Ministry of Environment and Forestry
Republic of Indonesia

THE STATE OF INDONESIA'S FORESTS 2018

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Straight and big standing tree at PT Gunung Meranti, Central Kalimantan Province.

LOCATION
Central Kalimantan Province

PHOTO BY
Rina Tektonia

Ministry of Environment and Forestry
Republic of Indonesia

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Jakarta, July 2018

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Preface

The State of Indonesia's Forests 2018 provides a broad and deep examination of the progress of the implementation of Indonesian government policies under the leadership of President Joko Widodo and Vice President Jusuf Kalla to manage Indonesia's forests, and participate in managing the global climate with sense of responsibility. For the Government, the State of Indonesia's Forests 2018 can be considered as a political document, reflecting participatory processes in achieving multistakeholder concensus in the management of Indonesian forests. The State of Indonesia's Forests 2018 was written by many authors from the Ministry of Environment and Forestry and presents the latest data and information on the management of Indonesia's tropical forests, while illustrating achievements that have been made to date.

Most of Indonesia's lands are Forest Area, an area to be maintained as a permanent forest. The remaining is mostly public land for non-forest uses, together with a relatively small amount of private property. The Forest Area must be preserved and utilized for the greatest importance of the people of Indonesia and support the sustainability of the global climate.

Hence, the Indonesian government is highly committed to promote sustainable forest resource management, and preventing deforestation and forest degradation, while the same time enhancing sustainable economic growth, such as through the development of Indonesia's sustainable timber certification system. In addition, since 2015 the Indonesian government has been working to resolve forest land tenure conflicts and making policy changes that enhance the participation of communities in forest management by structuring equitable land ownership and forest resources for the welfare of the Indonesian people, including through the national Land Reform Program (TORA) and the expansion of social forestry and encourage corporate to involve or partner with the communities.

The State of Indonesia's Forests 2018 explains the status of Forest Area and forest cover, demonstrating the government's high attention to safeguarding Indonesia's tropical forests that function as a global heritage and a living natural laboratory, ensuring long-term prosperity for society and the survival of human life. The State of Indonesia's Forests 2018 is an effort to be transparent about national programs and achievements, so that they may be known by all parties, including the world community. Multi-stakeholder engagement, especially with grassroots communities, is a policy priority. So is practicing good governance in forest management for the current and future generations.

We commend this publication as the first such policy and technical commentary on the forestry sector by the Government of Indonesia. We wish this publication to be taken in a constructive sense by those across the world who have an interest in the future of this critical natural resource of Indonesia, and who wish to see that future generations continue to appreciate it.

For Indonesia, the responsibility for managing forests is not merely the

responsibility of the government, but it is the responsibility everyone, ranging from the private sector to members of grassroots communities. Forest management is not just about the timber economy, or conservation of biodiversity, flora and fauna, but about the overall management of forests. The forest with its various functions must be beneficial for millions of Indonesians. This is why there has been a shift from forest management focused mainly on timber management, toward broader forest landscape ecosystem management, which includes social forestry and community-based forest management. The combination of forest management with better land use represents a strategic re-orientation toward managing forests more wisely, while taking into account customary values, social forestry, elements of agrarian reform, and law enforcement.

Indonesia is one of the world's most biologically diverse countries, contains the largest expanse of tropical peatlands in the world, and therefore has an important role for the world in maintaining the stability of global ecosystems. Indonesia stands ready to lead globally in the areas of forest conservation, biodiversity protection and wise peat ecosystems. The Government of Indonesia is now carrying out policy reviews and correcting measures to promote better management of forests and peat ecosystems. In particular, improved peat management in small and large plantations is underway to ensure a sharp drop in the occurrence of peat soil fires in forests, plantations and homegardens - and related negative effects on the environment, health, transportation and economic growth.

Efforts to implement sustainable forest management principles, reduce levels of degradation and deforestation, rehabilitate critical lands, and restore peatlands are all measures being taken by the government to mitigate greenhouse gas emissions. Indonesia has ratified the Paris Agreement, a global instrument to address climate change. The Paris Agreement will be fully implemented in Indonesia through national legislation, in order to ensure that climate change issues are fully mainstreamed into the country's development trajectory. Corrective actions will be properly implemented in a manner consistent with best governance practices, involving all leaders of the Ministry of Environment and Forestry, all the way down to those working at the technical level in the field.

Because it communicates these intentions, The State of Indonesia's Forests 2018 is a very important document. It is not only a medium of information about Indonesia's forests, but also an open, public, official document that provides information and outlines certain accomplishments for an international community that appears eager to better understand forest management in Indonesia. While the State of Indonesia's Forests 2018 highlights various corrective measures, it also provides space for accommodating relevant inputs and feedback, so that the international community can support the country and the people of Indonesia, to improve their well being.

I express my gratitude to all those who have helped and actively participated in the compilation of The State of Indonesia's Forests 2018; members of the writing team and all editors involved as well as contributors from universities, research institutes, NGOs, the private sector and representatives of customary institutions. High appreciation is given to the FAO and the team that has supported the Ministry of Environment and Forestry in the preparation of The State of Indonesia's Forests 2018, and the Norwegian government for its funding support.

Jakarta, July 2018

THE MINISTER OF ENVIRONMENT AND FORESTRY

SITI NURBAYA

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Efransjah and San Afri Awang 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 (DJPKTL); the Directorate General of Climate Change (DJPPI); the Directorate General of Pollution and Environmental Destruction Prevention (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); Directorate General of Social Forestry and Environmental Partnership (DJPSKL); and the Directorate General of Management of Watersheds and Protection Forests (DJPDASHL). The Secretariat General of the Ministry of Environment and Forestry (Secretariat General of MoEF) and Data and Information Center (Pusdatin) provided coordination support.

A wide range of national and international government agencies also provided valuable inputs.

The Government of the Republic of Indonesia expresses its appreciation to all individuals and entities that have contributed to the preparation of this document.

