonesia. At present, the Javan rhinoceros population occupies only a small part of the mainland of western Java in the Ujung Kulon National Park. It is a species that has an elusive and mostly solitary life in a dense and vast forest area, and is difficult to see directly.

Since 1967, inventories of the population of Javan rhinoceros in Ujung Kulon National Park have been carried out by looking for traces of these animals along pre-selected transect lines. As of 2010, it was estimated that the number of Javan rhino in 2010 ranged from 50 to 60 individuals. The population was believed to have stagnated since 1994. The Trace method, however, had many weaknesses, because the process of finding and identifying traces was influenced by climatic and soil factors. Moreover, only highly experienced observers could identify the traces. In addition, the Trace method may have resulted, at times, in over-estimates of the population, because the same individual could be counted repeatedly.

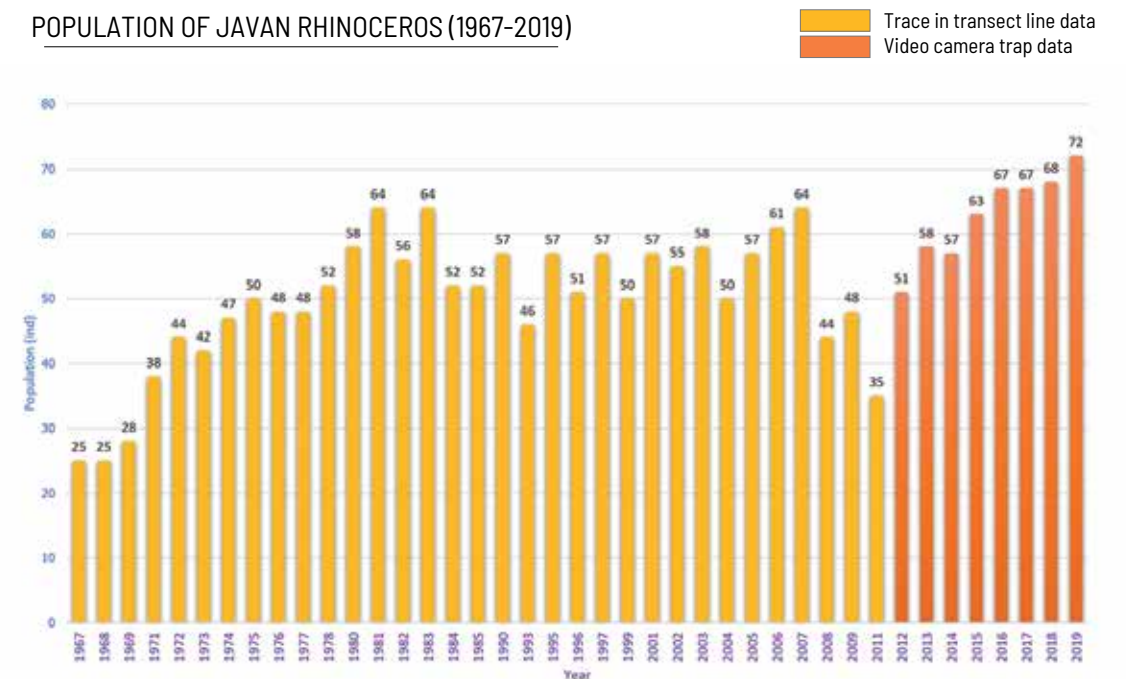
Because of these challenges, starting in 2011, inventories have been carried out using the Video Camera Trap method. Placement of video cameras is done by stratified sampling, based on areas where there are believed to be concentrations of Javan rhinoceros. In 2019, it was found that there were 72 Javan rhinoceros in Ujung Kulon National Park, 39 males and 33 females. They are 57 juveniles or adults, and 15 of them are calves.

Distribution Map of Javan Rhinoceros inside Ujung Kulon National Park



© David Herman Jaya

POPULATION OF JAVAN RHINOCEROS (1967-2019)





Komodo National Park awarded new Seven Wonders of nature in 2012. As the only natural habitat of giant reptile, Komodo Dragon (*Varanus komodoensis*), this national park is also designated as a Nature World Heritage Site.

LOCATION
Komodo National Park,
East Nusa Tenggara

PHOTO BY
Iskandar Kamaruddin (2019)

CHAPTER 6

Forests for the National Economy and the Role of the Private Sector

Sustainable production forest management is directed by strategies to increase the productivity of the forest, at times with community involvement. One of the important strategies is a multi-business process approach to produce wood-based forest products and non-timber forest products (NTFP). Community involvement is encouraged in order to increase timber production and community welfare, including through the implementation of community forest plantations (HTR) and sustainable NTFP production.

6.1 Portrait of Production Forest Management

Indonesia's Production Forest area covers a total area of 68.8 million hectares, of which 34.18 million hectares have been granted to different types of forest products licenses, while the remaining 34.62 million hectares are without such licenses. Of the 34.18 million hectares of area for which forest product licenses have been granted, 55 percent (18.8 million hectares) are under Business Licenses for the Utilization of Forest Products from Natural Forests (*Izin Usaha Pemanfaatan Hasil Hutan Kayu pada Hutan Alam*, IUPHHK-HA) and 33 percent (or 11.27 million hectares) are under Business Licenses for Utilization of Forest Products from Industrial Plantation Forests (*Izin Usaha Pemanfaatan Hasil Hutan Kayu pada Hutan Tanaman*, IUPHHK-HT). Figure 6.1 shows Indicative Utilization



A Promising Acacia Plantation

LOCATION
HTI PT Arara Abadi, Riau

PHOTO BY
SMGroup (2015)

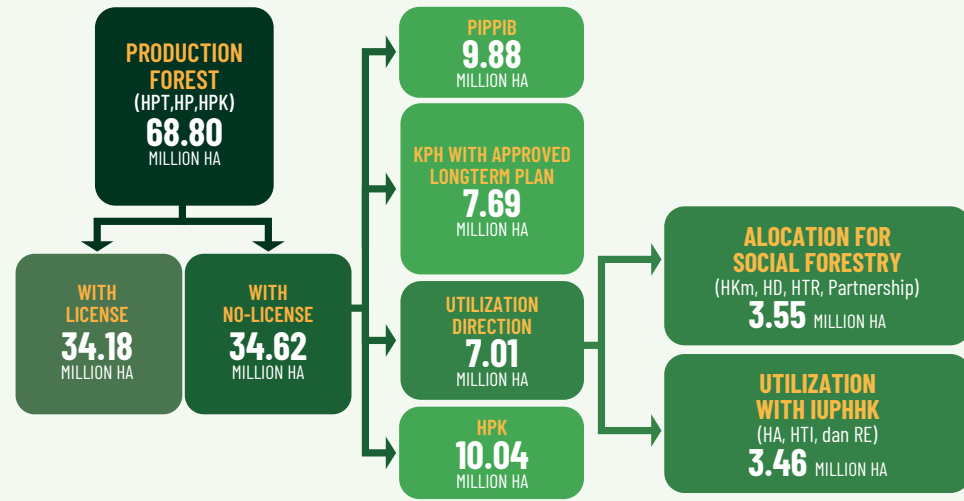
Mapping of Production Forest issued by the Minister of Environment and Forestry in 2019 for the use in 2020.

A third type of forest products license is the Business License for the Utilization of Timber Forest Products for Ecosystem Restoration (*Izin Usaha Pemanfaatan Hasil Hutan Kayu untuk Restorasi Ekosistem*, IUPHHK-RE), which stands at 2 percent (or 0.62 million hectares) of the nation's Production Forest. The last type with 10 percent (or 3.49 million hectares) devoted to collecting non-timber forest products (IUPHHBK), environmental services businesses with IUPJL license, and social forestry schemes.

IUPHHK-RE is a business license for developing the production forest area so that biodiversity and ecosystem balance can be maintained. Ecosystem restoration areas have a potentially important role to play in reducing carbon dioxide emissions and increasing the

forest's carbon stock. These will be achieved through activities such as forest rehabilitation, conservation and maintenance of the forest, which will increase the stand biomass, as well as protection from forest fires. The ecosystem restoration business is a multi-faceted business with multiple products, because it involves different types of businesses that may utilize the area, like eco-tourism, non-timber forest products, and ecosystem services. These multiple forms of businesses can operate even before ecosystem balance is restored. From 2007 to 2020, 16 IUPHHK-RE permits were granted, covering a total of 622,861 hectares in Riau, Jambi, South Sumatra, Bengkulu, West Kalimantan, Central Kalimantan and East Kalimantan provinces. Table 6.1 shows number and the extent of IUPHHK-HA, IUPHHK-HTI and IUPHHK-RE licenses granted from January 2011 to May 2020.

Forestry licenses can contribute to the climate change mitigation through carbon market schemes, including Business Licenses for Utilization of Forest for Carbon Sequestration and/or Carbon Storage (IUP RAP/IUP PAN Karbon), which are now being awarded to some businesses. Carbon sequestration can be done through planting trees, maintenance of trees, enrichment planting, and productivity improvement through improvement of the stand growth. Meanwhile, carbon storage can be done through longer cutting cycles or felling rotation, environmentally friendly felling (such as Reduced-Impact Logging), extension of protection and conservation areas inside Ecosystem Restoration concessions, and the maintenance of High Conservation Value Forest (HCVF) areas.



SOURCE: SK.10199/MENLHK-PHPL/KPHP/HPL.0/12/2019, 16 December 2019

► FIGURE 6.1 Indicative utilization mapping of production forest area for 2020

► TABLE 6.1 Number and extent of forest use licenses granted in Production Forest areas from 2011 to 2020

Year	Natural forest selective felling (IUPHHK-HA)		Industrial Plantation Forests (IUPHHK-HT)		Ecosystem Restoration (IUPHHK-RE)	
	Extent (Mha)	No. of Units	Extent (Mha)	No. of Units	Extent (Mha)	No. of Units
2011	9.17	215	9.63	233	0.2	4
2012	9.83	238	9.83	238	0.22	5
2013	21.08	277	10.11	254	0.4	9
2014	20.13	273	10.54	277	0.52	13
2015	19.2	263	10.7	280	0.55	14
2016	19.3	268	10.84	286	0.62	16
2017	18.81	259	11.18	293	0.62	16
2018	18.43	253	11.17	293	0.62	16
2019	18.86	258	11.27	294	0.62	16
2020	18.75	257	11.19	292	0.62	16

Note: Mha = millions of hectares

SOURCE: KLHK, Data as of May 2020.

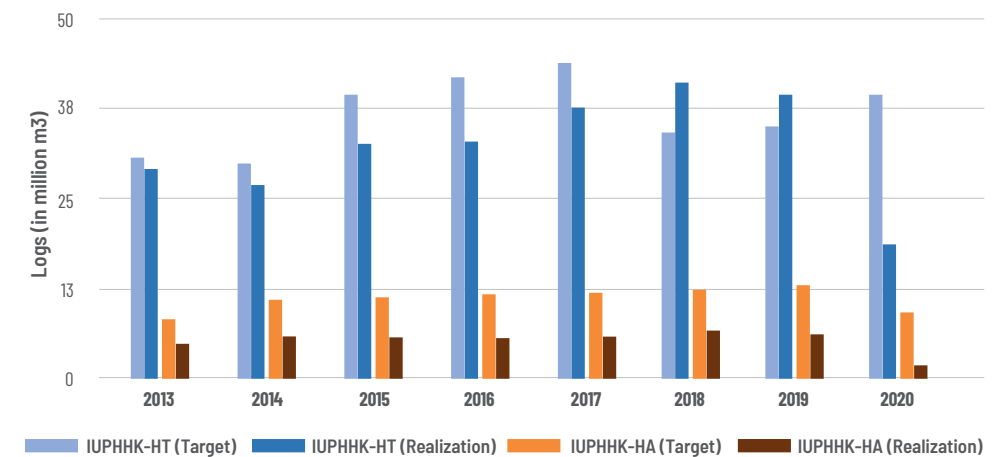
Meanwhile, the 34.62 million hectares of Production Forest that are not licensed for purposes of selective felling of natural forest timber, Industrial Plantation Forests, or ecosystem restoration, include 9.88 million hectares of primary forest that are now permanently protected by the moratorium on new forestry permits (PIPPIB), 7.69 million hectares of specific areas unburdened by licenses (*Wilayah Tertentu*, WT) within 167 Production Forest Management Units (*Kesatuan Pengelolaan Hutan Produksi*, KPHP) which already obtained approval of their Long-Term Forest Management Plans, 10.04 million hectares of Convertible Production Forest (*Hutan Produksi yang Dapat Dikonversi*, HPK), 3.55 million hectares allocated for social forestry schemes and 3.46 million hectares allocated for business licenses in the future (IUPHHK-HA/HT/RE).

Logging concessions in natural forests (IUPHHK-HA) and Industrial Plantation Forests (IUPHHK-HT) are the main producers of logs in Indonesia. Logs are still the primary commodity of these upstream industries. However, the non-timber forest products and ecosystem services are increasingly coming into focus. Figure 6.2 shows that log production from 2013 to May 2020 from natural forests was below annual targets, while production from Industrial Plantation Forests was below annual targets from 2013

to 2017, but above annual targets in 2018 and 2019. What appears to be a decline in 2020 is actually a reflection of the fact that, for purposes of this figure, data for this year was recorded only up to the month of May.

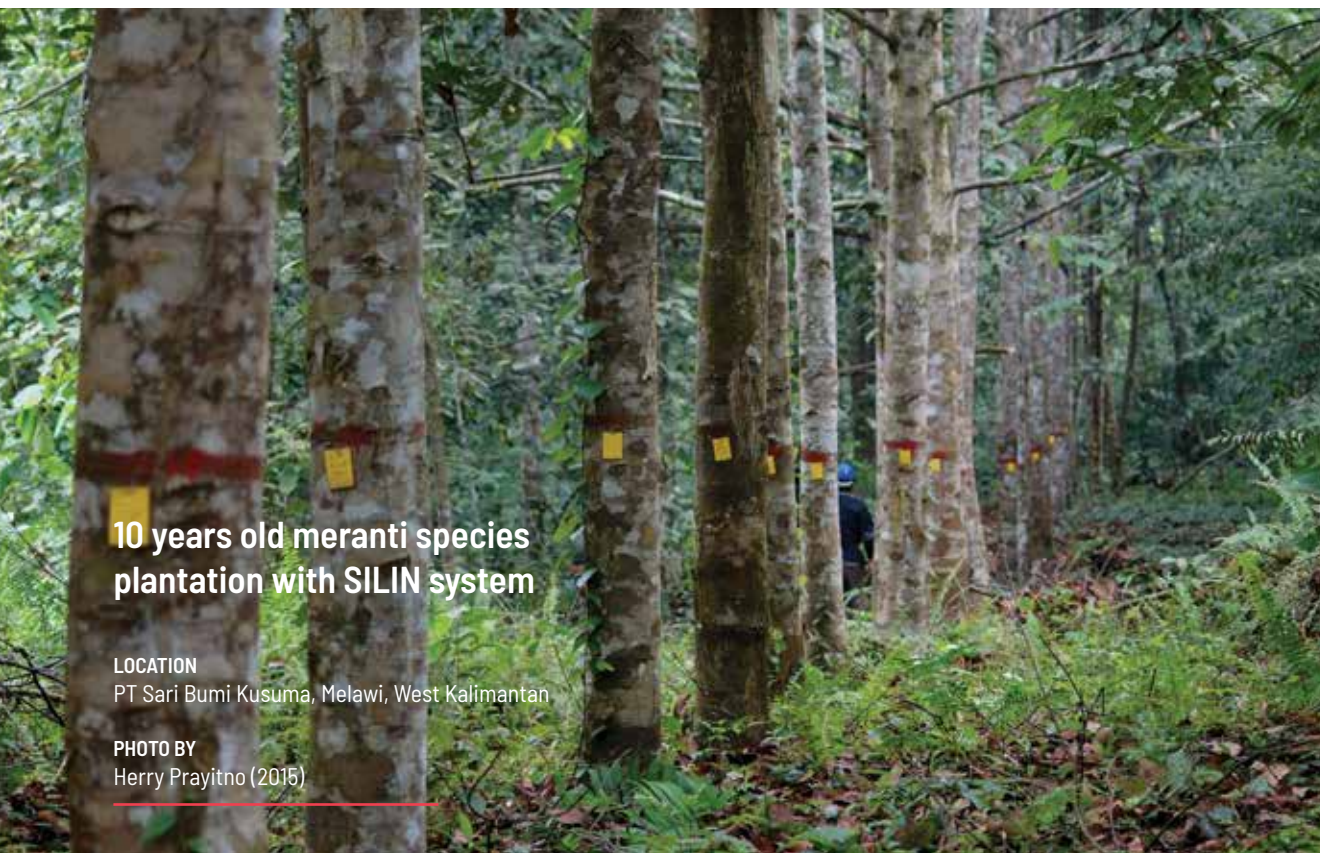
The gap between targeted and actual log production is due to several problems in the field. Low log production with high production costs has lowered the profits of many natural forest concessions. This diminishing profitability is part of the reason that 28.8 percent of natural forest concession holders have no activities in the field. The government is evaluating the performance of natural forest timber concessions and encouraging their commitment in managing the Production Forest sustainably.

Low productivity of natural forests has affected the performance of forest concession holders. Rehabilitation activities need to be encouraged to address this issue so that natural forest can continue to maintain life support systems. Intensive Silviculture (*Silvikultur Intensif*/SILIN) techniques are one of the ways to rehabilitate forests and improve natural forest productivity in concession areas. It is still hoped that someday this technique may produce 200 m³ per hectare of high value natural forest timber species, a significantly improvement to average natural forest yields of only 30 m³ per hectare. SILIN with meranti as the main tree species has



SOURCE: KLHK, Data as of May 2020

► FIGURE 6.2 Target and realization of log production from IUPHHK-HA and IUPHHK-HTI



10 years old meranti species plantation with SILIN system

LOCATION
PT Sari Bumi Kusuma, Melawi, West Kalimantan

PHOTO BY
Herry Prayitno (2015)

in some places been shown to improve the productivity of natural secondary forest 2-3 times above current practices.

Meanwhile, 27 percent of Industrial Plantation Forests (HTI) in Indonesia have no management activity in the field. This is because of social conflicts, weak financial performance, and the gap between HTI and downstream industries. Social conflicts experienced by HTI are often with communities who are living inside or at the edges of the plantations. These conflicts are usually about communities who wish to utilize forest resources inside the HTI. In order to resolve this problem, the government has instructed concession holders to:

(1) Conduct conflict mapping in the HTI and develop appropriate conflict resolution plans.