Abbreviations and Acronyms

AATHP	ASEAN Agreement on Transboundary Haze Pollution
ACCTHP	ASEAN Coordinating Center on Transboundary Haze Pollution
APL	*Areal Penggunaan Lain* (Other Use Area)
ASEAN	Association of South East Asian Nations
ASOEN	ASEAN Senior Officials on Environment
ASOF	ASEAN Senior Officials on Forestry
Babinsa	*Bintara Pembina Desa* (Village Guidance Non-Commissioned Military Officer)
BAPI	Biodiversity Action Plan of Indonesia
Bappenas	*Badan Perencanaan Pembangunan Nasional* (National Development Planning Agency)
BAU	Business as Usual
BBSDLP	*Balai Besar Penelitian dan Pengembangan Sumber Daya Lahan Pertanian* (Indonesian Center for Agricultural Land Resources Research and Development)
Bhabinkamtib-mas	*Bhayangkara Pembina Keamanan dan Ketertiban Masyarakat* (Public Order and Safety Development Police Officer)
BIG	*Badan Informasi Geospasial* (Geospatial Information Agency)
BK Kehati	*Balai Kliring Keanekaragaman Hayati* (Biodiversity Clearing House)
BKSDA	*Balai Konservasi Sumber Daya Alam* (Natural Resources Conservation Office)
BLU	*Badan Layanan Umum* (Public Service Agency)
BMKG	*Badan Meteorologi Klimatologi dan Geofisika* (Meteorology, Climatology and Geophysics Agency)
BNPB	*Badan Nasional Penanggulangan Bencana* (National Agency for Disaster Management)
BP REDD+	*Badan Pengelola Penurunan Emisi Gas Rumah Kaca dari Deforestasi, Degradasi Hutan dan Lahan Gambut* (Agency for Reduction of Greenhouse Gas Emissions from Deforestation, Forest Degradation and Peatland)
BP2LHK	*Balai Penelitian dan Pengembangan Lingkungan Hidup dan Kehutanan* (Center for Environment and Forestry Research and Development)
BPBD	*Badan Penanggulangan Bencana Daerah* (Regional Agency for Disaster Management)
BPDASHL	*Balai Pengelolaan Daerah Aliran Sungai dan Hutan Lindung* (Management of Watersheds and Protected Forest Office)
BPDASPS	*Bina Pengelolaan Daerah Aliran Sungai dan Perhutanan Sosial* (Watershed Management and Social Forestry Office)
BPDLH	*Badan Pengelola Dana Lingkungan Hidup* (Environmental Fund Management Agency)
BRG	*Badan Restorasi Gambut* (Peat Restoration Agency)
BRWA	*Badan Registrasi Wilayah Adat* (*Adat* Territory Registration Agency)
BUMDES	*Badan Usaha Milik Desa* (Village Owned Enterprise)

BUMN	*Badan Usaha Milik Negara* (State Owned Enterprise)
CA	*Cagar Alam* (Strict Nature Reserve)
CB	*Cagar Biosfer* (Biosphere Reserve)
CBD	Convention on Biological Diversity
CDM	Clean Development Mechanism
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CM1, CM2	Counter Measure 1, Counter Measure 2
CO_2	Carbon dioxide
CO_2e	Carbon dioxide equivalent
COP	Conference of the Parties
DAS	*Daerah Aliran Sungai* (Watershed)
DBH-DR	*Dana Bagi Hasil Dana Reboisasi* (Revenue Sharing from Reforestation Fund)
DJKSDAE	*Direktorat Jenderal Konservasi Sumber Daya Alam dan Ekosistem* (Directorate General of Natural Resources and Ecosystem Conservation)
DJPDASHL	*Direktorat Jenderal Pengendalian Daerah Aliran Sungai dan Hutan* Lindung (Directorate General of Management of Watersheds and Protecion Forest)
DJPHLHK	*Direktorat Jenderal Penegakan Hukum Lingkungan Hidup dan Kehutanan* (Directorate General of Forest and Environmental Law Enforcement)
DJPHPL	*Direktorat Jenderal Pengelolaan Hutan Produksi Lestari* (Directorate General of Sustainable Production Forest Management)
DJPKTL	*Direktorat Jenderal Planologi Kehutanan dan Tata Lingkungan* (Directorate General of Forestry Planology and Environmental Administration)
DJPPI	*Direktorat Jenderal Pengendalian Perubahan Iklim* (Directorate General of Climate Change)
DJPPKL	*Direktorat Jenderal Pengendalian Pencemaran dan Kerusakan Lingkungan* (Directorate General of Pollution Prevention and Environmental Destruction)
DJPSKL	*Direktorat Jenderal Perhutanan Sosial dan Kemitraan Lingkungan* (Directorate General of Social Forestry and Environmental Partnership)
DNA	Deoxyribonucleic Acid
DNPI	*Dewan Nasional Perubahan Iklim* (National Council on Climate Change)
DR	*Dana Reboisasi* (Reforestation Fund)
EFDB	Emission Factor Data Base
ETM+	Enhanced Thematic Mapper Plus
EU	European Union
FAO-UN	the Food and Agriculture Organization of the United Nations
FBEG	*Fungsi Budidaya Ekosistem Gambut* (Cultivation Function of Peat Ecosystem)
FEG	*Fungsi Ekosistem Gambut* (Peat Ecosystem Function)

FLEG	*Fungsi Lindung Ekosistem Gambut* (Protection Function of Peat Ecosystem)
FLEGT	Forest Law Enforcement, Governance and Trade
FMU	Forest Management Unit (*Kesatuan Pengelolaan Hutan*, KPH)
FORDIA	Forestry Research, Development, and Innovation Agency
FREL	Forest Reference Emission Level
GDP	Gross Domestic Product
GFRA	Global Forest Resources Assessments
GHG	Greenhouse Gas
GNRT	*Ganti Rugi Nilai Tegakan* (Stumpage Compensation)
ha	Hectare
HA	*Hutan Adat* (*Adat* Forest)
HCVF	High Conservation Value of Forest
HD	*Hutan Desa* (Village Forest)
HK	*Hutan Konservasi* (Conservation Forest)
HKm	*Hutan Kemasyarakatan* (Community Forest)
HL	*Hutan Lindung* (Protection Forest)
HP	*Hutan Produksi Tetap* (Permanent Production Forest)
HPK	*Hutan Produksi yang Dapat Dikonversi* (Convertible Production Forest)
HPT	*Hutan Produksi Terbatas* (Limited Production Forest)
HTI	*Hutan Tanaman Industri* (Industrial Plantation Forest)
HTR	*Hutan Tanaman Rak*yat (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	*Informasi Geospasial Tematik* (Thematic Geospatial Information)
INCAS	Indonesia Carbon Accounting System
INDC	Intended Nationally Determined Contribution
IPHPS	*Izin Pemanfaatan Hutan Perhutanan Sosial* (Permit for Social Forestry Utilization)
IPK	*Izin Pemanfaatan Kayu* (Timber Utilization Permit)
IPPKH	*Izin Pinjam Pakai Kawasan Hutan* (Forest Area Borrow-Use Permit)
IPPU	Industry Process and Production Use
ISPA	*Infeksi Saluran Pernafasan Akut* (Acute Respiratory Infection)
ISPO	Indonesian Sustainable Palm Oil
IUCN	International Union for Conservation of Nature
IUPHH	*Izin Usaha Pemanfaatan Hasil Hutan* (Business License for the Utilization of Forest Product)
IUPHHK	*Izin Usaha Pemanfaatan Hasil Hutan Kayu* (Business License for the Utilization of Timber Forest Products)

IUPHHK-HA	*Izin Usaha Pemanfaatan Hasil Hutan Kayu Hutan Alam* (Business License for the Utilization of Timber Forest Products in Natural Forest)
IUPHHK-HT	*Izin Usaha Pemanfaatan Hasil Hutan Kayu Hutan Tanaman* (Business License for the Utilization of Timber Forest Products in Plantation Forest)
IUPHHK-HTI	*Izin Usaha Pemanfaatan Hasil Hutan Kayu untuk Hutan Tanaman Industri* (Business License for Utilization of Timber Forest Products in Industrial Plantation Forest)
IUPHHK-RE	*Izin Usaha Pemanfaatan Hasil Hutan Kayu Restorasi Ekosistem* (Business License for the Utilization of Timber Forest Products in Ecosystem Restoration Forest)
IUPJL	*Izin Usaha Pemanfaatan Jasa Lingkungan* (Business License for the Utilization of Environmental Services)
IUP PAN-KAR-BON	*Izin Usaha Pemanfaatan Penyimpanan Karbon* (Business License for Utilization of Forest for Carbon Storage)
IUP RAP-KAR-BON	*Izin Usaha Pemanfaatan Penyerapan Karbon* (Business License for Utilization of Forest for Carbon Sequestration)
JIC	Joint Implementation Committee
JICA	Japan International Cooperation Agency
JIGN	*Jaringan Informasi Geospasial Nasional* (National Geospatial Information Network)
JOG	Joint Operations Graphics
KAN	*Komite Akreditasi Nasional* (National Accreditation Committee)
KEE	*Kawasan Ekosistem Esensial* (Essential Ecosystem Area)
KemenPPN	*Kementerian Perencanaan Pembangunan Nasional* (Ministry of National Development Planning)
Kementan	*Kementarian Pertanian* (Ministry of Agriculture)
KHDTK	*Kawasan Hutan Dengan Tujuan Khusus* (Special Purpose Forest Area)
KHG	*Kesatuan Hidrologis Gambut* (Peat Hydrological Unit)
KLHK	*Kementerian Lingkungan Hidup dan Kehutanan Republik Indonesia* (Ministry of Environment and Forestry, Republic of Indonesia/ MoEF)
KOFFCO System	Komatsu FORDA Fog Cooling System
KPA	*Kawasan Pelestarian Alam* (Nature Conservation Area)
KPH	*Kesatuan Pemangkuan Hutan* (Forest Management Unit, FMU in Perum Perhutani)
KPH	*Kesatuan Pengelolaan Hutan* (Forest Management Unit, FMU)
KPHK	*Kesatuan Pengelolaan Hutan Konservasi* (Conservation Forest Management Unit)
KPHL	*Kesatuan Pengelolaan Hutan Lindung* (Protection Forest Management Unit)
KPHP	*Kesatuan Pengelolaan Hutan Produksi* (Production Forest Management Unit)
KSA	*Kawasan Suaka Alam* (Sanctuary Reserve Area)
KSDAE	*Konservasi Sumber Daya Alam dan Ekosistem* (Conservation of Natural Resources and Ecosystems)

K/L	*Kementerian/Lembaga* (Ministries/Institutions)
LAPAN	*Lembaga Penerbangan dan Antariksa Nasional* (Indonesian National Institute of Aeronautics and Space)
LDCM	The Landsat Data Continuity Mission
LIPI	*Lembaga Ilmu Pengetahuan Indonesia* (Indonesian Institute of Sciences)
LULUCF	Land Use, Land-Use Change and Forestry
MAB	Man and Biosphere Program
MHA	*Masyarakat Hukum Adat* (*Adat* Law Community)
MODIS	Moderate Resolution Imaging Spectroradiometer
MoEF	Ministry of Environment and Forestry
MoFor	Ministry of Forestry
MoU	Memorandum of Understanding
MRV	Monitoring, Reporting and Verification
MSME	Micro, Small and Medium Enterprises
NDC	Nationally Determined Contribution
NFI	National Forest Inventory
NFMS	National Forest Monitoring System
NFP	National Focal Point
NGO	Non-Governmental Organization
NOAA	National Oceanic and Atmospheric Administration, U.S. Department of Commerce
NRS CC	National Registry System on Climate Change
NSDH	*Neraca Sumberdaya Hutan* (Balance of Forest Resource)
NTFP	Non-Timber Forest Product
OLI	Operational Land Imager
P3SEKPI	*Pusat Penelitian dan Pengembangan Sosial, Ekonomi, Kebijakan, dan Perubahan Iklim* (Center for Research and Development on Social Economy, Policy, and Climate Change)
Permenhut	*Peraturan Menteri Kehutanan* (Regulation of Minister of Forestry)
Perpres	*Peraturan Presiden* (Presidential Regulation)
PHPL	*Pengelolaan Hutan Produksi Lestari* (Sustainable Production Forest Management)
PIAPS	*Peta Indikatif Areal Perhutanan Sosial* (Indicative Map of Social Forestry Area)
PIPPIB	*Peta Indikatif Penundaan Pemberian Izin Baru* (Indicative Map on the Suspension of the Issuance of New Permits)
PKS	*Perjanjian Kerja Sama* (Cooperative Arrangement)
PLTB	*Pengolahan Lahan Tanpa Bakar* (Burn-Free Land Management)
PNBP	*Penerimaan Negara Bukan Pajak* (Non-Tax State Revenue)
POKJA PPS	*Kelompok Kerja Percepatan Perhutanan Sosial* (Working Group on Social Forestry Acceleration)
POLRI	*Kepolisian Republik Indonesia* (Indonesian National Police)
PPNS	*Penyidik Pegawai Negeri Sipil* (Civil Investigor)

PROPER	*Program Penilaian Peringkat Kinerja Perusahaan dalam Pengelolaan Lingkungan* (Corporate Performance Rating Program for Environmental Management)
PSDH	*Provisi Sumber Daya Hutan* (Forest Resource Royalty)
Pusdatin	*Pusat Data dan Informasi* (Data and Information Center)
RBI	*Rupa Bumi Indonesia* (Indonesian Base Map)
RBM	Resort-Based Management
REDD+	Reducing emissions from deforestation and forest degradation in developing countries
RHL	*Rehabilitasi Hutan dan Lahan* (Forest and Land Rehabilitation)
RIL- C	Reduced Impact Logging - Carbon
RKU	*Rencana Kerja Usaha* (Business Work Plan)
RPEG	*Rencana Pemulihan Ekosistem Gambut* (Peat Ecosystem Restoration Plan)
RPHJP	*Rencana Pengelolaan Hutan Jangka Panjang* (Long Term Forest Management Plan)
RPJMD	*Rencana Pembangunan Jangka Menengah Daerah* (Regional Medium-Term Development Plan)
RPJMN	*Rencana Pembangunan Jangka Menengah Nasional* (National Medium-Term Development Plan)
SEA	Strategic Environmental Assessment
SeHati Sumsel	*Strategi dan Rencana Aksi Keanekaragaman Hayati Sumatera Selatan* (South Sumatra Biodiversity Strategy and Action Plan, SSBSAP)
SFM	Sustainable Forest Management
SIGANIS	*Sistem Informasi Tenaga Teknis* (Technical Officer Information System)
SIGN-SMART	*Sistem Inventarisasi Gas Rumah Kaca Nasional, Sederhana, Mudah, Akurat, Ringkas, Transparan* (National Greenhouse Gas Inventory System - Simple, Easy, Accurate, Compact, Transparent)
SILK	*Sistem Informasi Legalitas Kayu* (Timber Legality Information System)
SLK	*Sertifikasi Legalitas Kayu* (Certification of Timber Legality)
Simontana	*Sistem Monitoring Hutan Nasional* (National Forest Monitoring System/NFMS)
SIMPONI	*Sistem Infromasi Penerimaan Negara Bukan Pajak Online* (Online Non-Tax State Revenue Information System)
SIPHPL	*Sistem Informasi Pengelolaan Hutan Produksi Lestari* (Sustainable Production Forest Management Information System)
SIPNBP	*Sistem Informasi Penerimaan Negara Bukan Pajak* (Non-Tax State Revenue Information System)
SIPUHH	*Sistem Informasi Penatausahaan Hasil Hutan* (Forest Product Administration Information System)