(2) Initiate multiple streams of business, focusing not only on timber management

(3) To the extent that HTI have the standing and capacity to do so, and to the extent that doing so would help to mitigate conflict, try to help facilitate access for affected communities to Social Forestry schemes, including Forestry Partnerships, Community Plantation Forests, Community Forests, Village Forests and *Adat* Forests.

In 2019, a new Ministerial Regulation No. 62/2019 concerning HTI Development was issued. This regulation opens up opportunities for HTI concession holders to optimize their concession areas not only for conventional timber plantations, but also to develop NTFP through agroforestry systems, construction of NTFP processing industries, and the

strengthening of Social Forestry through the Forestry Partnership scheme.

Forestry Partnership schemes have been sought as a conflict resolution approach that can reduce the number and intensity of conflicts between forest concession holders and communities. Through this Social Forestry scheme, forest concession holders serving as off-takers from embedded smallholders¹⁰² is expected to be developed.

By the end of 2019, 251 Memorandums of Understanding (MoU) for Forestry Partnerships between HTI and communities had been signed, involving 26,006 people in

nine provinces (see Table 6.2).

Production forest management is now more sustainable, more productive in some areas, and more inclusive of communities. An important emerging strategy is a multi-business approach which combines wood-based forest products and non-timber forest products (NTFP). Community involvement has increased timber production and community welfare through the implementation of community forest plantations (HTR) and NTFP.

The change in paradigm was based on: a new set of business configurations for the management of Production Forest resources, with a more diverse set of forest-based business including food, renewable energy, ecotourism, agroforestry, non-timber forest products, and environmental services; an increase in the proportion of resources

¹⁰² Smallholder system here is defined as provision of some parts of the concession areas to be managed and used by communities for business that are mainly related with the main business of the concession but can also other business that concession holders may act as their off-taker.

► **TABLE 6.2** Forestry Partnership MoUs between communities and IUPHHK-HT, as of December 2019

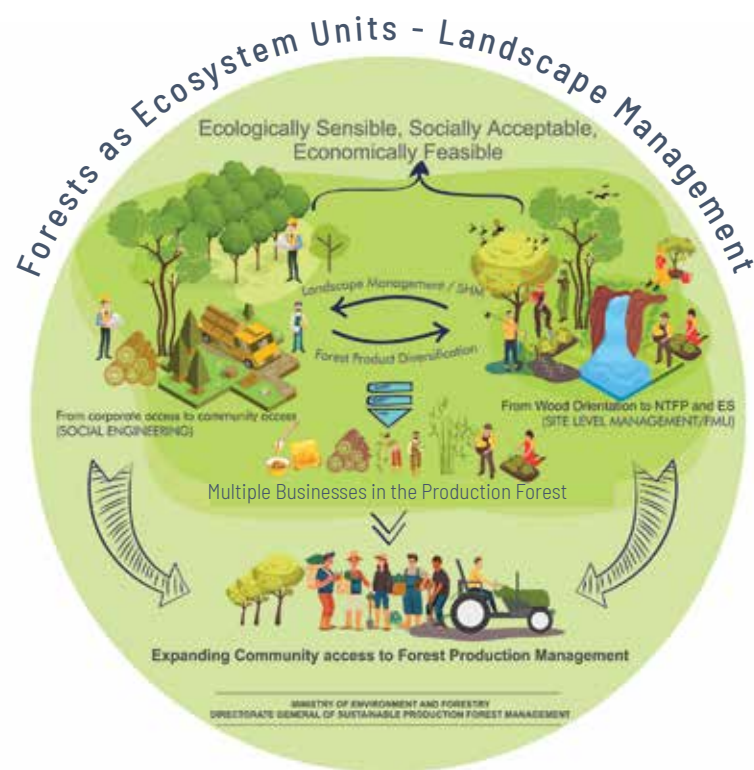
No	Province	No. of MoU	Area size in the MoU (ha)	No. of community members (people)
1	North Sumatera	7	2,722	5
2	Riau	40	24,592	2,927
3	Jambi	32	20,067.35	8,468
4	South Sumatera	100	107,327.30	8,918
5	Lampung	7	669.75	1,293
6	South Kalimantan	31	13,806.34	3,524
7	East Kalimantan	27	1,988.21	697
8	Gorontalo	2	320.44	70
9	Nusa Tenggara Barat	5	52	104
Total		251	171,545.39	26,006

SOURCE: KLHK, Data as of December 2019.

made available to communities; conflict resolution; and increased effectiveness of forest management (Figure 6.3). This new business configuration has now been adopted and become the basis for the “2019-2045 Production Forest Development Roadmap” to be followed by the Association of Indonesian Forest Concessionaires (APHI, 2019). A number of regulations have also been promulgated to grant local communities with legal access to forest resources and to engage them in the management of Production Forests, as well as a new set of regulations for enabling multiple business in Production Forest policy.

With a focus on the development of local community-based businesses in Production Forest areas and with the implementation

of strategies to promote the emergence of a wide range of multi-commodity and multi-stakeholder businesses, it is expected that more effective KPH management will be achieved with greater benefits for community members. Consideration is also being given to the concept of one site, one sustainable product. The critical determinant for the success of these new business configurations is the development of synergies and linkages between all stakeholders involved in forest management, including the community, the private sector, and government agencies, with the Government providing support for the private sector and empowering the community, and with the private sector and the community engaging together as equal partners.



► **FIGURE 6.3** Promoting ecosystem services through a multi-business approach for effective landscape-based forest management

► **TABLE 6.3** Contribution of Production Forest to national economy in 2015 - 2020

CONTRIBUTION ITEM	2015	2016	2017	2018	2019	2020
Non-Tax State Revenue	USD 266 million	USD 198 million	USD 209 million	USD 223 million	USD 208 million	USD 56 million
Forest Product Exports	USD 9.88 billion	USD 9.32 billion	USD 11.01 billion	USD 12.13 billion	USD 11.62 billion	USD 4.46 billion
Logs from Natural Forests (IUPHHK-HA)	5.6 million m ³	5.4 million m ³	5.4 million m ³	7.02 million m ³	6.19 million m ³	1.61 million m ³
Logs from Industrial Timber Plantations (IUPH-HK-HT)	33.23 million m ³	32.19 million m ³	37.79 million m ³	40.94 million m ³	39.45 million m ³	18.44 million m ³
Processed Timber	39.13 million m ³	39.46 million m ³	45.82 million m ³	47.70 million m ³	48.35 million m ³	16.82 million m ³
NTFP Products	251,088 ton	443,837 ton	316,955 ton	358,789 ton	474,198 ton	69,628 ton

SOURCE: KLHK, Data as of May 2020

6.2 The Contribution of Forest Resources to National Revenue

6.2.1. Contribution of Timber and Non-Timber Forest Products

In terms of their economic function, forests are a source of materials used to produce goods and services of economic value. They are also sources of state revenue, employment, and support community livelihoods. However, forests cannot be viewed only in terms of the direct economic benefits they provide. They must also be seen in terms of their environmental and social functions.

In 2015, the total value of the non-tax state revenues (fees and royalties) derived from the forestry sector amounted to USD 266 million (see Table 6.3). From 2015 to 2020, production of timber and NTFP directly employed about 400,000 people in any given year. What appears to be a decline in 2020 is actually a reflection of the fact that, for purposes of this figure, data for this year was recorded only up to the month of May.

Production forests can be utilized following the issuance of permits

based on the type of utilization. Data for the period from 2013 to 2019 shows that there have been significant fluctuations in the level of the production of logs, with flat or sustained increases in the production of all categories of processed timber, in the form of sawn timber, plywood & laminated veneer lumber, veneer, wood chips and wood pulp (see Figure 6.4). What appears to be a decline in 2020 is actually a reflection of the fact that, for purposes of this figure, data for this year was recorded only up to the month of May.

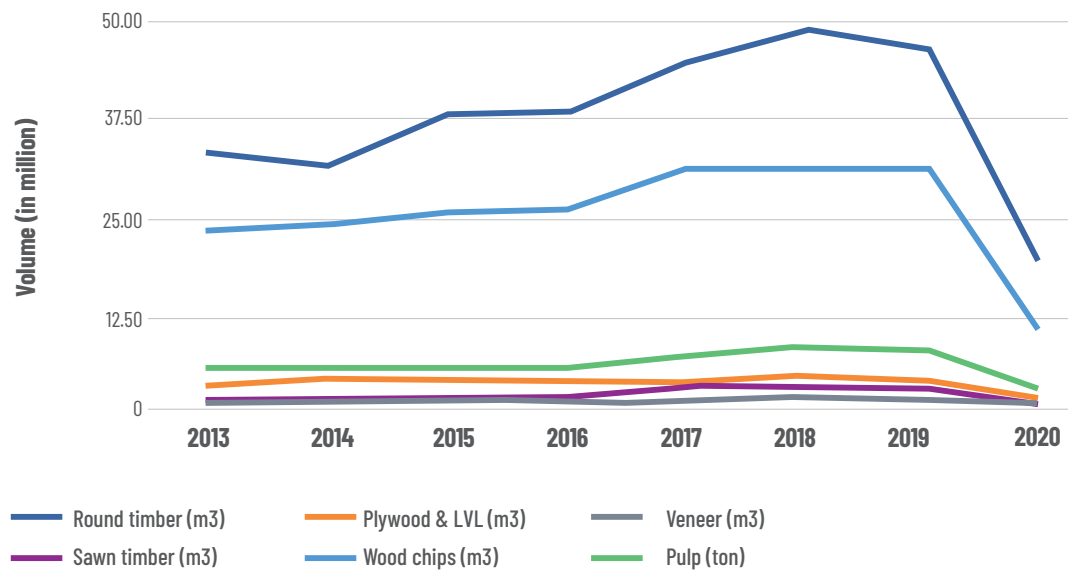
During the same years, the level of production for non-timber forest commodities varied to the point where, during some years, data is not available for some of these commodities (see Figure 6.5). Included in the “bean, seed, and grain” group are products from agroforestry, such as rice, corn, coffee, cacao, candlenut, illipe nut, cardamom, etc. The “Leaf & Root” group includes cajuputi leaf, eucalyptus leaf, and clove leaf. The “Gum” group includes pine, rubber, swamp rubber (*jelutong*), *ketiau*, and *sundik*. While the “Resin” group consists of various resins from Dipterocarp trees (*damar batu*, *damar*

mata kucing), Agathis trees (*damar kopal*), agarwood (*gaharu buaya*, *kemendangan*, etc.). The category of "Others" includes honey, palm sugar, sago, palm flower juice, palm fiber, etc. In addition, since 2018, monitoring of NTFP production from silvopastoral and silvofishery activities was started. In 2018, silvofisheries products include fish, shrimp, and crab and the amount recorded from initial monitoring was 221.66 tons. For silvopastures, the products are beef, goat, chicken eggs, and chicken meat, and the amount recorded from initial monitoring was 52.61 tons. NTFP production may take place under a Business License for Utilizing NTFP (*Izin Usaha Pemanfaatan Hasil Hutan Bukan Kayu*, IUPHHBK) as well as under any one of several normal forest management business licenses.

Since 2019, by the issuance of a new Ministerial Regulation on the utilization of NTFP in Production Forests and other parts of the Forest Area, forest concession holders can now utilize NTFP without

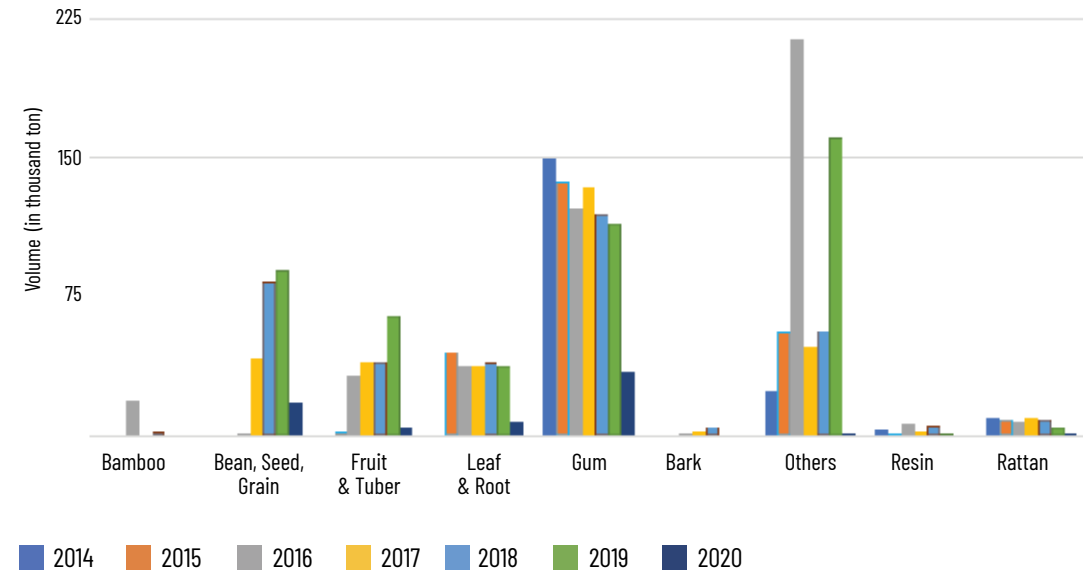
applying for IUPHHBK permit, as long as they include NTFP utilization in their annual business plan (*Rencana Kerja Usaha*, RKU for HA, HT, and RE concession holders or *Rencana Pengelolaan Kawasan Hutan*, RPKH for Perhutani's FMU). In addition to obtaining business license (permit), NTFP collection and utilization can be done through cooperation with Forest Management Unit/FMU. FMUs are expected to cooperate with investors, such as State Corporate Companies, private companies, cooperatives, etc. Types of NTFP include harvestable products like pine resin, rattan, etc., but also include the utilization of environmental services, such as nature tourism, water, etc. Box 6.1 briefly describes the Kick-Off Event for the Development of Community-Based NTFP and Environmental Services Multi-Businesses.

A significant, sustained increase has been recorded in the annual export of processed timber products (see Figure 6.6).



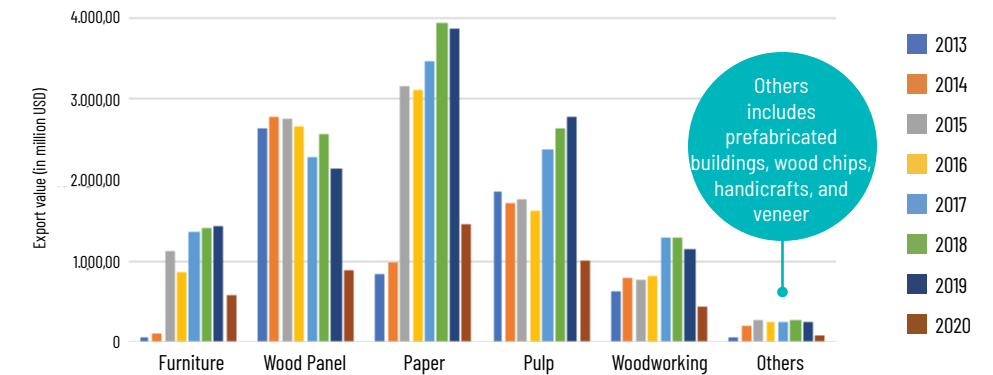
SOURCE: KLHK, Data as of May 2020.

► FIGURE 6.4 Production of Indonesian timber and timber products in 2013 - 2020



SOURCE: KLHK, Data as of May 2020

► FIGURE 6.5 Indonesia's non-timber forest product production in 2014 - 2020



SOURCE: KLHK, Data as of May 2020

► FIGURE 6.6 Export of processed timber products in 2013 - 2020

BOX 6.1

Development of Community-Based Non-Timber Forest Products and Environmental Services Multi-Businesses: A Kick-Off Event

The Kick-Off Event for the Development of Community-Based NTFP and Environmental Services Multi-Businesses: Toward an Industrial Revolution 4.0 was held on Friday, 10 May 2019 in Jakarta by the MoEF's DJPHPL. This event drew 424 people from inside the MoEF, as well as stakeholders from other line ministries, experts, universities, governors, provincial forestry officers from throughout Indonesia, FMUs, associations, NGOs, and community groups. The Minister of Environment and Forestry, Dr. Siti Nurbaya, opened the event and said that she expected that the occasion would be utilized by stakeholders as arena for discussions as well as business meetings. The event was also a mean for Government and Stakeholders to develop Community-Based NTFP and Environmental Services Multi-Businesses:

- a. Develop an understanding of and commitment to developing community-based NTFP and environmental services multi-businesses.
- b. Achieve industrialization and product downstream development for NTFP and environmental services.
- c. To enable online markets for NTFP and environmental services.

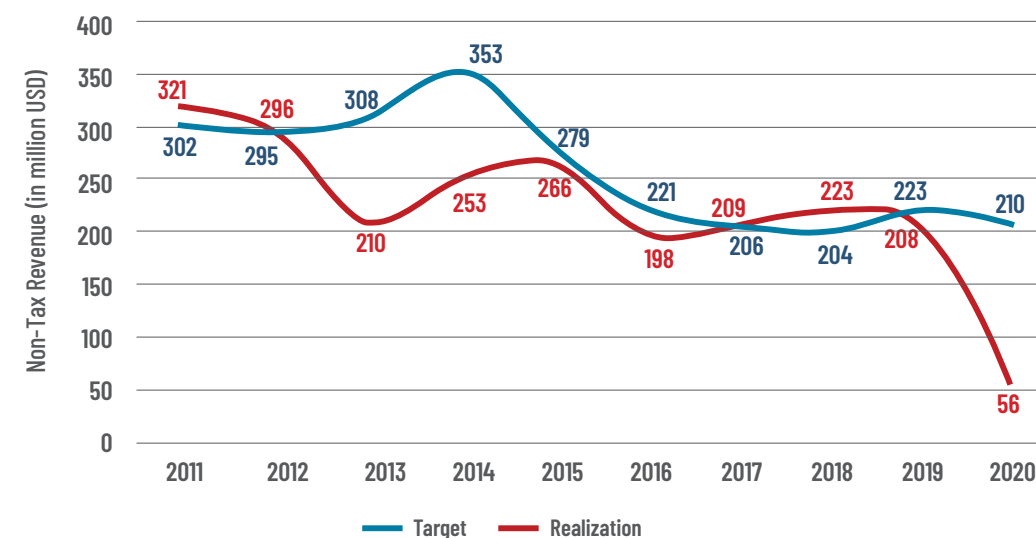
It is estimated that 95 percent of NTFP and environmental services values are not yet optimized. Growth in these sectors is closely related with community livelihoods and economies, both within and surrounding the forests. Therefore, in her opening remarks, the Minister encouraged stakeholders to have a strong commitment and holistic approach in exploring and developing Community-Based NTFP and Environmental Services Multi-Businesses, in line with the progress of an Industrial Revolution 4.0.