SIRPBBI	*Sistem Informasi Rencana Pemenuhan Bahan Baku Industri* (Information System for Planning Industrial Raw Material Fulfillment)
SIS	*Sistem Informasi Safeguards* (Safeguards Information System)
SK	*Surat Keputusan* (Decree)
SM	*Suaka Margasatwa* (Wildlife sanctuary)
SPBK	*Sistem Peringkat Bahaya Kebakaran* (Fire Hazard Rating System)
SPORC	*Satuan Polisi Hutan Reaksi Cepat* (Rapid Response Forest Police Unit)
SPOT	Satellite *Pour l'Observation de la Terre*
SRN	*Sistem Registri Nasional* (National Registry System)
SVLK	*Sistem Verifikasi Legalitas Kayu* (Timber Legality Verification System)
Tahura	*Taman Hutan Raya* (Grand Forest Park)
TB	*Taman Buru* (Hunting Park)
TM	Thematic Mapper
TMAT	*Tinggi Muka Air Tanah* (Water Table)
TN	*Taman Nasional* (National Park)
TNI	*Tentara Nasional Indonesia* (Indonesian Armed Forces)
TORA	*Tanah Obyek Reforma Agraria* (Agrarian Reform Land)
TPT	*Tempat Penampungan Terdaftar* (Registered Shelter)
TRHS	Tropical Rainforest Heritage of Sumatra
TWA	*Taman Wisata Alam* (Nature Recreation Park)
UNDP	United Nations Development Program
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
UNSPF	United Nation Strategic Plan on Forests
USD	United States Dollar
VNC	Voluntary National Contribution
VPA	Voluntary Partnership Agreement
WHC	World Heritage Committee
WPK	*Wilayah Pengukuran Kinerja* (Performance Measurement Area)

Glossary

***Adat* Community (*Masyarakat Adat*)**	See *Adat* Law Community, which is usually shortened to *Adat* Community.
***Adat* Forest (*Hutan Adat*, HA)**	An *Adat* Forest is a forest which is located in an *Adat* Law Community's area.
***Adat* Law Community (*Masyarakat Hukum Adat*, MHA)**	An *Adat* 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.
Community Forest (*Hutan Kemasyarakatan*, HKm)	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 (*Hutan Tanaman Rakyat*, HTR)	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 (*Hutan Konservasi*)	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 (*Hutan Produksi yang Dapat Dikonversi,* HPK)	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 (*Kawasan hutan*)	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 (*Kemitraan Kehutanan*)	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 (*Provisi Sumberdaya Hutan*, PSDH)	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 (*Taman Hutan Raya*)	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 refers to the change of land cover from forested to non-forested.
Limited Production Forest (*Hutan Produksi Terbatas*, HPT)	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 (*Hutan Produksi Tetap*).
National Park (*Taman Nasional*)	National Parks are the most common type of nature conservation area. They posess 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 (*Kawasan Pelestarian Alam*)	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 (*Taman Wisata Alam*)	A Nature Recreation Park is a type of nature conservation area mainly intended for recreation and tourism purposes.
Net Deforestation	Net deforestation refers to a change/reduction in forested land cover over a period of time.
Other Use Area (*Areal Penggunaan Lain*, APL)	Other Use Area refers to public lands which are not designated as Forest Area.
Peat	Peat is an organic material that naturally forms from imperfectly decomposed plant residues accumulated in swamps.
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 (*Kesatuan Hidrologis Gambut*, KHG)	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 (*Hutan Produksi Tetap*, HP)	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 (*Hutan Produksi*)	Production Forest is one of the three main classifications found in the Forest Area. Its main function is to produce forest products.
PROPER (*Program Penilaian Peringkat Kinerja Perusahaan dalam Pengelolaan Lingkungan*, Industrial's Environmental Performance Rating Program)	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 (*Hutan Lindung*)	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, the conservation of forest carbon stocks, sustainable management of forests, and enhancing forest carbon stocks in developing countries.
Reforestation	Reforestation refers to forest and land rehabilitation carried out inside of the Forest Area.
Reforestation Fund (*Dana Reboisasi*, DR)	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 (*Dana Bagi Hasil Dana Reboisasi*, DBH-DR)	Revenue Sharing (*Dana Bagi Hasil*, DBH) 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 (*Kawasan Suaka Alam*)	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.
Social Forestry	Social Forestry refers to sustainable forest management systems implemented within the Forest Area or titled forest/*Adat* forest lands by members of local communities or *Adat* 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, *Adat* Forests and Forestry Partnerships.
Strict Nature Reserve (*Cagar Alam*)	A sanctuary reserve area with a characteristic set of plants, animals and ecosystems, which must be protected and allowed to develop naturally.
Timber Legality Verification System (*Sistem Verifikasi Legalitas Kayu*, SVLK)	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 (*Hutan Desa*, HD)	A type of social forestry license which is managed by village-level authorities for the benefit and welfare of the village community.
Wildlife Sanctuary (*Suaka Margasatwa*)	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.

EXECUTIVE SUMMARY

1. Introduction

This book was developed by Ministry of Environment and Forestry (*Kementerian Lingkungan Hidup dan Kehutanan*), Republic of Indonesia, to provide information to the global community regarding the state of Indonesia's forests and its resources and regarding the efforts of the Indonesian Government to democratize the allocation of forest resources; to prevent and manage deforestation and the degradation of forest resources; and to ensure environmental justice and equality of opportunity for all members of Indonesia's communities, including *Adat* communities.

The Indonesian Government has expressed a strong commitment in achieving the democratization of the management and utilization of forest resources and has in recent years intensified its commitment and implement prevention of deforestation and the degradation of forests with some recent positive results; and implemented a system for the certification of sustainable management of forests also aimed at stopping illegal logging; and implemented a system to resolve conflicts related to forest tenure involving communities and surrounding areas, including *Adat* communities. The government is committed to addressing the role of forestry in climate change mitigation through its Nationally Determined Contribution and has intensified its commitment to resolve tenurial conflicts related to forest land. It has achieved this through a shift from a corporate-oriented approach to a more community-oriented approach intended to improve sustainable community-level economic development by ensuring more equitable access to land and forest resources, and thus promoting community prosperity.

This book consists of a brief introduction (Chapter 1), a description and analysis of Indonesia's Forest Areas (Chapter 2), a discussion of efforts to control and reduce deforestation (Chapter 3), a look at Indonesia's efforts to intensify its social forestry initiatives (Chapter 4); consideration of new directions and trends in the management of conservation areas (Chapter 5); an examination of issues related to the forestry sector's contribution to the national economy (Chapter 6); and concluding notes (Chapter 7).

2. An Overview of Indonesia's Forest Area

Indonesia is a big nation, with 120.6 million hectares or 63 percent of the nation's entire land area designated as the Forest Area (*Kawasan Hutan*). Most of Indonesia's remaining land area is made up of non-forest public lands, known as Areas for Other Purposes (*Areal Penggunaan Lain*, or APL). The Forest Area is managed in accordance with three functions. Production Forests (*Hutan Produksi*, HP), covers a total area of 68.8 million hectares, or 57 percent of the Forest Area. Conservation Forests (*Hutan Konservasi*), covers a total area of 22.1 million hectares or 18 percent (with an additional 5.3 million hectares of marine conservation areas). Protection Forests (*Hutan Lindung*) have watershed functions and cover the remaining 29.7 million hectares or 25 percent.

One of Indonesia's more famous conservation Forest Areas is Komodo National Park, a UN World Heritage Site and the home of the Komodo Dragon (*Varanus komodoensis*). Indonesia is located in the Coral Triangle, which is the most biologically-diverse area of ocean on the planet. Two of the nation's more well-known marine conservation areas are Wakatobi Marine, and the Raja Ampat Marine Protected Area.

Blessed with a tropical climate, Indonesia 17,000+ islands are located between two continents, Asia and Australia, and between two oceans, the Pacific Ocean and the Indian Ocean. Because of its geographical location, Indonesia has an extremely high level of biodiversity, and endemicity, and has a higher level of biodiversity than any other country in the world except Brazil and Colombia. Animal species consist of such well-known fauna as the Sumatran tiger, the Sumatran elephant, Sumatran and Javan rhinoceros, Kalimantan and Sumatran orangutan, midget buffalo, Komodo dragon and bird of paradise (*Paradisaea apoda*).

Indonesia's national development plan for 2015 to 2019 reiterates the status of Indonesia as a sovereign, independent and principled nation based on mutual cooperation. Nine priority agendas for national development are known as NAWACITA. The Ministry of Environment and Forestry (MoEF) is directly involved in at least three of these agendas. (1) Strengthening and implementing Indonesia's commitment to reforming its law enforcement and other systems to ensure that they are free of corruption, trustworthy, and in keeping with the dignity of the nation. (2) Increasing the nation's productivity at the community level and increasing its ability to compete in international markets. (3) Achieving economic autonomy by stimulating strategic sectors in the domestic economy.

As part of the global effort, the Government of Indonesia is committed and implemented to the International Agreement on Climate Change and showing progress in the implementation of its Nationally Determined Contribution (NDC), including aspects of mitigation and adaptation, whereby 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 has over 15 million ha of peatlands, which cover 12 percent of its forest land and are found right across Indonesia's four major Outer Islands of Sumatra, Kalimantan, Sulawesi and Papua. These peatlands, together with another 9.14 million hectares in associated landscapes, are managed under an area of land that is administratively designated as the Peat Hydrological Unit (*Kesatuan Hidrologis Gambut*, KHG), which covers a total area of 24.14 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; and maintaining soil fertility, as well as providing adequate food supply, energy supply for human life and germplasm for future use. In recognition of this vital role, the management of these forests by dedicated Protection Forest Management Units (*Kesatuan Pengelolaan Hutan Lindung*, or KPHL) is required at the ground level. With Indonesia's high level of biodiversity, appropriate management is required to ensure that all elements of the community benefit from these resources.

For more than five decades, forest resources have played a significant role in facilitating Indonesia's economic development. However, the performance of forest management in Indonesia has declined, and the economic contribution of forests has declined drastically, particularly since the advent of the reform era, with the associated implementation of regional autonomy policies. The Government has now begun to introduce 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.

3. Addressing the Causes of Deforestation and Forest Degradation

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 4 TM, Landsat 5 TM, 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 Environmental 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*). 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.

To improve the level of legal certainty in the management of Forest Areas, measures are being conducted to clarify the actual boundaries and administrative designations of Forest Areas in order show the actual location and legal status of the Forest Area; and to raise public recognition/legitimation regarding community rights to the use of land in some cases inside and also in areas 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 Permits, for the Utilization of Forest Resources and Forest Areas and Revisions to the Designation of Forest Areas and Other Use Areas (PIPPIB; more commonly known as the moratorium map). The map covers more than 66 million hectares of mostly primary (aka 'virgin') and/or peat forests, none of which are believed to be encumbered with resource licenses (for logging, plantations, mining, etc). Within the 66 million hectares, no new resource concessions may be awarded, for as long as the moratorium is in place. The moratorium was put into force in 2011 and was recently extended by President Joko Widodo in December 2017.

With Indonesia's expanding economy and increasing population, the demand for land is becoming more intense. Since 2015, the Government has launched an Equitable Economy (*Ekonomi Pemerataan*) policy to reduce inequality. The agrarian reform (*Tanah Obyek Reforma Agraria*, or 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 communities and/or *Adat* communities. The allocated land for TORA is 9 million hectares, where the status will be changed from Forest Area to APL.

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 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 in areas adjacent to the Forest Area.

Forest and land fires in Indonesia have attracted global attention since the devastating fires of 1982/1983 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 attracting even more global attention. In 2014, as one of Indonesia's commitment 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.

In the aftermath of the disastrous fires of 2015, President Joko Widodo has reaffirmed Indonesia's commitment to preventing fires with the intensity and effectiveness of such efforts escalating year-on-year. In 2016, the President explicitly emphasized the importance of prevention systems, systems of reward and punishment, and the importance of improving field reviews, law enforcement and synergies between central and local government agencies, and in peatland management. In 2017, the President emphasized the importance of early warning systems and called upon all elements of society to play a role in preventing forest and land fires through participation and support for air operations, law enforcement, effective forest and land governance, and improved coordination and synergy. In 2018, the President once again called on all elements of society to play a role in the prevention of forest and land fires through participation in early warning systems, improved synergies between all stakeholders, compliance with obligations, and full participation at the community level. In 2016 and 2017, the number of identified hotspots and cases of forest and land fires declined significantly, with this decline attributable to both intensified control measures and to climatic factors.

Indonesia plays an active role in forums to foster global cooperation to address this issue, particularly forums associated with the United Nations Framework Convention on Climate Change (UNFCCC). As a manifestation of its commitment to managing climate change, Indonesia has committed to a Nationally Determined Contribution (NDC) to unconditionally reduce GHG emissions by 29 percent through its own efforts (and up to 41 percent depending upon levels of international assistance) during the decade 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 the sector accounting for 17.2 percent of the 29 percent reduction, and 23 percent of the 41 percent reduction.

In response to guidance from the UNFCCC on how to reduce emissions from deforestation and forest degradation, and foster conservation, sustainable management of forests, and enhancement of forest carbon stocks (abbreviated as REDD+), and as part of Indonesia's commitment to implement the REDD+ scheme as part of its climate mitigation actions, Indonesia has developed a REDD+ infrastructure, consisting of a REDD+ national Strategy, a national Forest Reference Emissions Level (FREL), a National Forest Monitoring System (NFMS), and a Safeguards Information System (SIS). A national Monitoring, Reporting and Verification (MRV) system for REDD+ implementation that is supported by the NFMS has also been developed. In addition to its support for REDD+ implementation, Indonesia has erected a system for results-based payments and related instruments. Finally, as a part of the implementation of a transparency framework in the context of an agreement reached at the Paris Conference of Parties (COP), and the codification of that agreement into Indonesian national law, the government has built a "National Registry System on Climate Change" (NRS CC/SRN), for collecting information on all activities undertaken in support of climate change adaptation and mitigation, and presenting this information in a way that is clear, transparent and understandable.