6.2.2. Non-Tax State Revenue from Timber, NTFP, and Forest Area Utilization

Non-Tax State Revenue (PNBP) refers to all revenues conveyed to the nation which are not sourced from taxes. From 2011 to 2019, sources of PNBP from the forestry sector included payments into the Reforestation Fund (DR), the Forest Resource Royalty (PSDH), the Forest Product Utilization Business License Fee (*Iuran* IUPHH), the Environmental Services Utilization Business License Fee (*Iuran* IUPJL), Forest Exploitation Violation Fines and Stumpage Compensation (GNRT), a requirement that trees felled illegally by timber concessionaires will levied with royalties ten times higher than normal regulated levels. The total amount of PNBP from forestry sector for the period of 2011

to 2019 was USD 2.18 billion, lower than a target of USD 2.4 billion (see Figure 6.7).

In order to increase PNBP, the government has taken the following steps: regulatory intervention (regulation development involving multiple parties, and based on the principal that regulations must be simple, implementable and measurable), building synergies between the central and local governments, strengthening the collection of PNBP receivables (through SIPNBP, the Non-Tax State Revenue System, *Sistem Informasi Penerimaan Negara Bukan Pajak*, a computerized system for PNBP collection), and optimizing PNBP from non-timber forest products. Figure 6.7 shows the target and realization of PNBP from DR, PSDH, *Iuran* IUPHH, *Iuran* IUPJL, Forest Exploitation Violation Fines and Stumpage



SOURCE: KLHK, Data as of May 2020

► FIGURE 6.7 Targeted and realized Non-Tax State Revenues from forestry in 2011 - 2020

Compensation from 2011 to May 2020. It is important to note that data for 2020 covers only to the month of May 2020.

6.2.3 Contribution of Conservation Areas to National Revenue

Tourists visiting conservation areas will contribute to Non-Tax State Revenue (PNBP), which is obtained from admission tickets for person and vehicles, tourism activities, guest houses, commercial film snapshots and research activities within the conservation area. For the period of 2015 to 2019, the targeted number of tourist visits to conservation areas was 1.5 million foreign tourists and 20 million domestic tourists. The actual number

of foreign tourist visits to conservation areas during 2015-2019 was 2,059,343, exceeding the target by 37.29 percent. The actual number of domestic tourist visits was 31,873,624, exceeding the target by 59.37 percent.

In order to increase the tourist's visitation number to conservation areas, the Ministry of Environment and Forestry opens opportunities for the private sectors and local communities to develop ecotourism business in conservation areas. There are two types of ecotourism business in conservation areas which consist: 1) Ecotourism Private-Partnership with Facilities (IUPSWA), and 2) Ecotourism service Private-Partnership (IUPJWA). The IUPSWA permit can only be requested by corporations. On the other hand, the IUPJWA can only be requested

by people from local communities surrounding conservation areas. The operation of ecotourism business has generated PNBP.

To get licenses, applicants for IUPSWA and IUPJWA should register and submit required documents through an Online Single Submission (OSS). There are 52 corporations holding IUPSWA licenses, with another 42 in the process of fulfilling requirements to get their licenses from OSS, and 7 corporates in the registration stage. Additionally, 109 IUPJWA permits

have been granted, with 2 more applicants in the registration stage. IUPSWA are spread throughout 18 national parks and 31 nature tourism parks. Meanwhile, the IUPJWA are obtained by communities in 11 national parks, 9 nature tourism parks, and 1 wildlife reserve. In 2019, PNBP derived from licenses and business royalties for IUPSWA reached USD 515,692. In addition to Non-Tax State Revenue (PNBP) generated from conservation areas, there are also multiplied economic values from associated tourism businesses, such as

hotels, transportation, travel agents, tour operators, food and beverage businesses, and the souvenir business.

Besides tourism, conservation areas have ecosystem services whose values is seldom quantified. These ecosystem services include water ecosystem services (water for drinking, household activities and hydropower) and geothermal power. For the period of 2015 to 2019, the targeted number of new licenses for water supply, water energy for hydropower, and geothermal in conservation areas was 25, 50, and five, respectively. In 2019, the target was for five new licenses for water provisioning, 15 new licenses for water energy, and two new licenses for geothermal environmental services. In fact, in 2019 the Ministry Environment and Forestry issued 11 new water provisioning license, one new water energy license, and two new geothermal environmental services licenses. Total Non-Tax State Revenue generated from water provisioning licenses in 2019 was USD 117,613, while water energy licenses brought in USD 1,547.

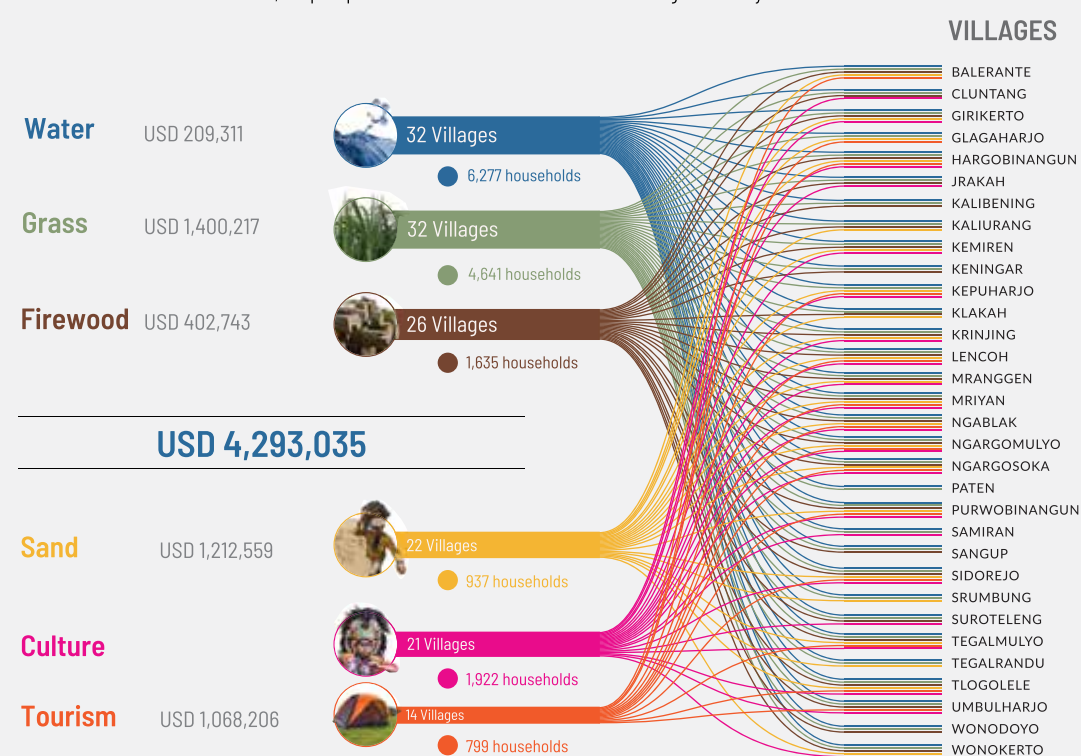
Meanwhile, the regulation to collect PNBP from geothermal business licenses is still in the discussion process in Ministry of Finance. The amount of geothermal environmental service business license fees and royalties has been formulated and included in the revision to Government Regulation Number 12 of 2014 concerning Types and Rates for Non-Tax State Revenues (PNBP) Applicable to the Ministry of Forestry. But the revision is still in the discussion process. Meanwhile, Geothermal Environmental Services License (*Izin Pemanfaatan Jasa Lingkungan Panas Bumi*) were awarded to four corporations since 2016, but no license fees and royalties have been collected yet.

Another potential contribution of conservation area to the national economy is from bioprospecting. Indonesia is

a megadiversity country and many of its biodiversity resources have not been utilized, or are underutilized. Bioprospecting is an attempt at achieving nature-based solutions to mankind's problems, as well as a potential community-based economic mover. Among many bioprospecting activities in the country, some are found in conservation areas. Microbes for anti-frost were found in Gunung Ciremai National Park. *Candidaspongia sp.* was found in Teluk Kupang Marine Recreation Park and has potential as an anti-cancer drug. *Taxus sumatranus*, which has potential uses for anti-cancer chemotherapy, was found in Kerinci Seblat National Park, together with several other plants with potential for medical uses (Wiratno, 2019). Meanwhile, a recent study in Gunung Merapi National Park found that no fewer than 48 understory species have potential to be developed as free radical scavengers. Of the 48 species, six have the potential as antioxidants, namely *Clidemia hirta*, *Melastoma candidum*, *Phyllanthus urinaria*, *Polygonum chinense*, *Emilia sonchifolia*, and *Shuteria vestita*. Phytochemical analysis of these species found that all of them contain saponin, flavonoid, and terpenoid, while alkaloid is found in *Clidemia hirta* and *Melastoma candidum* (Nurwijayanto, 2020).

Economic Values of Gunung Merapi National Park

Gunung Merapi National Park is located in the Special Region of Yogyakarta and Central Java Province, surrounded by 32 villages and 107,488 persons. The 6,100 hectare park area is part of Gunung Merapi, one of the most active volcanoes in the world. As a conservation area, the park provide enormous benefits to the surrounding community



6.3 Forest and Forest Products Certification

6.3.1 Forest Law Enforcement, Governance and Trade Licensing in Indonesia: "From Stigma to Appreciation"

For more than three decades, Indonesia was notorious for being one of the countries in the world with the highest rates of illegal logging. The prevalence of illegal logging in Indonesia and elsewhere led to deforestation and forest degradation and caused considerable losses. Some

environmental activists, especially those from developed countries, began to call for a boycott of wood products from tropical forests, including from Indonesia. This influenced the global trade in timber and wood products and provided motivation to tropical timber producing countries to step up action against illegal logging. Indonesia began to implement law enforcement and more effective policies to combat illegal logging.

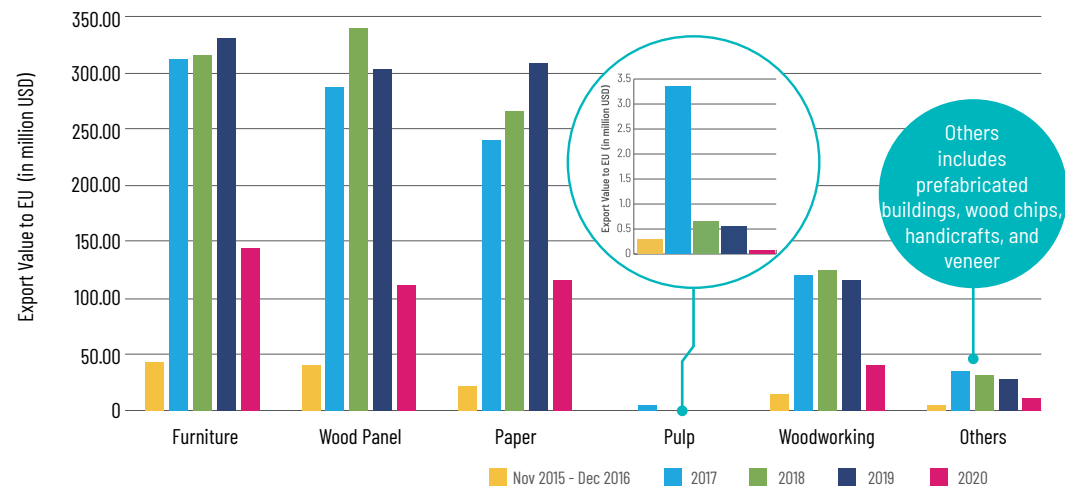
In 2001, Indonesia hosted an East Asia regional ministerial-level meeting to agree on measures to eradicate illegal logging, which produced the Bali Declaration on Forest Law Enforcement and Governance (FLEG). The Declaration was an agreement to eradicate illegal logging through improved governance of the trade of timber and wood products, to ensure the sustainability of forest resources.

One year later, the Ministry of Forestry worked with a range of stakeholders in Indonesia and established a national initiative to guarantee the legality of Indonesia's timber. In the following year, the European Union (EU), one of the world's largest consumers of timber products besides the United States and Japan, implemented a Forest Law Enforcement, Governance and Trade (FLEGT) action

plan to support the eradication of illegal logging through trade arrangements.

After years of highly-focused multi-stakeholder discussions and negotiations, in 2009, the Indonesian Timber Legality Assurance System (*Sistem Verifikasi Legalitas Kayu*, SVLK) was established to ensure the legality of timber sourced from within Indonesia. The use of this system is mandatory for all enterprises utilizing timber forest products at all stages of production, from upstream to downstream. With the implementation of the SVLK, Indonesian timber and timber products that are destined for export, which are derived from forests of all different statuses, both private and state forests, are legally guaranteed and certified as sustainably managed products. The SVLK has been recognized as an effective instrument to verify the legality of timber by a number of consumer countries that require guarantees regarding the legality of timber, including those from the EU. The credibility of the SVLK has been recognized through the FLEGT VPA Indonesia-EU Agreement, signed on 30 September 2013, ratified by Indonesia in 2014, and coming into force on 15 November 2016.

FLEGT licenses represent a significant achievement by Indonesia in terms of



SOURCE: KLHK, Data as of May 2020

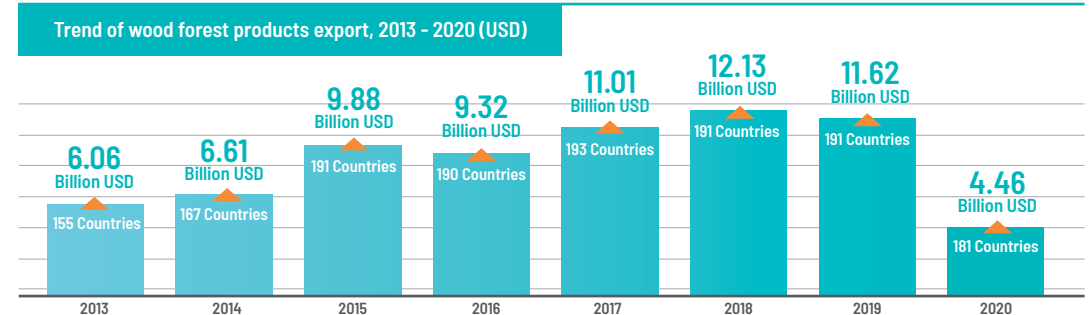
► FIGURE 6.8 Value of Indonesian processed timber exports to the European Union in 2016 - 2020

combating illegal logging and ensuring the sustainability of forest resources. Indonesia is the first of 15 producer countries to be entitled by the EU to unilaterally issue FLEGT Licenses. Because they are accompanied by FLEGT licenses, wood products from Indonesia are said by the EU to no longer require being subjected to additional due diligence procedures.

This will increase the competitiveness of Indonesian timber products, as it is expected that importers from the EU will increasingly show a preference for FLEGT-licensed products from Indonesia. According to data from <https://silk.menlhk.go.id/>, in the period from 15 November

2016 to 31 December 2019, 123,025 FLEGT licensed and document V-Legal shipments were received by importers in 28 countries in the European Union, with a total associated export value of USD 3.29 billion (See Figure 6.8). Meanwhile, from January to May 2020 the export value to EU reached USD 425.87 million (see Figure 6.9).

In addition to the high level of recognition SVLK has received from the EU, in 2014 Australia also acknowledged that SVLK-licensed exports fulfill the requirements mandated by Australia's Illegal Logging Prohibition Act. With this level of recognition, Indonesian timber products can also be exported to Australia



SOURCE: KLHK, Data as of May 2020

► FIGURE 6.9 Exports to various continents in 2013 - 2020

without further due diligence procedures. It is expected that other countries that apply regulations related to the legality and sustainability of imported wood products, such as the United States with the 'Lacey Act' and Japan with 'Clean Wood Act,' will also recognize the effectiveness of the SVLK system. Figure 6.9 also shows trend of timber export from Indonesia to various continents with 2019 performance declining only slightly from 2018. Figure 6.10 also shows the top-five importer countries of processed timber products from Indonesia are China, Japan, USA, the European Union, and South Korea.

6.3.2 Certification of Sustainable Forest Management and Timber Legality

The establishment of the SVLK was guided by three main principles - good governance, representativeness, and credibility. In the implementation of the system, the Government serves as the regulator, with a range of stakeholders involved in assessment and verification procedures, including the National Accreditation Committee (KAN), business enterprises and their representative organizations, and independent

monitors, including non-governmental organizations and academic institutions.

SVLK provides two forms of certification, namely Sustainable Production Forest Management Certification (PHPL) and Certification of Timber Legality (SLK). In the case of PHPL, natural forest timber concession holders (IUPHHK-HA) have made significant advances in achieving certification of sustainable production forest management. However, the performance of these concession holders in terms of their management of production forests must still be monitored and evaluated on an ongoing basis in order to facilitate the preservation of production forest resources. In the case of the SLK, the focus is on the downstream sector (timber industries, registered log yards near timber mills known as TPT-KB, handicraft & home industries, and exporters), in terms of the legality of these business units, and of the timber they source as raw material for production, processing and marketing. The upstream sector is also obliged to follow the SLK, not only IUPHHK-HA and IUPHHK-HT, but also community-based forests, private forests, and permits for the clear felling of forests to prepare room for industrial timber and oil palm plantations, known as Timber Utilization Permits (IPK). SLK certificates

are valid for specific defined periods, with recertification required.

The implementation of SVLK has implications for improving forest governance in Indonesia, including in terms of improving the level of transparency and availability of public information, the deregulation of licensing in the regions, applying enhanced management practices and achieving improved compliance. All of these may improve Indonesia's standing as a timber producer within the global community.

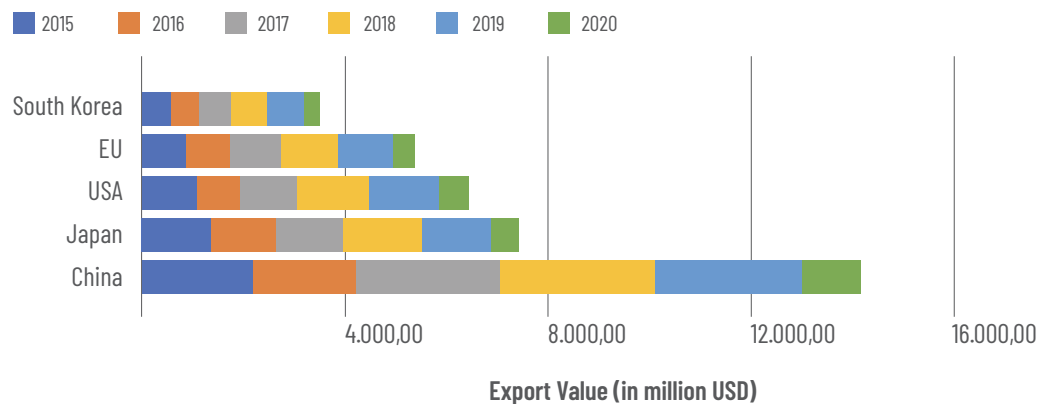
As of December 2019, the number of management units (MU) or business enterprises that had obtained PHPL certificates or SLK certificates is shown in Figure 6.11.