In the specific case of emissions from the forestry sector and peatlands, for the period from 2000 to 2016, the average annual level of emissions stood at 709,409 Gg CO_2e. If emissions from peat fires were to be excluded, the average annual level of emissions would be 466,035 Gg CO_2e, with most of that coming from peatland decomposition, which emitted an annual average of 304,377 Gg CO_2e.

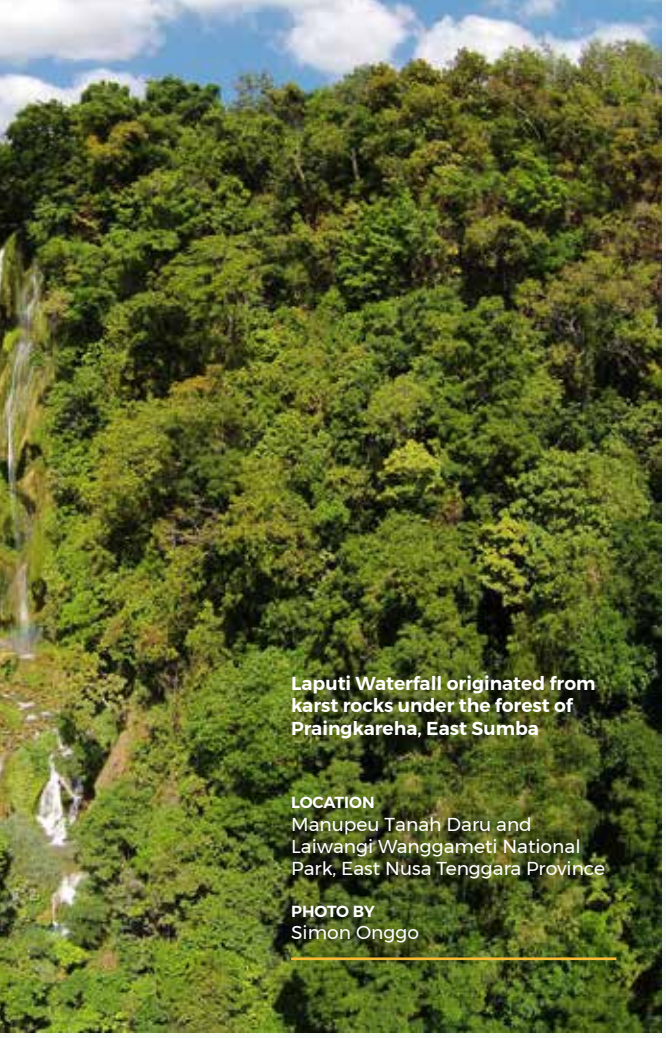
The implementation of mitigation measures has resulted in a reduction in the level of emissions, particularly in the case of emissions from peat fires. Post El-Nino in 2016, the level of emissions from peat fires declined to 90,267 Gg CO_2e, from the figure of 712,602 Gg CO_2e recorded in 2015. In 2017, the level of emissions from peat fires declined further, to 12,513 Gg CO_2e.

To prevent the degradation of peatlands and to improve the 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 peat ecosystems, based on the importance in preserving water balances, storing carbon, and conserving biodiversity.

Indonesia has a greater expanse of tropical peatlands than any nation in the world. An inventory of Indonesia's peat ecosystem has been completed, resulting in a national Peat Hydrological Unit (*Kesatuan Hidrologis Gambut*, KHG). Helpfully for planning and enforcement purposes, some KHGs have now been mapped in detail down to the provincial and district/city levels. These maps show that the total extent of Indonesia's peat ecosystem stand at 24.14 million hectares, of which around 9.16 million hectares are located in Sumatra, 8.39 million hectares in Kalimantan, 60 thousand hectares in Sulawesi, and 6.53 million hectares in Papua.

Notably, the Regulation on the Protection and Management of the Peat Ecosystem of 2014 as amended in 2016 mandates the retroactive restoration of certain deep peat areas converted by industrial timber and oil palm plantations, in the first instance by requiring these plantations to draft Peat Ecosystem Restoration Plans.

Restoration activities are also being conducted in logged-over areas of natural forest under the auspices of ecosystem restoration concessions (IUPHHK-RE). These concessions are being awarded to those who have pledged to return to the maximum extent possible logged over areas to their original state in terms of structure, composition and biodiversity conditions. The basic principles of ecosystem restoration concessions are to maintain forest functions (including the existing administrative status of Forest Areas); 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.



Laputi Waterfall originated from karst rocks under the forest of Praingkareha, East Sumba

LOCATION
Manupeu Tanah Daru and Laiwangi Wanggameti National Park, East Nusa Tenggara Province

PHOTO BY
Simon Onggo

4. Involvement of Communities in Forest Management

Prior to the 1990s, communities living in and around forests were not regarded by the state as having the potential and capacity to play a significant role in the management of forests. 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. From 2007 to 2013, a range of regulations were promulgated to support the role of communities in forest management. From 2007 to 2014, the process of granting legal access to forest resources to the community was relatively slow, with few permits being issued. As a corrective measure, President Joko Widodo has now super-charged the idea of social forestry by underscoring its potential community welfare functions.

Adat Forests (*Hutan Adat*) are one several categories of Social Forestry 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 concering *Adat* forests, the Ministry of Environment and Forestry issued a new regulation on Forest Rights in 2015. President Joko Widodo also recognized nine new *Adat* Forests, covering a total area of more than 13,000 hectares, at the State Palace on 30 December 2016. As of June 2018, there were 26 recognized *Adat* Forests across Indonesia, located in Jambi, Central Sulawesi, South Sulawesi, West Kalimantan, Banten, West Java and East Kalimantan provinces.

Forest Management Units (*Kesatuan Pengelolaan Hutan*, or KPH) are the most devolved form of management of forests by the Ministry of Environment and Forests. KPH take three forms, one of which is the Protection Forest Management Unit (*Kesatuan Pengelolaan Hutan Lindung*, KPHL). KPHL focus upon not only protection of forests but 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 the provision of facilitation and assistance to communities to utilize the protected area to support their welfare and to involve these communities in supporting the protection function of forests.

In addressing various issues in Indonesia's forestry sector, a number of research and development activities have been conducted. Among others are rehabilitation of peatlands in the aftermath of destructive forest and land fires, the captive breeding program of endangered wildlife species, bioprospecting for future (human) medicinal and protein needs, genetically-engineered high-quality seeds for selected important tree species, and the development of prioritized non-timber forest commodities used by communities.

5. New Paradigm of Conservation Area Management

Indonesia has 552 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 the so-called "Island Ecosystem" phenomenon. Indonesian conservation areas are increasingly operated using the resort-based management (RBM) tool.

Of 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 targets to increase the populations of these 25 threatened species by at least 10 percent from the baseline figure for these populations that was recorded in 2013. As evidence of tangible progress in achieving these population growth targets, in 2017 alone there were nine recorded births of endangered Indonesian wildlife species, including two tarsiers (*Tarsius fuscus*) in South Sulawesi, one anoa (*Buballus sp.*) in North Sulawesi, one female Sumatran elephant (*Elephas maximus sumatrensis*) in Aceh, three more female Sumatran elephants and one male Sumatran elephant in Lampung, and one female Sumatran orangutan (*Pongo abelii*) in Aceh.