Micro, Small and Medium Enterprises (MSMEs) have also been required to participate in the SVLK since 2013. To enable their participation, MSMEs

have been provided with facilitation by donor agencies, NGOs, and community associations (see Table 6.4). This facilitation involves not only the provision of financing for certification, but also institutional capacity building.

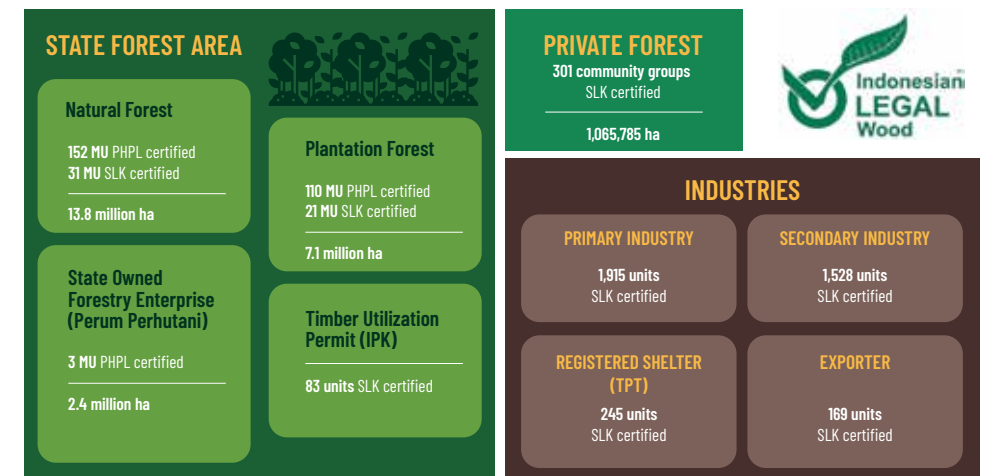
Local governments play an important role in promoting the acceleration of the implementation of the SVLK. A number of districts have issued district-level regulations related to the implementation of the system, including Jepara, Jombang, Klaten and Buleleng.

The effectiveness of the system has also been recognized by the international community, as evidenced by interest of a number of countries in studying or conducting comparative studies of the system, including China, Laos, Myanmar, Malaysia, Thailand, Cambodia, Vietnam, Ghana and Japan.



SOURCE: KLHK, Data as of May 2020

► FIGURE 6.10 Top-five importer countries of processed timber products from Indonesia in 2015 - 2020



MU = Management Unit • PHPL = Pengelolaan Hutan Produksi Lestari • SLK = Sertifikasi Legalitas Kayu
IPK = Izin Pemanfaatan Kayu • TPT = Tempat Penampungan Terdaftar

SOURCE: KLHK, Data as of December 2019

► FIGURE 6.11 Progress of PHPL and SLK certification as of December 2019

▶ TABLE 6.4 Facilitation provided to MSMEs to implement SVLK

Activity	2015	2016	2017	2018	2019	2020
Certification	21 Private Forests and 18 MSME	13 MSME	2 MSME	120 MSME	353 MSME	0
Surveillance	22 Private Forests and 1 MSME	2 MSME	13 MSME	32 MSME	53 MSME	9 MSME

SOURCE: KLHK, Data as of May 2020.

6.4. Shifting Orientation from Timber to Forest Management

In order to increase the economic value of production forests, to improve justice of access, overcome disparities, improve forest governance and resolve tenurial conflicts, a paradigm shift is underway. This is a shift in orientation from timber management to integrated forest management. This transformation has resulted in a more holistic management of forest landscapes, and a higher level of harmony and balance between the three functions of Production Forests (economic, social and ecological).

The most significant change according to this new paradigm is the repositioning of the role of communities in the management of production forests. Instead of serving only as sources of labor, community members become active entrepreneurs who establish privately owned enterprises, village-owned enterprises or cooperatives, and small and medium enterprises. All parties now have equal access and opportunities to conduct businesses using resources derived from Production Forests, and to form new forestry business configurations. Forest Management Units (FMU) play a critical role in facilitating this new paradigm. As such, a target was set to establish 347 production forest management units (KPHP) by 2019 to cover all Production Forest areas. This target was met by December 2019. Of the 347 KPHP established, 161 are progressing with development of their Long-Term Management Plans (*Rencana Pengelolaan*

Hutan Jangka Panjang, RPHJP), which include social forestry programs. The paradigm is shifting from access to licenses for forestry corporations to one that also expands community access. Local communities may be involved in Production Forest management through non-license forest utilization schemes by partnering with FMU. Banawa Lalundu Production Forest Management Unit in Central Sulawesi is one among many FMUs that have involved forest farmers groups in the management. Box 6.2 is a brief description of community involvement in FMU activities.

Another change relates to the increased efforts to maintain the ecological functions of production forests and thereby to help facilitate the achievement Indonesia's Nationally Determined Contribution (NDC) goals and targets, both mitigation and adaptation. With respect to mitigation, these targets mandate a minimum 29 percent reduction of emissions by 2030, with the forestry sector responsible for 17.2 percent of that amount. As for adaptation, the mandate is to strengthen climate resilience, including economic resilience, social and livelihood resilience, and ecosystem and landscape resilience. Both mitigation and adaptation will be aided by the implementation of sustainable forest management practices and systems to reduce deforestation and forest degradation.

Regulations have been promulgated to reduce the impact of logging in terms of the volume of carbon emissions (Reduced Impact Logging-Carbon, RIL-C). These regulations now apply voluntarily to all production forest

BOX 6.2

Banawa Lalundu Production Forest Management Unit, Central Sulawesi

Banawa Lalundu Production Forest Management Unit (KPHP Banawa Lalundu) covers parts of the areas of Donggala District and Palu City, Central Sulawesi. The extent of KPHP Banawa Lalundu is 110,079 hectares. KPHP Banawa Lalundu is divided into a Production Forest area of 69,994 hectares comprising both Limited Production Forest (*Hutan Produksi Terbatas*, HPT) and permanent Production Forest (*Hutan Produksi*, HP), and a Protection Forest (*Hutan Lindung*, HL) area of 40,085 hectares. The KPHP has 4 sub-units (resorts): Resort Pinembeni Ulijadi, Resort Banawa, Resort Lembasada, and Resort Lalundu.

Timber potential identified in KPHP Banawa Lalundu includes ebony (*Diospyros celebica*), *palapi* (*Heritiera* sp.), *nyatoh* (*Palaquium* sp.), *cempaka* (*Elmerillia* sp), agathis (*Agathis* sp), *meranti* (*Shorea* sp.) and *jabon* (*Antocephalus macrophylla*). However, KPHP Banawa Lalundu has been focusing on non-timber forest product and nature tourism business. Among non-timber forest product identified are rattan (*Calamus* spp.), bamboo (*Bambusa* sp.), damar resin, palm sugar (*Arenga pinnata*), and kelorina seed oil (*Moringa oleiferp*, *minyak kelor*). Involving forest farmer groups from surrounding the area, KPHP Banawa Lalundu has been producing kelorina seed oil, coffee, and kelorina tea from kelor leaf. In addition, agroforestry products, such as *bawang Dayak* (*Eleutherine palmifolia*) are also being produced. Handicraft products are also being made from the roots, stems, and leaves of bamboo and rattan.

There are several nature tourism opportunities in KPHP Banawa Lalundu, such as the Kabonga (*Kawasan Ekowisata Mangrove Kabonga*) and the Salusumpu (*Kawasan Ekowisata Mangrove Salusumpu*) mangrove areas and the waterfalls of Loti and Pangansintoli. The mangrove ecotourism areas have been developed for ecotourism activities and equipped with wood and bamboo jungle track facilities. Likewise, waterfalls are now equipped with public facilities for visitors. Higher elevation areas in KPHP Banawa Lalundu have also been developed for paragliding. Salena Paragliding Tourism has attracted international visitors. From 25 to 28 September 2018, an international paragliding championship was held in Salena as part of the Palu Namoni III Pesona Festival. The Salena area also has potential for the development of mountain bike tracks, ziplines, and a tourism village to share the area's local cultural heritage.

concession holders. RIL-C is an intensive logging practice that involves the use of low impact techniques and equipment, with close monitoring to ensure the minimal possible damage to soil and remaining forest stands, and thus a minimal release of carbon. The implementation of RIL-C is expected to reduce emissions by up to 40 percent from the Business as Usual baseline for normal selective logging practices. As of 2020, 26 IUPHHK concession holders in natural forests have implemented RIL-C. In addition to reducing carbon emissions, RIL-C also has the potential to reduce production costs and increase productivity.

The last change relates to improving the competitiveness of Indonesia's forest products and exports through bureaucratic reforms and through ongoing development of certification and information systems. To ensure that Indonesia's exports remain regionally and globally competitive, processes related to obtaining production forest business licenses must be made simpler and faster. A number of systems to support production forest management have been developed by the Ministry of Environment and Forestry and are currently operational, include:

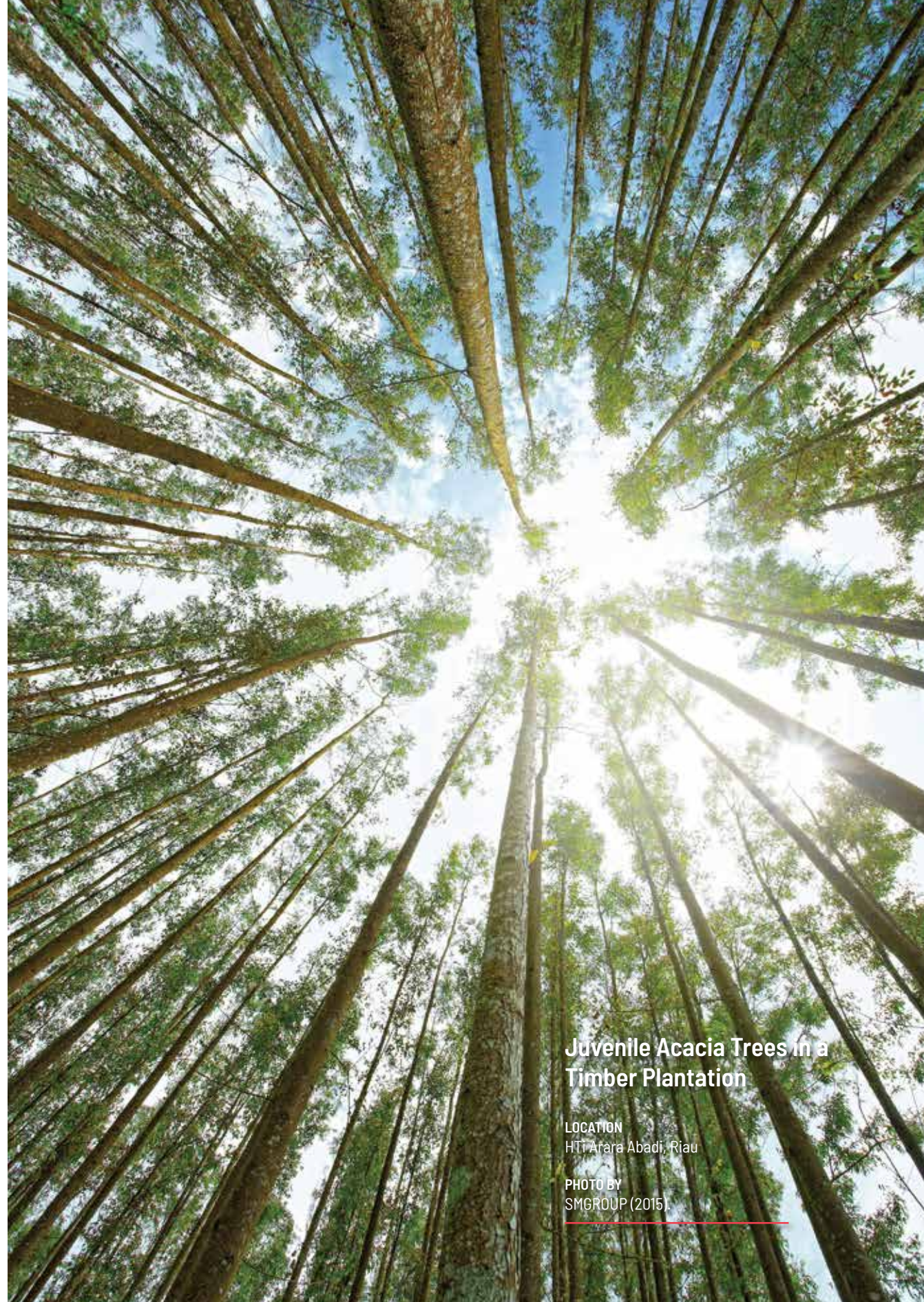
- 1) PHPL Data Release (<http://phpl.menlhk.go.id>) is an integrated information service

application for the management of sustainable production forests and release of public information to ensure citizens' access information.

- 2) SEHATI or the IUPHHK-HTI Performance Report Monitoring System (<http://sehati.menlhk.go.id>) is a web-based IUPHHK-HTI performance reporting application, to support periodic submission of performance reports for IUPHHK-HTI holders.
- 3) E-MONEV is a system for the Electronic Monitoring and Evaluation of IUPHHK-HA (<http://monevkinerjapha.menlhk.go.id>) which monitors IUPHHK-HA performance.
- 4) SIHHBK or the Non-Timber Forest Product Information System (<http://sihhbk.menlhk.net:777/siphhbkb/home>) is an information service application to improve the quality of NTFP data that makes it easier for governments and communities to access the NTFP information.
- 5) E-Restore or the IUPHHK-Ecosystem Restoration Information System (<http://sekejap.menlhk.go.id>) is a performance report application for IUPHHK-Ecosystem Restoration evaluating activities.
- 6) SIPNBP or the Non-Tax State Revenue System (<http://sipnbp.menlhk.go.id>) is an application used for tracking non-tax State Revenue (PNBP) payments for all timber and non-timber forest products.
- 7) SIPUHH or the Forest Product Administration System (<http://sipuhh.menlhk.go.id>) is an application for the administration of wood products.
- 8) SIRPBBI Online or the Information System for the Fulfillment of Industrial Raw Materials (<http://rpbbi.menlhk.go.id>) is an application for controlling the raw materials consumed by and the production of secondary products by timber mills.
- 9) SILK or the Timber Legality Information System (<http://silk.menlhk.go.id>) is an application to provide data and information related to timber legality verification, especially for export purposes.

SIPUHH is intended to reduce bureaucratic costs for the forestry business sector, and to make companies more efficient, well-structured, and compliant with the rules. In past decades, forest products administration was implemented manually, with supervision performed by officials located on the ground in or near forest sites. However, this mechanism was constrained by limited number of government officers. High unofficial costs burdened businesses, and also led to inaccurate information. In January 2016, SIPUHH was introduced. It is web-based. The system has significantly reduced bureaucratic procedures and requires fewer government officers. Furthermore, the process is quick, and the information is accurate. SIPUHH now serves as the primary means for the provision of public services in the administration of forest products. The system operates 24-hours a day and has provided services to more than 3,000 business actors who produce timber, manage distribution hubs, and manufacture primary forest products.

SIPUHH is a significant innovation in terms of the provision of public services, providing a range of benefits for both business actors and the institutions involved in the provision of the services. With the issuance of Minister of Administrative and Bureaucracy Reform Decree No. 20, 2017, SIPUHH was recognized as one of Indonesia's top 99 public service innovations in 2017, with more than 3,054 competing contestants vying for this award. SIPUHH was also awarded named as a Top 40 Public Service Innovation for 2017, based on Decree No. 40, 2017. SIPUHH can be access at <http://sipuhh.menlhk.go.id>.



Juvenile Acacia Trees in a Timber Plantation

LOCATION
HTI Arara Abadi, Riau

PHOTO BY
SMGROUP (2015)

CHAPTER 7

Concluding Notes and the Way Forward

Consistent policies and a series of corrective measures implemented by the Ministry of Environment and Forestry and highlighted in this book have contributed to a significant improvement in the overall situation of the nation's forests and to people's well-being.

These interventions have contributed to some fundamental changes to the policies at the national level which also affect the global trade. Many important measures had been carried out in cooperation with other line ministries, local governments, as well as in collaboration with various international development partners, all related to challenges in promoting sustainable forest management.

The period of 2015 to 2020 has been a period of some fundamental changes, during which deforestation and forest fires have been significantly reduced, and extensive forest rehabilitation, including peatlands restoration, have been intensified through a new collaborative approach synergizing the government, private sector and communities. These changes have resulted in a significant reduction in CO₂ emissions, leading to commitments by the Green Climate Fund (GCF) and the Norwegian Government to make Result-Based Payments (RBP) to Indonesia in the near future.

Such fundamental changes involved a series of consistent corrective measures and are reflected in continuous improvements in: (a) the quality of forest cover and ecosystems, pollution control, watershed management, biodiversity, and the addressing of climate change; (b) the ability of forests to support

human life, to produce goods and services, and to conserve biodiversity; and (c) the balance of the ecosystem and natural resources within Indonesia's landscapes.

As such, the Government aims to continue upholding its commitments to: (1) reduce the rate of deforestation; (2) control forest and land fires; (3) progress in REDD+ and NDC implementation; (4) enhance conservation of natural forests, scenic beauty and biodiversity; (5) provide more forest access to communities for their livelihoods; (6) advance social forestry; (7) maintain law enforcement; and (8) contribute to the national economy and job creation.

Starting in the beginning of 2020, the early phase of President Jokowi's second term, the COVID-19 pandemic hit all aspects of life in this country, including the forestry sector. It has impeded efforts, and threatened to undermine much of what has been achieved in the last couple of years, especially because the national budget allocation for the forestry sector and the environment has been hugely reduced to cope with the escalating pandemic. Nevertheless, the government is still confident that by prioritizing activities and maintaining consistency with corrective measures, Indonesia can continue to progress towards sustainable forest management within a long-term vision of sustainable development.

During the pandemic era, the Government supported forestry business operations through relaxing some administrative procedures, delaying loan repayments, extending grace periods, optimizing state budgets, and accelerating labor-intensive activities through social forestry programs.

The government introduced e-learning systems, especially for smallholders engaged in social forestry, on how to adapt forestry practices and always comply with the COVID-19 prevention protocols. The government's e-learning systems for forest farmer groups are designed to help them submit Business Work Plans (RKU) which cover clusters of forests, food commodities, and the provision of agricultural inputs such as seeds, fertilizers, and pesticides.

Other measures undertaken during the COVID-19 pandemic include supporting wildlife in ex-situ conservation areas to survive by providing sufficient food, facilitating the non-timber forest product market, implementing law enforcement through restorative justice, and initiating a forest healing program in conservation areas.

By strengthening collaborative and complementary actions amongst the entire global community, Indonesia believes that the world will be able to build back better and will continue to achieve sustainable development goals.

As elaborately explained in the previous chapters, Indonesia has continuously improved forest governance through: (1) emphasizing President Jokowi's vision on ensuring the provision of a healthy environment for all citizens, which include sustainable forests; (2) permanently ceasing the issuance of new licenses in all primary forests and most peatlands; (3) enhancing the restoration of forest landscapes, social forestry, forest fire control, as well as improving the effectiveness of conservation management; (4) increasing the participation of the business community in land rehabilitation, such as the planting of 109,000 hectares of trees by the business community (a condition attached to 'lease use' permits), together with 100,000 to 200,000 hectares of trees planted annually by the state (depending upon budget available); (5) intensifying state-driven rehabilitation of 637,000 hectares of critical mangrove forests through 2024, out

of a nationwide total of 3.3 million hectares of mangrove forests; (6) encouraging habitat development, biodiversity conservation and wildlife corridors connecting their fragmented habitats; (7) maintaining conservation areas that have been recognized by World Heritage, Ramsar, and others; and (8) upscaling best practices developed in through applied research, forest education, and community forests.

Since 2018 the Ministry of Environment and Forestry has evaluated oil palm concessions and their licenses, and come up with 1.34 million hectares of forested areas within concessions that will be maintained as high conservation value forests.

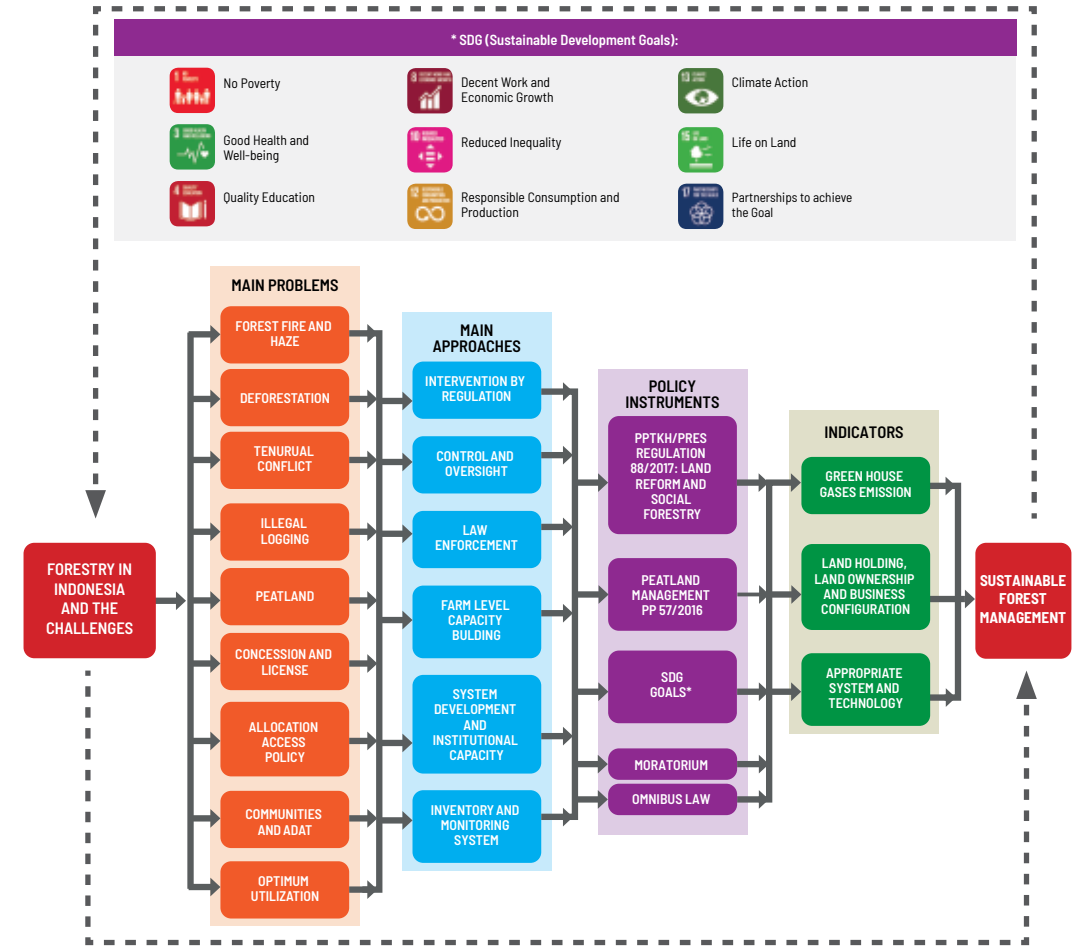
The Ministry of Environment and Forestry has consistently formulated, executed and evaluated its policies and regulations based on moral and scientific grounds. Moral values are enshrined in Article 33 of Indonesia's Constitution, which states that land, waters, and natural resources shall be under the jurisdiction of the State and used for the greatest benefit of the people. Hence, the constitution provides governing procedures for natural resources and moral guidance. Policies are also developed based on evidence and science. Researchers, academics, and professionals are involved in the formulation and implementation of forest policies. Theories, concepts, and innovative ideas such as the concept of ecocide, restorative justice, political ecology, and environmental governance have been exercised to support policies and regulations.

Environmental governance is of primary concern of managing forests in the ecosystem landscape. Indonesia's scientific approach is strengthened by national experts and the international community, both in the form of technical co-operation as well as intellectual contributions. With reference to the Rio de Janeiro-Brazil Earth Summit in 1992, the concept of sustainable development has been mainstreamed into the country's long-term management plan and is being implemented

with the support of practical tools and technologies. Sustainable development is “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (United Nations General Assembly, 1987, p. 43)¹⁰³

The three dimensions of sustainable development are the economic, social and environmental. Shown as the layers in a pyramid, the lowest layer is environmental, the middle layer is social, and the top layer is economic (see Cato, 2009). Cato (2009) also argues that the environmental dimension is the basis and provides a foundation for the social and economic dimensions. The role of good environmental governance as implemented in Indonesia includes translating and operationalizing a forest policy driven by (1) scientific development and understanding; (2) evolving conceptual frameworks; (3) solutions based on the results of work; (4) social relevance; (5) linkage to the planning process; and (6) efforts to influence policymakers. Environmental governance comprises the rules, practices, policies, and institutions that shape how humans and the environment interact (UNEP 2009). Environmental governance defines as interventions those which aim to change incentives, knowledge, institutions, decision making, and behavior related to the environment (Lemos & Agrawal, 2006). Good environmental governance takes into account the main interests and roles of actors in protecting the environment, such as NGOs, civil society, business, and government. Cooperation is critical to implementing effective governance for achieving sustainable development. Figure 7.1 depicts how environmental governance and sustainable development are operationalized by the Ministry of Environment and Forestry.

To be able to continue with corrective actions, to ensure more effective programs and a greater scale of interventions towards sustainable development goals, an adequate budget is needed. Mobilizing domestic resources and allocating them for prioritized programs will ensure the achievement of strategic objectives in managing Indonesian forest resources. However, since there is always a limitation in the availability of national budgets, strengthening international funding cooperation to fill national budget gaps is important. Result-Based Payments obtained by Indonesia from international cooperation is an example. This reflects the budgetary power of managing Indonesia's forests well. Thus, equipped with moral, intellectual and budgetary powers, Indonesia is ready to pursue sustainable forest management to not only provide prosperity for all Indonesian citizens, but also to contribute to the world by achieving Sustainable Development Goals.



► FIGURE 7.1. Forest governance in Indonesia: new paradigm, new concept, new policies

¹⁰³ United Nations General Assembly, 1987. Report of the World Commission on Environment and Development: Our Common Future, Oslo, Norway: United Nations General Assembly, Development and International Co-operation: Environment.

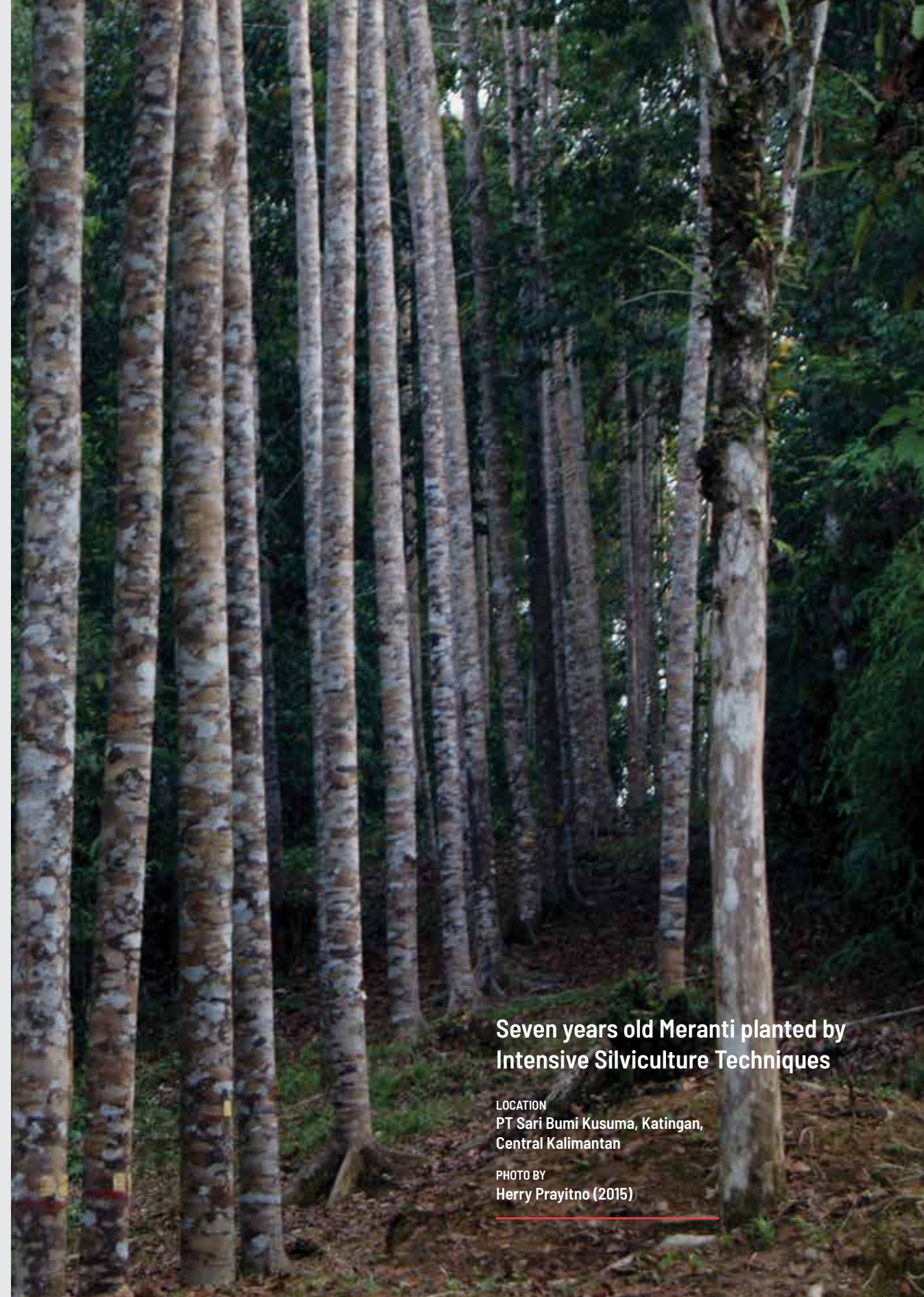
Bibliography

- [ADB]. 2009. *The Economics of Climate Change in Southeast Asia: A Regional Review*. Asian Development Bank.
- [BPS]. 2020. 15 Januari 2020: Berita Resmi Statistik. Jakarta: Badan Pusat Statistik. Retrieved from https://www.bps.go.id/website/materi_ind/materiBrsInd-20200115120531.pdf, 28 March 2020.
- [BRG]. 2020. *Status Restorasi Gambut 2016-2019*. Jakarta: Badan Restorasi Gambut.
- [Dephut]. 2008. *Penghitungan Deforestasi Indonesia Tahun 2008*. Jakarta: Pusat Inventarisasi dan Perpetaan Hutan, Badan Planologi Kehutanan, Departemen Kehutanan.
- [FAO]. 1998. *Forest resources assessment program. Working Paper 1*, Rome, Italy: Food and Agriculture Organization of the United Nations.
- [KemenPPN/Bappenas]. 2014. *Rencana Aksi Nasional Adaptasi Perubahan Iklim (RAN-API)*. Jakarta: Kementerian Perencanaan Pembangunan Nasional/Badan Perencanaan Pembangunan Nasional (BAPPENAS).
- [KemenPPN/BAPPENAS]. 2016. *Indonesian Biodiversity Strategy and Action Plan (IBSAP) 2015-2020*. Jakarta: Kementerian Perencanaan Pembangunan Nasional/BAPPENAS.
- [Kemhut]. 2011. *Penghitungan Deforestasi Indonesia Periode 2006-2009*. Jakarta: Direktorat Inventarisasi dan Pemantauan Sumber Daya Hutan, Direktorat Jenderal Planologi Kehutanan, Kementerian Kehutanan.
- [Kemhut]. 2012. *Penghitungan Deforestasi Indonesia Periode 2009-2011*. Jakarta: Direktorat Inventarisasi dan Pemantauan Sumber Daya Hutan, Direktorat Jenderal Planologi Kehutanan, Kementerian Kehutanan.
- [Kemhut]. 2013. *Penghitungan Deforestasi Indonesia Periode 2011-2012*. Jakarta: Direktorat Inventarisasi dan Pemantauan Sumber Daya Hutan, Direktorat Jenderal Planologi Kehutanan, Kementerian Kehutanan.
- [KLHK]. 2014. *Deforestasi Indonesia Periode 2012-2013*. Jakarta: Direktorat Inventarisasi dan Pemantauan Sumber Daya Hutan, Direktorat Planologi Kehutanan, Kementerian Lingkungan Hidup dan Kehutanan.
- [KLHK]. 2015. *Deforestasi Indonesia Periode 2013-2014*. Jakarta: Direktorat Inventarisasi dan Pemantauan Sumber Daya Hutan, Direktorat Jenderal Planologi Kehutanan, Kementerian Lingkungan Hidup dan Kehutanan.
- [KLHK]. 2017a. *Deforestasi Indonesia Periode 2014-2015*. Jakarta: Direktorat Inventarisasi dan Pemantauan Sumber Daya Hutan, Direktorat Jenderal Planologi Kehutanan dan Tata Lingkungan, Kementerian Lingkungan Hidup dan Kehutanan.
- [KLHK]. 2017b. *Deforestasi Indonesia Periode 2015-2016*. Jakarta: Direktorat Inventarisasi dan Pemantauan Sumber Daya Hutan, Direktorat Jenderal Planologi Kehutanan dan Tata Lingkungan, Kementerian Lingkungan Hidup dan Kehutanan.
- [KLHK]. 2017c. *Kehadiran Negara dalam Penanganan Konflik Tenurial di Kawasan Hutan*. Jakarta: Direktorat Jenderal Perhutanan Sosial dan Kemitraan Lingkungan, Kementerian Lingkungan Hidup dan Kehutanan.
- [KLHK]. 2017d. *Perkembangan Studi Kerentanan, Resiko, Dampak dan Adaptasi Perubahan Iklim: Tantangan dan Peluang*. Jakarta: Direktorat Adaptasi Perubahan Iklim, Direktorat Jenderal Pengendalian Perubahan Iklim, Kementerian Lingkungan Hidup dan Kehutanan.
- [KLHK]. 2017e. *Sistem Informasi dan Data Indeks Kerentanan*. Jakarta: Direktorat Adaptasi Perubahan Iklim, Direktorat Jenderal Pengendalian Perubahan Iklim, Kementerian Lingkungan Hidup dan Kehutanan.
- [KLHK]. 2017f. *Keputusan Menteri LHK No. SK.129/Menlhk/Setjen/PKL.0/2/2017 tentang Penetapan Peta Kesatuan Hidrologis Gambut Nasional*. Jakarta: Kementerian Lingkungan Hidup dan Kehutanan.
- [KLHK]. 2017g. *Belajar dari Lapangan: Kisah Keberhasilan Pemulihan Ekosistem di Kawasan Suaka Alam dan Kawasan Pelestarian Alam Secara Partisipatif*. Direktorat Jenderal Konservasi Sumber Daya Alam dan Ekosistem, Kementerian Lingkungan Hidup dan Kehutanan.
- [KLHK]. 2018a. *Luas Penutupan Lahan Indonesia di dalam dan di luar kawasan hutan Tahun 2017*. Jakarta: Direktorat Jenderal Planologi Kehutanan dan Tata Lingkungan, Kementerian Lingkungan Hidup dan Kehutanan.
- [KLHK]. 2018b. *Gambaran Pemanfaatan Kawasan Hutan Sebelum Tahun 2015 dan Target Tahun 2015 Kedepan*. Jakarta: Direktorat Jenderal Planologi Kehutanan dan Tata Kelola Lingkungan, Kementerian Lingkungan Hidup dan Kehutanan.
- [KLHK]. 2018e. *Kriteria dan Realisasi Sumber*
- [KLHK]. 2018d. *Keputusan Dirjen PPKL Nomor SK.40/PPKL/PKG/PKL.0/3/2018 Tentang Penetapan Status Kerusakan Ekosistem Gambut*, Kementerian Lingkungan Hidup dan Kehutanan.
- [KLHK]. 2019c. *Keputusan Menteri LHK No. SK.7434/MENLHK-PKTL/KUH/PLA.2/9/2019 tentang Peta Indikatif Lokasi Kawasan Hutan untuk Penyediaan Sumber Tanah Obyek Reforma Agraria (TORA) (Revisi IV)*. Jakarta: Kementerian Lingkungan Hidup dan Kehutanan.
- [KLHK]. 2020a. *Statistik Bidang Planologi Kehutanan dan Tata Lingkungan Tahun 2019*. Jakarta: Direktorat Jenderal Planologi Kehutanan dan Tata Lingkungan, Kementerian Lingkungan hidup dan Kehutanan.
- [KLHK]. 2020b. *Rencana Strategis Direktorat Jenderal Pengendalian Perubahan Iklim (PPI) Tahun 2020-2024*. Jakarta: Direktorat Jenderal Pengendalian Perubahan Iklim, Kementerian Lingkungan Hidup dan Kehutanan.
- [KLHK]. 2020c. *Rencana Strategis Direktorat Jenderal Pengelolaan Hutan Produksi Lestari Tahun 2020-2024*. Jakarta: Direktorat Jenderal Pengelolaan Hutan Produksi Lestari, Kementerian Lingkungan Hidup dan Kehutanan.
- [KLHK]. 2020d. *Laporan Inventarisasi Gas Rumah Kaca (GRK) dan Monitoring, Pelaporan, Verifikasi (MPV) 2019*. Jakarta: Kementerian Lingkungan Hidup dan Kehutanan, Direktorat Jenderal Pengendalian Perubahan Iklim, Direktorat Inventarisasi GRK dan Monitoring, Pelaporan, Verifikasi. ISBN: 978-623-92980-0-5.
- [KLHK]. 2020e. *Pengembangan Roadmap NDC Aspek Adaptasi*. Jakarta: Kementerian Lingkungan Hidup dan Kehutanan.
- [KLHK]. 2020f. *Peta Indikatif dan Alokasi Perhutanan Sosial (Revisi V) - Keputusan Menteri Nomor SK. 2111/MENLHK-PKTL/REN/PLA.0/4/2020*. Jakarta: Direktorat Jenderal Planologi Kehutanan dan Tata Lingkungan, Kementerian Lingkungan Hidup dan Kehutanan.
- [KLHK]. 2020g. *Indikasi Area Terbuka di Kawasan Suaka Alam dan Kawasan Pelestarian Alam*. Jakarta: Direktorat Jenderal Konservasi Sumber Daya Alam dan Ekosistem, Kementerian Lingkungan Hidup dan Kehutanan.
- [MoEF]. 2016a. *National Forest Reference Emission Level for Deforestation and Forest Degradation: In the Context of Decision 1/CP.16 para 70 UNFCCC (Encourages developing country Parties to contribute to mitigation actions in the forest sector): Post Technical Assessment by UNFCCC*. Jakarta: Directorate General of Climate Change, The Ministry of Environment and Forestry, Indonesia. ISBN: 978-602-73066-2-2 .
- [MoEF]. 2016b. *First Nationally Determined Contribution Republic of Indonesia*. Jakarta: Ministry of Environment and Forestry.
- [MoEF]. 2020. *Emission Reduction Report for The Indonesia-Norway Partnership (Revised Version)*. Jakarta: Directorate General of Climate Change, Ministry of Environment and Forestry, Republic of Indonesia.
- [Tim PKSP]. 2019. *Laporan Evaluasi 4 (Empat) Tahun Implementasi Percepatan Kebijakan Satu Peta (PKSP)*. Jakarta: Tim Percepatan Kebijakan Satu Peta, Kementerian Koordinator Bidang Perekonomian.