A new species, the Tapanuli orangutan (*Pongo tapanuliensis*), was identified in 2017. Also, a tree species that was believed to be extinct, the *Dipterocarpus cinereus*, was rediscovered in Pulau Mursala, Tapanuli Tengah District, North Sumatra. Indonesia will propose a change to the status of the *Dipterocarpus cinereus*, which was declared extinct by the IUCN in 1998.

A large proportion of Indonesia's population still remains significantly dependent on forest resources. Of the 74,954 villages in Indonesia, about 25,800 villages, or 34.1 percent of the total, are forest fringe villages. Around 6,381 villages are on the fringe of the 22 million hectares of Conservation Forest, with a significant proportion of the population of these villages dependent on forest resources for their livelihoods.

In the period from 2015 to 2019, conservation programs have been conducted to enable communities to access and utilize non-timber forest products up to 62,000 hectares in 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 4,812 households in 62 villages living in and at the fringes of 15 National Parks.

As a mega-biodiversity country, Indonesia plays a highly strategic role in 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), 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. National Economic Contribution and the Private Sector

Indonesia's Production Forests cover an area of 68.8 million hectares, of which concessions have been granted for 30.6 million hectares, while the remaining 38.2 million hectares are without concessions. Of the area granted in concessions about 61 percent are for the selective felling of natural forest timber (IUPHHK-HA) while about 37

percent are for the planting of industrial timber (IUPHHK-HT). These 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. Looking to the future, active consideration is being given to whether non-timber forest products and ecosystem services can begin to make a more important contribution to the nation's economy.

Thirty six percent of concessions for the felling of natural forest timber are not working actively, notwithstanding the desire of the government to see the natural forests managed by these concessions thrive. A complicating factor is that social conflict must in most cases be managed by forest concession holders themselves. By 2017, 94 Industrial Plantation Forests (IUPHHK-HT), a third of the national total, had mapped their social conflicts.

Notwithstanding the social and other challenges faced by producers of natural forest and plantation timber, non-tax state revenues generated from economic activities in the forest area are significant. From 2011 to 2017, fees and royalties alone from the forestry sector amounted to USD 1.754 billion. Major forest-related fees and royalties include payments into the Reforestation Fund (*Dana Reboisasi*, or DR), the Forest Resource Royalty (*Provisi Sumber Daya Hutan*, or PSDH), the Forest Product Utilization Business License Fee (*Iuran Izin Usaha Pemanfaatan Hasil Hutan,* or *Iuran* IUPHH), the Environmental Services Utilization Business License Fee (*Iuran Izin Usaha Pemanfaatan Jasa Lingkungan*, or *Iuran* IUPJL), Forest Exploitation Violation Fines (*Denda Pelanggaran Eksploitasi Hutan*) and Stumpage Compensation (*Ganti Rugi Nilai Tegakan*, GNRT), a requirement that trees felled illegally by timber concessionaires will be burdened with royalties ten times higher than normal regulated levels.

The prevalence of illegal logging in Indonesia and elsewhere has led to deforestation and forest degradation and caused considerable losses. To address this, the government of Indonesia has undertaken hundreds of anti-illegal logging operations in the current century. In 2001, Indonesia hosted an East Asia regional ministerial-level meeting to agree on measures to eradicate illegal logging, which resulted in the Bali Declaration on Forest Law Enforcement and Governance (FLEG).

The Government has taken a number of far-reaching measures to minimize unsustainable or 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. Details regarding SVLK may be seen in the SIPUHH-online system. Indonesia is in the process of establishing 600 Forest Management Units (KPH). There is an internet-based system to facilitate improvements in non-tax revenue collection (SIMPONI).

In order to increase the economic value of production forests, a paradigm shift is underway from timber management to forest lands management. This transformation is resulting in a 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.

7. Concluding Note

There have been major shifts taken place in the country toward a new perspective of sustainability, through integration of two large portfolios, forestry and environment. This have been contributed to a global cooperation in addressing climate change issues, commitment to managing the production forest sustainability, improving the welfare of the community, and to ensure the availability of land for communities.

Bornean Orangutan Rehabilitation Center at Camp Leaky is the main attraction of Tanjung Puting National Park. Before arriving at Camp Leaky, visitor will enjoy river cruise at Sekonyer River, starting from Kumai port. From *kelotok* (wooden boat), visitor can enjoy Kalimantan wildlife which enliven the river border atmosphere

LOCATION
Sekonyer River - Camp Leaky, Tanjung Puting National Park, Central Kalimantan Province

PHOTO BY
Tanjung Puting National Park

CHAPTER 1

Introduction

This publication was written by Ministry of Environment and Forestry (*Kementerian Lingkungan Hidup dan Kehutanan*), Republic of Indonesia. The goal of this publication is to provide information to the global community regarding the state of Indonesia's forests and forest resources, and regarding the efforts of the Indonesian Government to democratize the allocation of forest resources; to prevent and manage deforestation and the degradation of forest resources; and to ensure environmental justice and equality of opportunity for all members of Indonesia's communities, including *Adat* communities.

For the period from 2015 to 2019, the Indonesian Government has expressed a strong commitment in achieving the democratization of the management and utilization of forest resources. It has intensified its commitment and implementation to preventing deforestation and the degradation of forest sources; developed a system for the certification of the sustainable management of forests; and established a system to resolve conflicts related to forest tenure involving communities, including *Adat* communities through the development of a Social Forestry program. These initiatives have received the full support of both the Indonesian President and the broader community.

The Indonesian Government has formulated a wide range of policies intended to facilitate the effective management of peat ecosystems that are located within Industrial

Over The Rainbow

This is Tumpak Sewu Waterfall, one of many famous waterfalls in Indonesia. The waterfall lies in the forest.

LOCATION
Lumajang, East Java, Indonesia

PHOTO BY
Reksa Manggala
1st winner of Asia Pacific Rainforest Summit 2018 Photo Competition

Plantation Forests and large agricultural (especially oil palm) plantations. New policies to manage these peat ecosystems are intended to better prevent fires both on these peatlands and on 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. Measures to prevent peat fires will have a significant impact in terms of reducing deforestation and forest and land degradation in Indonesia.