- [UNEP]. 2009. Environmental Governance, A Fact Sheet provided for 2009 UNFCCC Conference in Copenhagen. Nairobi, Kenya: United Nations Environment Programme (UNEP).
- Angelsen A, and D. Kaimowitz. 1999. Rethinking the causes of deforestation: Lessons from economic models. *The World Bank Research Observer*, 14: 73-98.
- Angelsen, A. and J.H. Ainembabazi. 2014. Using the forest transition to predict deforestation and set reference levels for REDD+. Paper to be presented at 5th World Congress of Environmental and Resource Economists, Istanbul, 28. June – 2. July 2014.
- APHI. 2019. Road Map Pembangunan Hutan Produksi Tahun 2019-2045. Jakarta.
- Awang, S.A. 2020. <http://sanafriawang.staff.ugm.ac.id/kehutanan-sosial-berbasis-reforma-agraria.html>.
- BPEE. 2018. Protection of Essential Ecosystem Areas. Presentation in Jakarta, 24 September 2018. Jakarta: Directorate of Essential Ecosystem Management (BPEE), Directorate General of Natural Resources and Ecosystem Conservation, Ministry of Environment and Forestry. In Indonesian language. Retrieved from <https://earthmind.org/sites/default/files/2018-09-VCA%20-%20Bahan%20VCA.%20Bu%20Mira.pdf> on 17 Nov 2019.
- Butler, R.A. 2016. The top 10 most biodiverse countries: What are the world's most biodiverse countries? *Mongabay*, 21 May 2016. <https://news.mongabay.com/2016/05/top-10-biodiverse-countries/>, accessed 10 January 2018.
- Cato, M. S. (2009). Green economics: an introduction to theory, policy and practice. *Journal of Economic Geography*, 10(3), 478–480. <https://doi.org/10.1093/jeg/lbp028>
- Contreras-Hermosilia, A. 2000. The underlying causes of forest decline. CIFOR Occasional Paper No. 30. Bogor, Indonesia: Center for International Forestry Research.
- DJKSDAE. 2018. MoEF Regulation Draft on Guidance for Protection of Essential Ecosystem Areas. Presentation in Bogor, 7 May 2018. Bogor: Directorate General of of Natural Resources and Ecosystem Conservation, Ministry of Environment and Forestry. In Indonesian language. Retrieved from http://puspijak.org/upload_files/Pedoman_Perlidungan_KEE_DAN_ABKT.pdf on 17 Nov 2019.
- Forum HarimauKita. 2019. Aum! Atlas Harimau Nusantara. Jakarta: Direktorat Konservasi Keanekaragaman Hayati, Direktorat Jenderal Konservasi Sumber Daya Alam dan Ekosistem, Kementerian Lingkungan Hidup dan Kehutanan bekerjasama dengan GEF UNDP.
- Geist, H.J. and E.F. Lambin. 2002. Proximate causes and underlying driving forces of tropical deforestation. *BioScience*, 52(2): 143-150.
- Hosonuma, N., M. Herold, V. De Sy, R.S. De Fries, M. Brockhaus, L. Verchot, A. Angelsen, and E. Romijn. 2012. An assessment of deforestation and forest degradation drivers in developing countries. *Environmental Research Letter*, 7: 12pp. <http://www.unesco.org/new/en/natural-sciences/environment/ecologicalsciences/man-and-biosphere-programme/>
- <https://crsreports.congress.gov | IF10244 · VERSION 39 · UPDATED>
- https://en.wikipedia.org/wiki/2019%E2%80%9320_Australian_bushfire_season
- <https://sipongi.menlhk.go.id>
- <https://www.cites.org/eng/disc/what.php>, accessed 20 December 2017.
- <https://www.ctvnews.ca/canada/1-8-million-hectares-of-canada-burned-by-forest-fires-so-far-this-year-1.4570733>
- <https://www.ramsar.org/>, accessed 20 December 2017.
- https://www.speciesplus.net/#/taxon_concepts?taxonomy=cites_eu&geo_entities_ids=16&geo_entity_scope=cites&page=1, accessed 20 December 2017.
- <https://www.statista.com/statistics/1036723/russia-area-burnt-by-forest-fires-by-region/>
- Instruksi Presiden Republik Indonesia No. 10 Tahun 2011 tanggal 20 Mei 2011 tentang Penundaan Pemberian Izin Baru dan Penyempurnaan Tata Kelola Hutan Alam Primer dan Lahan Gambut.
- Intruksi Presiden No. 3 Tahun 2020 tentang Pengendalian Kebakaran Hutan dan Lahan
- Kaimowitz, D. and A. Angelsen. 1998. Economic models of tropical deforestation: A review. Bogor, Indonesia: Center for International Forestry Research.
- Keputusan Dirjen KSDAE No. SK.500/KSDAE/SET/KSA.2/12/2017 tentang Kuota Pengambilan Tumbuhan Alam dan Penangkapan Satwa Liar Periode Tahun 2018.
- Keputusan Menteri LHK No. 129/Menlhk/Setjen/PKL.0/2/2017 tentang Penetapan Peta KHG Nasional.
- Keputusan Menteri LHK No. 130/Menlhk/Setjen/PKL.0/2/2017 tentang Penetapan Peta Fungsi Ekosistem Gambut (FEG) Nasional.
- Keputusan Menteri LHK No. SK.7434/MENLHK-PKTL/KUH/PLA.2/9/2019 tentang Peta Indikatif Lokasi Kawasan Hutan untuk Penyediaan Sumber Tanah Obyek Reforma Agraria (TORA) (Revisi IV).
- Keputusan Menteri LHK No. SK.755/Menlhk/KSDAE/KUM.0/9/2016.
- Keputusan Menteri LHK No. SK.8559/MENLHK-PKTL/IPSDH/PLA.1/12/2018 tanggal 17 Desember 2018 tentang Penetapan Peta Indikatif Penundaan Pemberian Izin Baru Pemanfaatan Hutan, Penggunaan Kawasan Hutan dan Perubahan Peruntukan Kawasan Hutan dan Areal Penggunaan Lain (Revisi XV).
- Keputusan Presiden Republik Indonesia No. 26 Tahun 1989 tentang Pengesahan Convention Concerning The Protection of The World Cultural and Natural Heritage.
- Keputusan Presiden Republik Indonesia No. 32 Tahun 1990 tentang Pengelolaan Kawasan Lindung, pasal 10.
- Keputusan Presiden Republik Indonesia No. 43 Tahun 1978 tentang Convention on International Trade in Endangered Species of Wild Fauna and Flora.
- Keputusan Presiden Republik Indonesia No. 48 Tahun 1991 tentang Pengesahan Convention on Wetlands of International Importance especially as Waterfowl Habitat.
- Kim, Y-S, J.S. Bae, L.A. Fisher, S. Latifah, M. Affi, S.M. Lee, and I-A, Kim. 2016. Indonesia's Forest Management Units: Effective intermediaries in REDD+ implementation? *Forest Policy and Economics*, 62: 69-77.
- Kissinger, G., M. Herold, V. De Sy. 2012. Drivers of Deforestation and Forest Degradation: A Synthesis Report for REDD+ Policymakers. Lexeme Consulting, Vancouver Canada.
- Margono, B.A., S. Turubanova, I. Zhuravleva, P. Potapov, A. Tyukavina, A. Baccini, S.Goetz, and M.C. Hansen. 2012. Mapping and monitoring deforestation and forest degradation in Sumatra (Indonesia) using Landsat time series data sets from 1990 to 2010. *Environmental Research Letter*, 7: 16pp
- Miles, L., Ravilious, C., García-Rangel, S., Lamo, X. d., Dargie, G., and Lewis, S. 2017. Carbon, biodiversity and land-use in the Central Congo Basin Peatlands. Cambridge, UK: United Nations Environment Programme.
- Nurwijayanto, A. 2020. Potensi Tumbuhan Bawah Kawasan Hutan Taman Nasional Gunung Merapi sebagai Penangkal Radikal Bebas 2,2-Difenil-1-Pikrilhidrazin (DPPH). *Disertasi*. Yogyakarta: Program Pascasarjana, Program Studi Ilmu Kehutanan, Fakultas Kehutanan, Universitas Gadjah Mada.
- Peraturan Menteri Kehutanan No. P.23/Menhut-II/2007 tentang Tata Cara Permohonan Izin Usaha Pemanfaatan Hasil Hutan Kayu dalam Hutan Tanaman Rakyat dalam Hutan Tanaman.
- Peraturan Menteri Kehutanan No. P.37/Menhut-II/2007 tentang Hutan Kemasyarakatan.
- Peraturan Menteri Kehutanan No. P.39/Menhut-II/ 2013 tentang Pemberdayaan Masyarakat setempat melalui Kemitraan Kehutanan.

- Peraturan Menteri Kehutanan No. P.48/Menhut-II/2014 tentang Tata Cara Pelaksanaan Pemulihan Ekosistem pada Kawasan Suaka Alam dan Kawasan Pelestarian Alam
- Peraturan Menteri Kehutanan No. P.49/Menhut-II/2008 tentang Hutan Desa.
- Peraturan Menteri Keuangan No. 131/PMK.07/2019 tentang Penggunaan, Pemantauan, dan Evaluasi Dana Bagi Hasil Sumber Daya Alam Kehutanan Dana Reboisasi. Accessible at: <http://www.djpk.kemenkeu.go.id/?p=13740>
- Peraturan Menteri LHK No. P.106/MENLHK/SETJEN/KUM.1/12/2018
- Peraturan Menteri LHK No. P.14/MENLHK/SETJEN/ KUM.1/2/2017 tentang Tata Cara Inventarisasi dan Penetapan Fungsi Ekosistem Gambut, Peraturan Menteri LHK No. P.15/MENLHK/SETJEN/ KUM.1/2/2017 tentang Tata Cara Pengukuran Muka Air Tanah di Titik Penaatan Ekosistem Gambut; Peraturan Menteri LHK No. P. 16/MENLK/SETJEN/KUM.1/2/2017 tentang Pedoman Teknis Pemulihan Fungsi Ekosistem Gambut; Peraturan Menteri LHK No. P.10/MENLHK/SETJEN/KUM.1/3/2019 tentang Penentuan, Penetapan dan Pengelolaan Puncak Kubah Gambut Berbasis Kesatuan Hidrologis Gambut; Peraturan Menteri LHK No. P.60/MENLHK/SETJEN/ KUM.1/10/2019 tentang Tata Cara Penyusunan, Penetapan dan Perubahan Rencana Perlindungan dan Pengelolaan Ekosistem Gambut
- Peraturan Menteri LHK No. P.15/MENLHK/SETJEN/ KUM.1/2/2017 tentang Tata Cara Pengukuran Muka Air Tanah di Titik Penaatan Ekosistem Gambut. Peraturan Menteri LHK No. P. 16/MENLK/SETJEN/ KUM.1/2/2017 tentang Pedoman Teknis Pemulihan Fungsi Ekosistem Gambut.
- Peraturan Menteri LHK No. P.2/Menlhk/Setjen/ KUM.1/1/2018 tentang Akses pada Sumber Daya Genetik Spesies Liar dan Pembagian Keuntungan atas Pemanfaatannya.
- Peraturan Menteri LHK No. P.21/MENLHK/SETJEN/KUM.1/4/2019 tentang Hutan Adat dan Hutan Hak.
- Peraturan Menteri LHK No. P.32/Menlhk-Setjen/2015 tentang Hutan Hak.
- Peraturan Menteri LHK No. P.39/MENLHK/SETJEN/KUM.1/6/2017 tentang Perhutanan Sosial di Wilayah Kerja Perum Perhutani.
- Peraturan Menteri LHK No. P.83/MENLHK/SETJEN/KUM.1/10/2016 tentang Perhutanan Sosial.
- Peraturan Pemerintah No. 57/2016 tentang Perubahan atas PP No. 71/2014 tentang Perlindungan dan Pengelolaan Ekosistem Gambut, Pasal I, angka 2, pasal 9 ayat (3), (4), dan (6).
- Peraturan Pemerintah Republik Indonesia No. 57 Tahun 2016 tentang Perubahan atas Peraturan Pemerintah Republik Indonesia Nomor 71 Tahun 2014 tentang Perlindungan dan Pengelolaan Ekosistem Gambut.
- Peraturan Pemerintah Republik Indonesia No. 71 Tahun 2014 tentang Perlindungan dan Pengelolaan Ekosistem Gambut; Peraturan Pemerintah Republik Indonesia No. 57 Tahun 2016 tentang Perubahan atas Peraturan Pemerintah Republik Indonesia Nomor 71 Tahun 2014 tentang Perlindungan dan Pengelolaan Ekosistem Gambut.
- Peraturan Presiden Republik Indonesia No. 72 Tahun 2020 tentang Perubahan atas Peraturan Presiden No. 54 Tahun 2020 tentang Perubahan Postr dan Rincian Anggaran Pendapatan dan Belanja Negara Tahun 2020, Lampiran VI-7. Accessible at: <http://www.djpk.kemenkeu.go.id/wp-content/uploads/2020/06/7a.-Perpres-Nomor-72-Tahun-2020-Lampiran-VI.1-10.pdf>
- Peraturan Presiden Republik Indonesia No. 9 Tahun 2016 tentang Percepatan Pelaksanaan Kebijakan Satu Peta.
- Prasetyo, LB., S.A. Wibowo, H. Kartodiharjo, F. Tonny, Haryanto, R. Sonaji, and Y. Setiawan. 2008. Land use and land-cover changes of conservation area during transition to regional autonomy: Case study of Balairaja Wildlife Reserve in Riau Province, Indonesia. *Tropics* 17 (2): 99-108.
- Purnamasari, R.S. 2010. Dynamics of smallscale deforestation in Indonesia: examining the effects of poverty and socio-economic development. *Unasylva* 234/235, Vol. 61.
- Romijn, E., J.H. Ainembabazi, A. Wijaya, M. Herold, A. Angelsen, L. Verchot, and D. Murdiyarso. 2013. Exploring different forest definitions and their impact on developing REDD+ reference emission levels: A case study for Indonesia. *Environmental Science & Policy*, 33: 246-259.
- Sabiham. 2008. Suitability and Sustainability Aspect of Peatland Utilization for Agriculture. Bogor: Indonesian Center for Land Resources Research and Development. Unpublished.
- Siscawati, M. 1998. Underlying causes of deforestation and forest degradation in Indonesia: A case study on forest fire. IGES International Workshop on Forest Conservation Strategies for the Asia and Pacific Region, Kanagawa-Japan, 21-23 July 1998.
- SK.7099/MENLHK-PKTL/IPSDH/PLA.1/8/2019 tanggal 28 Agustus 2019 tentang Penetapan Peta Indikatif Penghentian Pemberian Izin Baru Hutan Alam Primer dan Lahan Gambut Tahun 2019.
- Sunderlin, W.D. and I.A.P. Resosudarmo. 1996. Rates and causes of deforestation in Indonesia: Towards a resolution of the ambiguities. CIFOR Occasional Paper No. 9. Bogor, Indonesia: Center for International Forestry Research.
- Syaufina. 2015. Research Status on the Relationship between Forest Fire and Biodiversity and Human Dimension in Indonesia. In: Damayanti EK, Fernandez JC, editors. Proceedings of the National Seminar on Promoting Research on Forest and Land Fire Mitigation, Adaptation and Impact to Human and Biodiversity, held in Bogor-Indonesia, April 28, 2015. Bogor (ID): SEAMEO BIOTROP.
- Undang-undang No. 15 Tahun 2017 tentang Anggaran Pendapatan dan Belanja Negara Tahun 2018.
- Undang-undang No. 20 Tahun 2019 tentang Anggaran Pendapatan dan Belanja Negara Tahun 2020. Accessible from: <https://www.kemenkeu.go.id/media/13535/uu-apbn-2020.pdf>
- Undang-Undang Republik Indonesia No. 11 Tahun 2013 tentang Pengesahan Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from Their Utilization to Convention on Biological Diversity (Protokol Nagoya tentang Akses Pada Sumber Daya Genetik dan Pembagian Keuntungan yang Adil dan Seimbang yang Timbul dari Pemanfaatan atas Konvensi Keanekaragaman Hayati).
- Undang-Undang Republik Indonesia No. 21 Tahun 2004 tentang Pengesahan Cartagena Protocol on Biosafety to the Convention on Biological Diversity (Protokol Cartagena tentang Keamanan Hayati atas Konvensi tentang Keanekaragaman Hayati).
- Undang-Undang Republik Indonesia No. 26 Tahun 2014 tentang Pengesahan ASEAN Agreement on Transboundary Haze Pollution (Persetujuan ASEAN tentang Pencemaran Asap Lintas Batas).
- Undang-Undang Republik Indonesia No. 4 Tahun 2011 tentang Informasi Geospasial.
- Undang-Undang Republik Indonesia No. 5 Tahun 1994 tentang Pengesahan United Nations Convention on Biological Diversity (Konvensi Perserikatan Bangsa Bangsa mengenai Keanekaragaman Hayati).
- Verburg PH, Veldkamp TA, Bouma J, 1999. Land use change under conditions of high population pressure: the case of Java. *Global Environmental Change* 9: 303-312.
- Verolme, Hans J.H., Moussa, Juliette, April 1999. Addressing the Underlying Causes of Deforestation and Forest Degradation - Case Studies, Analysis and Policy Recommendations. Biodiversity Action Network, Washington, DC, USA. x + 141 pp.
- United Nations General Assembly. 1987. Report of the World Commission on Environment and Development: Our Common Future, Oslo, Norway: United Nations General Assembly, Development and International Co-operation: Environment.

- Wicke, B., R. Sikkema, V. Dornburg, M. Junginger, and A. Faaij. 2008. Drivers of land use change and the role of palm oil production in Indonesia and Malaysia: Overview of past developments and future projections. ISBN 978-90-8672-032-3. Utrecht, The Netherlands: Science, Institute for Sustainable Development and Innovation, Utrecht University.
- Wiratno. 2017. Perebutan Ruang Kelola: Refleksi Perjuangan dan Masa Depan Perhutanan Sosial di Indonesia. Pidato Dies Natalis Fakultas Kehutanan UGM ke 54, 16 November 2017. Yogyakarta: Direktorat Jenderal Konservasi Sumberdaya Alam dan Ekosistem, Kementerian Lingkungan Hidup dan Kehutanan.
- Wiratno. 2019. Sepuluh Cara (Baru) Kelola Kawasan Konservasi Indonesia: Membangun "Organisasi Pembelajar". Jakarta: Direktorat Jenderal Konservasi Sumber Daya Alam dan Ekosistem, Kementerian Lingkungan Hidup dan Kehutanan.
- Zikri, M. 2009. An econometric model for deforestation in Indonesia. Working Paper in Economics and Development Studies. Bandung, Indonesia: Center for Economic and Development Studies, Department of Economics, Padjadjaran University.



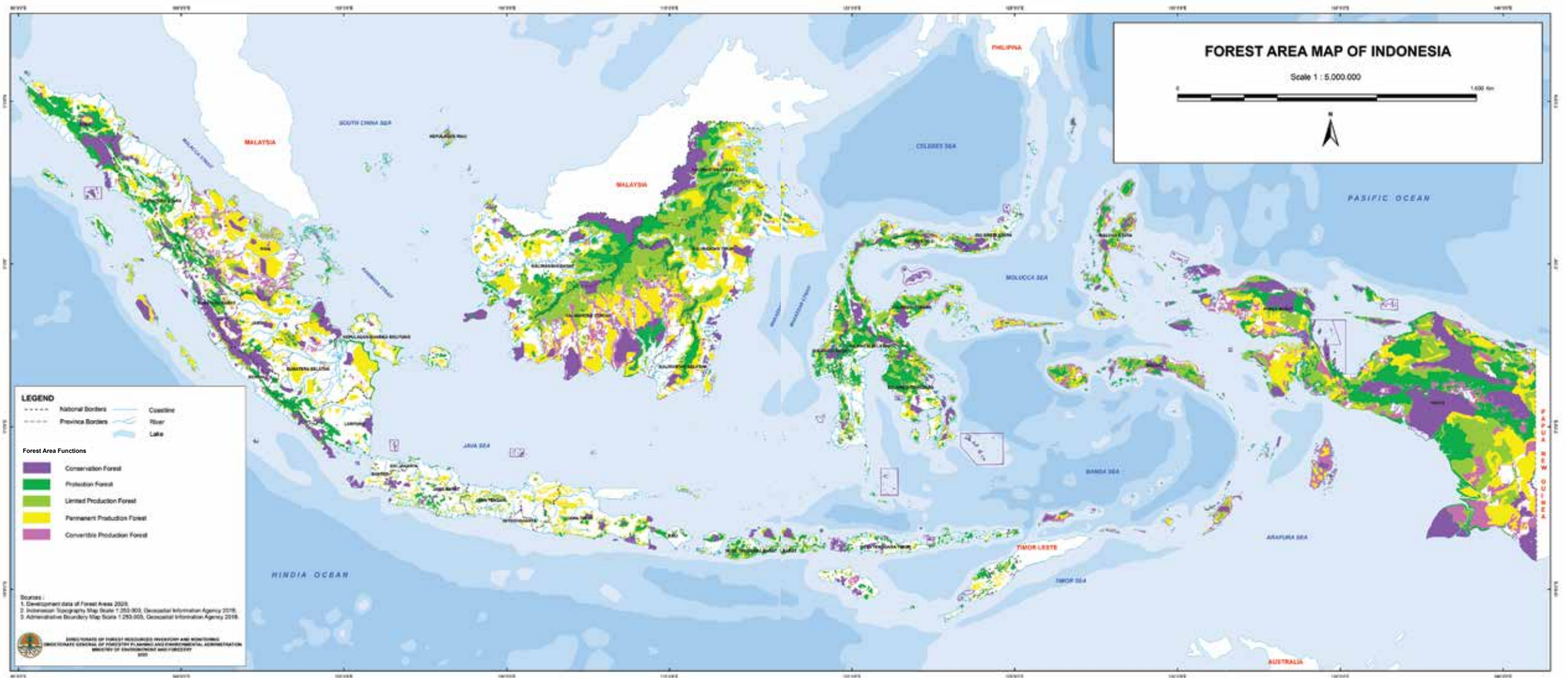
**Seven years old Meranti planted by
Intensive Silviculture Techniques**

LOCATION
PT Sari Bumi Kusuma, Katingan,
Central Kalimantan

PHOTO BY
Herry Prayitno (2015)

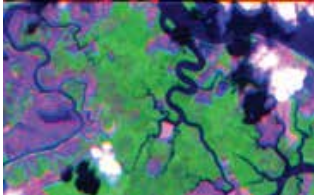

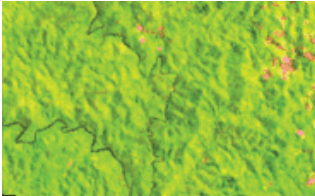
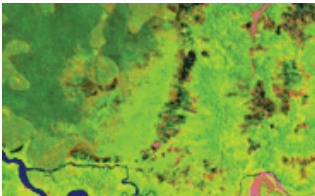

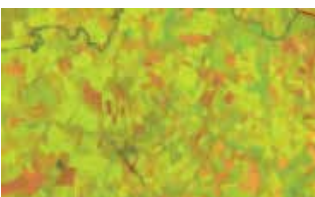
Appendices

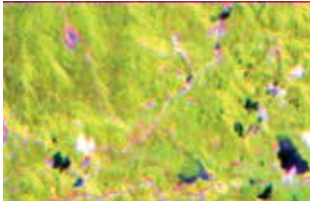

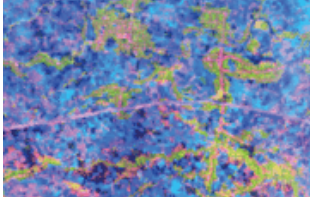

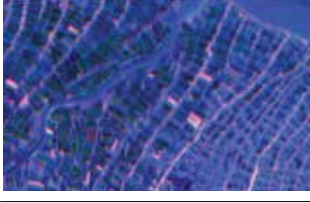
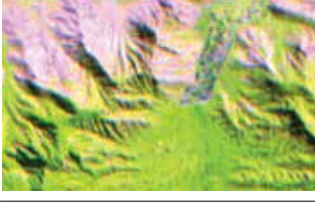
Appendix 1: Forest area map of Indonesia

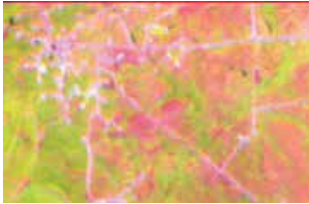


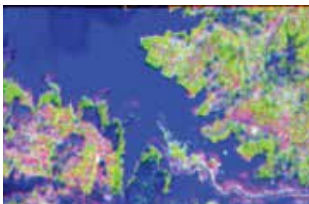
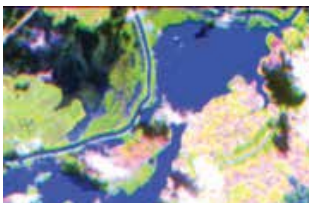
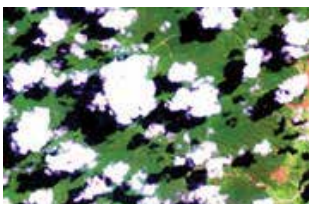


Appendix 2: The 23 land cover classes of Indonesia (Margono et al., 2016)

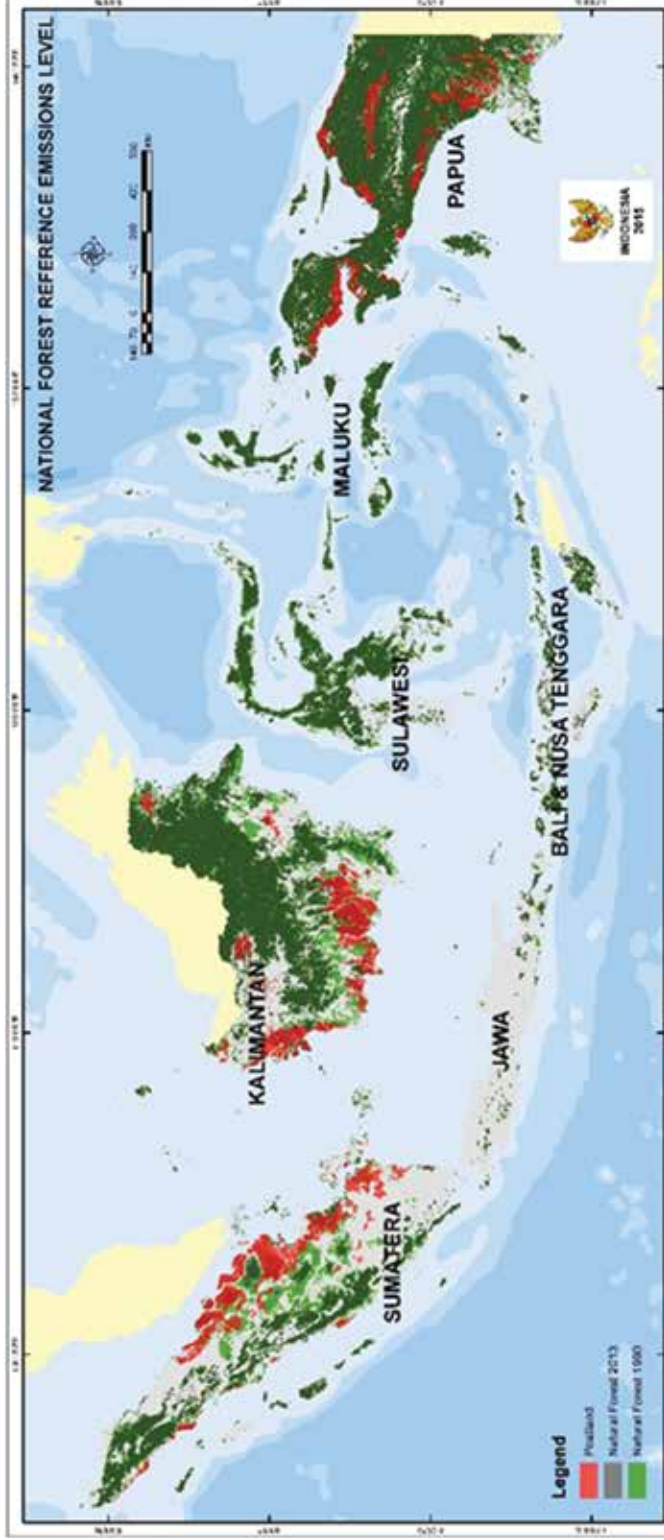
Classes	Code	Description	Monogram
FOREST			
Primary dryland forest (<i>Hutan lahan kering primer</i>)	2001 (Hp)	Natural tropical forests grow on non-wet habitat including lowland, upland, and montane forests with no signs of logging activities. The forest is including pygmies and heath forest and forest on ultramafic and lime-stone, as well as coniferous, deciduous and mist or cloud forest.	
Secondary dryland forest (<i>Hutan lahan kering sekunder</i>)	2002 (Hs)	Natural tropical forest grow on non-wet habitat including lowland, upland, and montane forests that exhibit signs of logging activities indicated by patterns and spotting of logging. The forest is including pygmies and heath forest and forest on ultramafic and lime-stone, as well as coniferous, deciduous and mist or cloud forest.	
Primary swamp forest (<i>Hutan rawa primer</i>)	2005 (Hrp)	Natural tropical forest grow on wet habitat including brackish swamp, sago and peat swamp, with no signs of logging activities	
Secondary swamp forest (<i>Hutan rawa sekunder</i>)	20051 (Hrs)	Natural tropical forest grow on wet habitat including brackish swamp, sago and peat swamp that exhibit signs of logging activities indicated by patterns and spotting of logging	
Primary mangrove forest (<i>Hutan mangrove primer</i>)	2004 (Hmp)	Inundated forest with access to sea/brackish water and dominated by species of mangrove and Nipa (<i>Nipa frutescens</i>) that has no signs of logging activities	

Secondary mangrove forest (<i>Hutan mangrove sekunder</i>)	20041 (Hms)	Inundated forest with access to sea/brackish water and dominated by species of mangrove and Nipa (<i>Nipa frutescens</i>) that exhibit signs of logging activities indicated by patterns and spotting of logging	
Plantation forest (<i>Hutan tanaman</i>)	2006 (Ht)	Planted forest including areas of reforestation, industrial plantation forest and community plantation forest	
NON-FOREST			
Dry shrub (<i>Semak belukar</i>)	2007 (B)	Highly degraded log over areas on non-wet habitat that are ongoing process of succession but not yet reach stable forest ecosystem, having natural scattered trees or shrubs	
Wet shrub/swampy shrub (<i>Semak belukar rawa</i>)	20071 (Br)	Highly degraded log over areas on wet habitat that are ongoing process of succession but not yet reach stable forest ecosystem, having natural scattered trees or shrubs	
Savanna and Grasses (<i>Savanna dan padang rumput</i>)	3000 (S)	Areas with grasses and scattered natural trees and shrubs. This is typical of natural ecosystem and appearance on Sulawesi Tenggara, Nusa Tenggara Timur, and south part of Papua island. This type of cover could be on wet or non-wet habitat	
Pertanian lahan kering (<i>Pure dry agriculture</i>)	20091 (Pt)	All land covers associated to agriculture activities on dry/non-wet land, such as tegalan (moor), mixed garden and ladang (agriculture fields)	

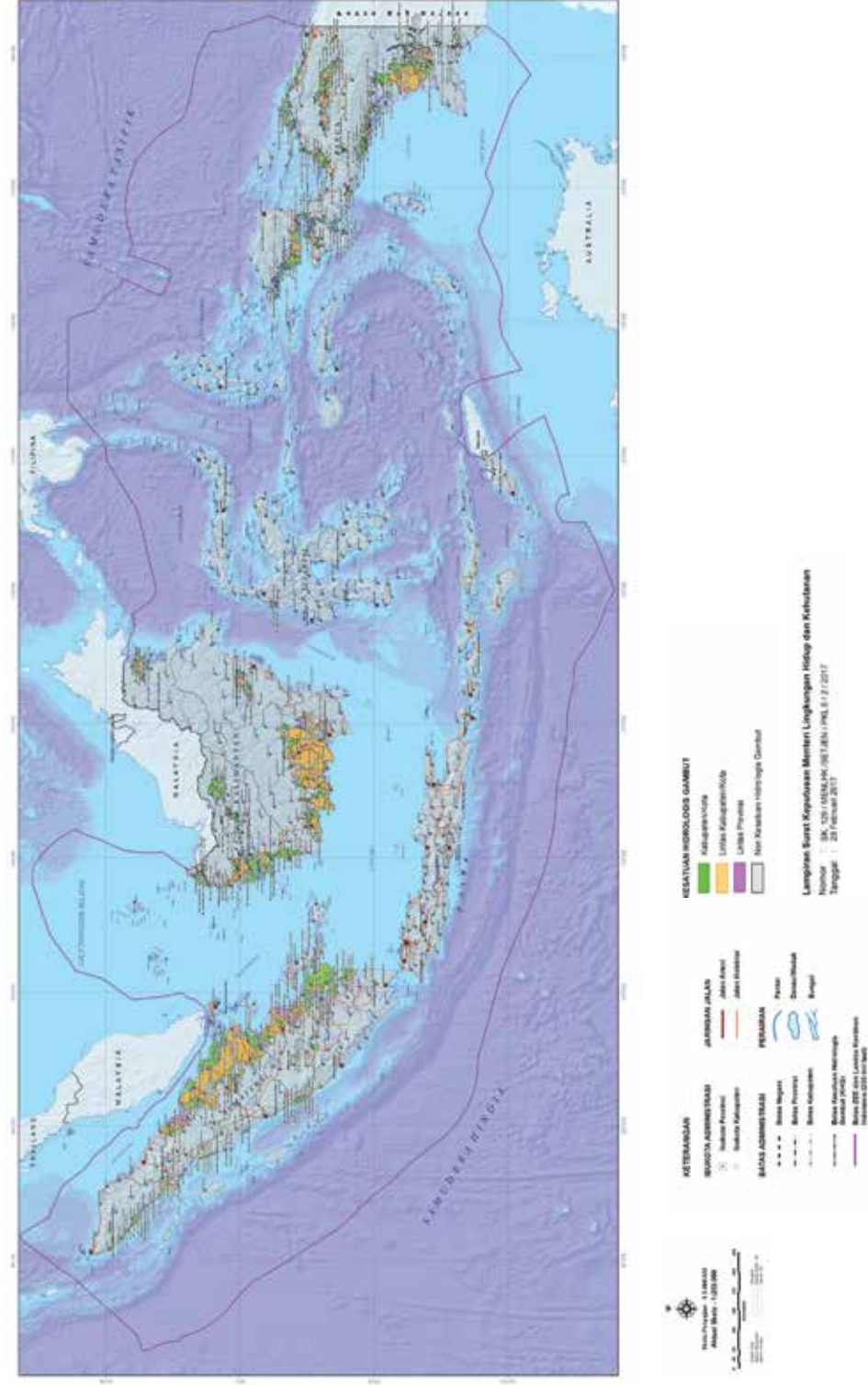
Mixed dry agriculture (Pertanian lahan kering campur semak)	20092 (Pc)	All land covers associated to agriculture activities on dry/non-wet land that mixed with shrubs, thickets, and log over forest. This cover type often results of shifting cultivation and its rotation, including on karts	
Estate crop (Perkebunan / kebun)	2010 (Pk)	Estate areas that has been planted, mostly with perennials crops or other agriculture trees commodities	
Paddy field (Sawah)	20093 (Sw)	Agriculture areas on wet habitat, especially for paddy, that typically exhibit dyke patterns (pola pematang). This cover type includes rainfed, seasonal paddy field, and irrigated paddy fields	
Transmigration areas (Area transmigrasi)	20122 (Tr)	Kind of unique settlement areas that exhibit association of houses and agroforestry and/or garden at surrounding	
Fish pond/aquaculture (Tambak)	20094 (Tm)	Areas exhibit aquaculture activities including fish ponds, shrimp ponds or salt ponds	
Bare ground/Bare soil (Lahan terbuka)	2014 (T)	Bare grounds and areas with no vegetation cover yet, including open exposure areas, craters, sandbanks, sediments, and areas post fire that has not yet exhibit regrowth	

Mining areas (Pertambangan)	20141 (Tb)	Mining areas exhibit open mining activities such as open-pit mining including tailing ground	
Settlement areas (Permukiman/lahan terbangun)	2012 (Pm)	Settlement areas including rural, urban, industrial and other settlements with typical appearance	
Port and harbor (Bandara/ pelabuhan)	20121 (Bdr/ Plb)	Sighting of port and harbor that big enough to independently delineated as independent object	
Open water (Tubuh/badan air)	5001 (A)	Sighting of open water including ocean, rivers, lakes, and ponds	
Open swamp (Rawa)	50011 (Rw)	Sighting of open swamp with few vegetation	
Clouds and no-data (Awan dan tidak ada data)	2500 (Aw)	Sighting of clouds and clouds shadow with size more than 4 cm2 at 100.000 scales display	

Appendix 3: National FREL map



Appendix 4: Map of national peat hydrological unit distribution



Appendix 5: List of *adat* forest areas and indicative *adat* forest areas

No.	Adat Forest	Province	District	Sub-District	Village	Area Size (Ha)	Year
A. Adat forest stipulated by the Minister of environment and Forestry							
1	Hutan Adat Tenganan Pengringsingan	Bali	Karangasem	Manggis	Tenganan	591	2019
2	Hutan Adat Desa Adat Kukuh	Bali	Tabanan	Marga	Kukuh	9	2019
3	Hutan Adat Tri Kayangan Belimbing	Bali	Tabanan	Pupuan	Belimbing	21	2019
4	Hutan Adat Kasepuhan Karang	Banten	Lebak	Muncang	Jagaraksa	486	2016
5	Hutan Adat Kasepuhan Pasir Eurih	Banten	Lebak	Sobang	Sindanglaya	580	2019
6	Hutan Adat Kasepuhan Cirompang	Banten	Lebak	Sobang	Cirompang	306	2019
7	Hutan Adat Kasepuhan Citorek	Banten	Lebak	Cibeber	Citorek Sabrang, Citorek Kidul, Citorek Barat, Citorek tengah, Citorek Timur	1,647.00	2019
8	Hutan Adat Kasepuhan Cibarani	Banten	Lebak	Cirinten	Cibarani	490	2019
9	Hutan Adat Desa air Terjun	Jambi	Kerinci	Siulak	Air Terjun	39	2016
10	Hutan Adat Desa Sungai Deras	Jambi	Kerinci	Air Hangat	Sungai Deras	41	2016
11	Hutan Adat Desa Pungut Mudik	Jambi	Kerinci	Air Hangat	Pungut Mudik	276	2016
12	Hutan Adat Kemantan (Melayu Kerinci)	Jambi	Kerinci	Air Hangat Timur	Kemantan Kabalai, Kemantan Tinggi, Kemantan Mudik, Kemantan Raya, Kemantan Agung	452	2016
13	Hutan Adat Marga Serampas Desa Kermas	Jambi	Merangin	Jangkat	Rantau Kermas	130	2016
14	Hutan Adat Dusun Senamat Ulu	Jambi	Bungo	Batin III Ulu	Dusun Senamat Ulu	223	2017

No.	Adat Forest	Province	District	Sub-District	Village	Area Size (Ha)	Year
15	Hutan Adat Dusun Batu Kerbau	Jambi	Bungo	Pelepat	Dusun Batu Kerbau	326	2017
16	Hutan Adat Dusun Batu Kerbau	Jambi	Bungo	Pelepat	Dusun Batu Kerbau	323	2017
17	Hutan Adat Desa Pulau Tengah	Jambi	Merangin	Jangkat	Pulau Tengah	525	2017
18	Hutan Adat Desa Ngaol	Jambi	Merangin	Tabir Barat	Ngaol	278	2017
19	Hutan Adat Dusun Baru Pelepat	Jambi	Bungo	Pelepat	Dusun Baru Pelepat	821	2017
20	Hutan Adat Dusun Mengkadai Desa Temenggung	Jambi	Sarolangun	Limun	Temenggung	115	2018
21	Hutan Adat Bathin Baduo Batang Uleh	Jambi	Bungo	Tanah Tumbuh	Rambah	40	2018
22	Hutan Adat Nenek Limo Hiang Tinggi dan Nenek Empat Betung Kuning Hiang	Jambi	Kerinci	Sitinjau Laut	Hiang, Betung kuning, Muara Air	645	2018
23	Hutan Adat Ulu Air Lempur Lekuk Limo Puluh Tumbi	Jambi	Kerinci	Gunung Raya	Lempur Mudik, Lempur Hilir	745	2018
24	Hutan Adat Biang Sari	Jambi	Kerinci	Bukit Kerman	Pengasi Baru	175	2019
25	Hutan Adat Bahung Batu	Jambi	Kerinci	Siulak Mukai	Mukai Pintu	333	2019
26	Hutan Adat Lubuk Titing dan Maliki	Jambi	Kerinci	Air Hangat Timur	Pungut Hilir	151	2019
27	Hutan Adat Parbokalo Bungkan Yang Empat	Jambi	Kerinci	Siulak Mukai	Talang Tinggi, Mukai Tinggi	700	2019
28	Hutan Adat Bukit Kayu Sigi	Jambi	Kerinci	Gunung Kerinci	Tanjung Genting	34	2019
29	Hutan Adat Bukit Gedang	Jambi	Kerinci	Air Hangat	Pendung Hilir	150	2019
30	Hutan Adat Batin jo Pangulu Desa Meribung	Jambi	Sarolangun	Limun	Meribung	617	2018
31	Hutan Adat Pangulu Lareh Desa Temalang	Jambi	Sarolangun	Limun	Temalang	124	2018
32	Hutan Adat Batin	Jambi	Sarolangun	Limun	Lubuk Bedorong	240	2018

No.	Adat Forest	Province	District	Sub-District	Village	Area Size (Ha)	Year
33	Hutan Adat Titian Teras Dusun Kampung Pondok	Jambi	Sarolangun	Limun	Demang	138	2018
34	Hutan Adat Pangulu Desa Napal Melintang	Jambi	Sarolangun	Limun	Napal Melintang	83	2018
35	Hutan Adat Batin jo Pangulu Desa Mersip	Jambi	Sarolangun	Limun	Mersip	78	2018
36	Hutan Adat Kampung Kuta	Jawa Barat	Ciamis	Tambaksari	Karangpan- ingal	31	2018
37	Hutan Adat Kampung Jalawastu	Jawa Tengah	Brebes	Ketanggu- ngan	Ciseureuh	64	2019
38	Hutan Adat Dayak Iban Menua Sungai Itik Ketemanggungan Jalai Lintang	Kalimantan Barat	Kapuas Hulu	Embaloh Hulu	Batu Lintang	9,480.00	2019
39	Hutan Adat Tapang Sambas - Tapang Kemayau	Kalimantan Barat	Sekadau	Sekadau Hilir	Tapang Semadak	40.5	2017
40	Hutan Adat Dusun Melayang	Kalimantan Barat	Bengkayang	Seluas	Sahan	100	2018
41	Hutan Adat Dayak Bakati Dusun Segiring	Kalimantan Barat	Bengkayang	Tujuh Belas	Pisak	151	2019
42	Hutan Adat Dayak Bakati Dusun Sebalos	Kalimantan Barat	Bengkayang	Sanggau Ledo	Sango	126	2019
43	Hutan Adat Bukit Samabue	Kalimantan Barat	Landak	Menjalin	Sepahat, Menjalin, Lamoanak	900	2019
44	Hutan Adat Binua Laman Garoh	Kalimantan Barat	Landak	Sengah Temila	Keranji Mancal	210	2019
45	Hutan Adat Dayak Banyadu/ Bakati Banua Taria'k	Kalimantan Barat	Bengkayang	Teriak	Teriak, Sekaruh, Bana, Tubajur dan Temia Sio	258	2019
46	Hutan Adat Ketemenggungan Tae	Kalimantan Barat	Sanggau	Balai	Tae	2,189.00	2018
47	Hutan Adat Ketemenggungan Sisang Kampung Segumon	Kalimantan Barat	Sanggau	Sekayam	Lubuk Sabuk	651	2018
48	Hutan Adat Desa Pilang	Kalimantan Tengah	Pulang Pisau	Jabiren Raya	Pilang	102	2019
49	Hutan Adat Kampung Juaq Asa	Kalimantan Timur	Kutai Barat	Barong Tongkok	Juaq Asa	48.85	2017
50	Hutan Adat Kenegerian Petapahan	Riau	Kampar	Tapung	Petapahan	251	2019
51	Hutan Adat Kenegerian Kampa	Riau	Kampar	Kampa	Kampa, Koto Perambahan	157	2019

No.	Adat Forest	Province	District	Sub-District	Village	Area Size (Ha)	Year
52	Hutan Adat Ammatoa Kajang	Sulawesi Selatan	Bulukumba	Kajang	Tana Towa, Pattiroang, Bonto Baji, Malleleng	313.99	2016
53	Hutan Adat Marena	Sulawesi Selatan	Enrekang	Angeraja	Pekalobean & Singki	155	2018
54	Hutan Adat Orong	Sulawesi Selatan	Enrekang	Malua	Buntu Bantaun & Rante Mario	81	2018
55	Hutan Adat Uru	Sulawesi Selatan	Enrekang	Buntu Batu	Ledan	2,154.00	2019
56	Hutan Adat Tangsa	Sulawesi Selatan	Enrekang	Baroko	Benteng Alla Utara	115	2019
57	Hutan Adat Suku Wana Posangke	Sulawesi Tengah	Morowali utara	Bungku Utara	Taronggo	6,212.00	2016
58	Hutan Adat Kulawi	Sulawesi Tengah	Sigi	Kulawi	Marena	756	2017
59	Hutan Adat Masewo	Sulawesi Tengah	Sigi	Pipikoro	Masewo	829	2019
60	Hutan Adat Rimbo Tolang dan Rimbo Ubau Nagarikoto Besar	Sumatera Barat	Dharmasraya	Koto Besar	Nagari Koto Besar	35	2019
61	Hutan Adat Uma Saureinu	Sumatera Barat	Kepulauan Mentawai	Sipora Selatan	Saureinu	5,739.00	2019
62	Hutan Adat Uma Goiso Oinan	Sumatera Barat	Kepulauan Mentawai	Sipora Utara	Goiso Oinan	971	2019
63	Hutan Adat Uma Rokot	Sumatera Barat	Kepulauan Mentawai	Sipora Selatan	Matobe	114	2019
64	Hutan Adat Uma Usut Ngaik	Sumatera Barat	Kepulauan Mentawai	Sipora Selatan	Matobe	83	2019
65	Hutan Adat Tebat Benawa	Sumatera Selatan	Pagar Alam	Dempo Selatan	Kelurahan Penjalang	336	2018
66	Hutan Adat Ghimbe Peramunan	Sumatera Selatan	Muara Enim	Semende Darat Laut	Penyandingan	44	2019
TOTAL STIPULATED AREA OF ADAT FOREST (HA)						44,629.34	
B. Indicative area of Adat forest by Minister of Environment and Forestry							
1		Kalimantan Barat	Kapuas Hulu			13,815.39	2019
2		Bali	Tabanan			1.78	2019
3		Aceh	Aceh Besar			806.98	2019
4		Aceh	Aceh Jaya			68,864.00	2019
5		Aceh	Pidie			25,054.00	2019

No.	Adat Forest	Province	District	Sub-District	Village	Area Size (Ha)	Year
6		Bengkulu	Bengkulu Utara			99.7	2019
7		Bengkulu	Lebong			10,766.77	2019
8		Jambi	Bungo			602.68	2019
9		Jambi	Kerinci			24	2019
10		Jambi	Merangin			1,941.00	2019
11		Jambi	Sarolangun			1,276.00	2019
12		Riau	Kampar			18,705.82	2019
13		Sumatera Barat	Kepulauan Mentawai			4,205.06	2019
14		Sumatera Selatan	Musi Rawas Utara			0.36	2019
15		Sumatera Utara	Humbang Hasundutan			6,190.88	2019
16		Banten	Lebak			7,085.11	2019
17		Jawa Tengah	Brebes			0.22	2019
18		Jawa Barat	Bogor			624.22	2019
19		Kalimantan Barat	Ketapang			135	2019
20		Kalimantan Barat	Melawi			27,360.00	2019
21		Kalimantan Tengah	Lamandau			20	2019
22		Kalimantan Tengah	Seruyan			482.25	2019
23		Kalimantan Timur	Paser			7,236.55	2019
24		Kalimantan Utara	Malinau			328,691.52	2019
25		Sulawesi Barat	Mamuju			8,260.76	2019
26		Sulawesi Barat	Mamuju Tengah			2,140.00	2019
27		Sulawesi Selatan	Enrekang			2,495.73	2019
28		Sulawesi Selatan	Luwu Utara			126,795.00	2019
29		Sulawesi Selatan	Luwu Timur			683	2019

No.	Adat Forest	Province	District	Sub-District	Village	Area Size (Ha)	Year
30		Sulawesi Selatan	Tana Toraja			13	2019
31		Sulawesi Tengah	Morowali Utara			1,612.86	2019
32		Sulawesi Tengah	Poso			16,242.00	2019
33		Sulawesi Tengah	Sigi			59,239.00	2019
34		Sulawesi Tengah	Tojounauna			44,265.00	2019
35		Maluku	Seram Bagian Barat			49,627.72	2019
36		Maluku Utara	Halmahera Barat			165.89	2019
37		Maluku Utara	Halmahera Utara			58,004.00	2019
38		Papua	Jayapura			18,839.26	2019
39		Papua	Sarmi			0.43	2019
40		Papua Barat	Sorong			2,554.19	2019
TOTAL INDICATIVE AREA OF ADAT FOREST (HA)						914,927.13	
GRAND TOTAL						959,556.47	

Notes:

Hutan Adat = Adat Forest

SOURCE: KLHK, Data as of 26 May 2020

About the Editors



Chief Editor

DR. SITI NURBAYA obtained her PhD in Environmental Science in 1998 from a joint program between Bogor Agricultural University and Siegen University, Germany.

She began her career as a government officer at Lampung Provincial Government in 1981 and a few years later was appointed as the Deputy Head of Provincial Development Planning Agency. In 1998 she was transferred to Jakarta, assigned as the Director of Planning Bureau in the Ministry of Home Affairs, and in 2001 was promoted as the Secretary General of the Ministry. Her career then continued as Secretary General of the Regional Representative Council of the Republic of Indonesia (Indonesian Senate) for the period 2006-2013. She was also the first Secretary General of the Council. In October 2014, H.E. President Jokowi appointed her to join the Government Cabinet, to serve as the Minister for Environment and Forestry, a consolidated portfolio from the two previously Ministry of Forestry and Ministry of Environment, housing more than 16,000 national civil servants. For the second period of the Jokowi presidency, she was again entrusted to serve as the Minister for Environment and Forestry in October 2019. The Ministry also serves as the focal point for climate change, biodiversity and other environmental issues.

Siti Nurbaya has been active in domestic and international fora that make her frequently invited to address a wide spectrum of subjects such as: environmental and natural resources management, decentralization, bureaucracy, politics, democracy, parliament, political economy, women empowerment, geoscience, and geographic information systems.



Managing Editor

DR. EFRANSJAH was born in Lima Puluh, Asahan, North Sumatra in 1956. He has more than 35 years of experience working with government, international organizations, including the United Nations, and civil society. After graduating from the Faculty of Forestry in Bogor Agricultural University (IPB) in 1980, he pursued higher learning in France under government fellowship and obtained a Master and Doctoral degree in Sciences du Bois from Universite de Nancy 1, in 1988. He started his career with the Ministry of Forestry in Jakarta in 1980.

Dr. Efransjah was appointed as the CEO of WWF Indonesia for two terms from 2010 -2016. Prior to this, he served as Regional Coordinator for Southeast and Middle Asia for CIFOR, an international forestry research organization based in Bogor.

For more than six years he was in Kuala Lumpur, serving as the Chief Technical Advisor for UNDP's GEF large initiative for conservation of peat swamp forests in Pahang, Sarawak and Sabah. He was also based in Yokohama, Japan for 10 years working as the Projects Manager for Asia and Pacific in the International Tropical Timber Organization (ITTO) from 1993 – 2002.

Upon his retirement, he is appointed as a Senior Advisor to the Minister of Environment and Forestry (1986 - now).



**Ministry of Environment and Forestry
Republic of Indonesia**