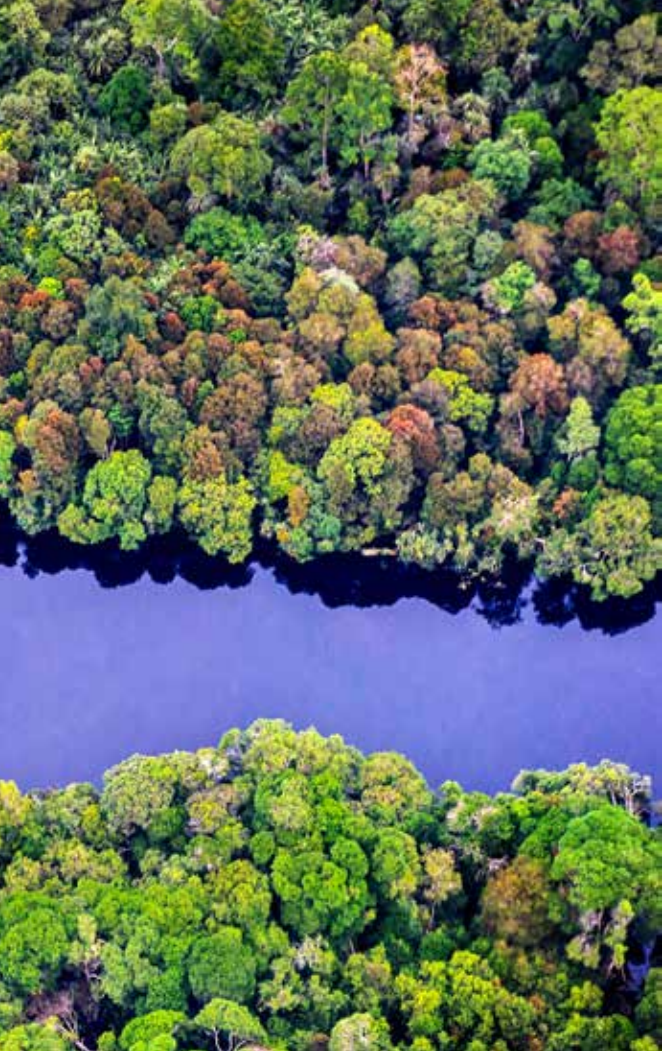
These efforts to prevent and manage forest and land fires are serious commitments from the government to protect the nation's forests from any disturbance, especially fires, by engaging stakeholders' collaboration. A reflection of Indonesia's national and international commitments, these preventative 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 has provided support for the establishment of community-based organizations such as the Community Fire Awareness (*Masyarakat Peduli Api*) groups. The Ministry of Environment and Forestry's work 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 in 2017, with a corresponding reduction in the area of land affected by fires. 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 Indonesian Government has committed and implemented agendas on reducing climate change impacts and ensuring that average global temperatures increase by no more than 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 measures have been implemented 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 natural Forest Areas; and the implementation of a moratorium on the "release" (permanent removal from the Forest Area) of Forest Areas 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 strong political commitment to controlling climate change at the global and national levels.



Peat Swamp Forest

The peat water in the river is reflecting sunlight in dark purple color.

LOCATION
Riau Province, Indonesia

PHOTO BY
Febrianto Budi Anggoro

2nd winner of Asia Pacific Rainforest Summit 2018 Photo Competition

Since 2015, the Indonesian Government has intensified its commitment to resolve tenurial conflicts related to forest land. It has achieved this through a shift from a corporate-oriented to a more community-oriented approach intended to improve community-level economic development by ensuring more equitable access to land and forest resources, and thus promoting 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 the conduct of programs that facilitate the use of resources in Forest Areas following the principles of social forestry. One of the main concerns of the TORA Program is the aspect of economic justice, through (1) ease of access to land, (2) business opportunities for communities, and (3) improvement of rural human resources through vocational training, and increased experience with business and the private sector.

By 2019, the total area of land from the non-Forest Area that is designated for agrarian reform (TORA) will reach 4.8 million hectares, spread across 26 provinces. Meanwhile, a total of Forest Area to be utilized for social forestry programs that will reach 12.7 million hectares, at the whole of Indonesia. 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 in these areas 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; business opportunities and vocational training.

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 the new prospective aiming to ensure that forest resources are utilized to meet the basic needs of the community, rather than to benefit large corporations.

This book consists of seven chapters, the first and second of which present a description and analysis of Indonesia's Forest Areas, including its peat ecosystem, production forests areas, and conservation areas. Chapter 3 describes the efforts to control and reduce deforestation, including through measures to reduce forest fires, to restore the peat ecosystem, and to control climate change. Chapter 4 describes Indonesia's efforts to intensify its social forestry initiatives. Chapter 5 outlines new directions and trends in the management of conservation areas. Chapter 6 addresses issues related to the forestry sector's contribution to the national economy and the current state of the private sector, with a particular focus on the development of systems to establish a chain of custody to ensure that timber is derived from legal sources and to certify the quality of environmental management. The last chapter is a concluding note.

Lesser Bird-of-paradise (*Paradisaea minor*)

LOCATION
Papua

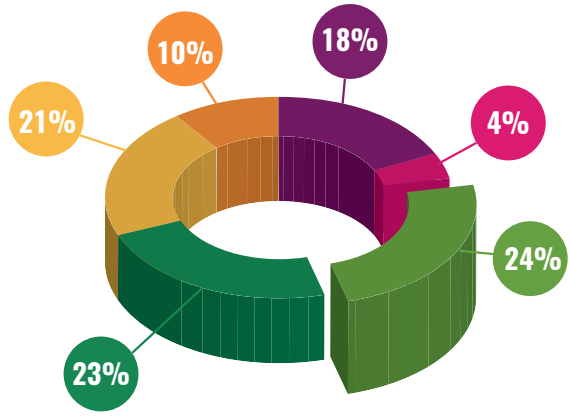
PHOTO BY
Papua Natural Resource Conservation Regional Office (BBKSDA Papua)

CHAPTER 2

An Overview of Indonesia's Forest Area

2.1 Forest Land Status

Indonesia is the world's largest archipelagic nation, with 120.6 million hectares of land, or 63 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 APL[2]). 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 protected 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 2017, the total of these areas stood at 125.9 million hectares (see Figure 2.1).



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, 2017a, Data up to December 2017

▶ **FIGURE 2.1** Percentages of 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 from total area of all provinces in Indonesia (sumber: www.bps.co.id) substracted by 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[3] (*Hutan Produksi*, HP, 68.8 million hectares), protection forest[4] (*Hutan Lindung*, HL, 29.7 million hectares), and conservation forest[5] (*Hutan Konservasi*, HK, 22.1 million hectares). Production forest area consists of Permanent Production Forest[6] (*Hutan Produksi Tetap*, HP), Limited Production Forest[7] (*Hutan Produksi Terbatas*, HPT), and Convertible Production Forest[8] (*Hutan Produksi yang Dapat Dikonversi*, HPK). The conservation forest area is categorized into Sanctuary Reserve Areas (*Kawasan Suaka Alam*, KSA[9]) and Nature Conservation Areas (*Kawasan Pelestarian Alam*, KPA[10]). KSA consist of Strict Nature Reserves[11] (*Cagar Alam*, CA) and Wildlife Sanctuaries[12] (*Suaka Margasatwa*, SM). Meanwhile, KPA consist of National Parks[13] (*Taman Nasional*, TN), Nature Recreation Parks[14] (*Taman Wisata Alam*, TWA), and Grand Forest Parks[15] (*Taman Hutan Raya*, Tahura). KSA/KPA can be terrestrial or marine. All types of KSA/KPA with 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 hectares[16]. One of the more famous conservation areas 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 the Bunaken Marine National Park, the Wakatobi National Marine Park, and the Raja Ampat Marine Protected Area.

Indonesia employs a different definition of "forest" than those sometimes used elsewhere in 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 Degradation[17] (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"

[3] Production forest is a Forest Area whose main functions is to produce forest products.

[4] Protection forest is a Forest Area whose main function is to protect a life buffer system in order that the water system may be regulated, flood prevented, erosion put under control, sea water instrusion prevented and soil fertility maintained.

[5] Conservation forest is a Forest Area with a particular characteristic and with the main function of conserving the diversity of plants and animals and their ecosystem.

[6] Permanent Production Forest is a Forest Area with specific characteristics including sloped land, soil type and precipitation intensity which when factored together have a total value of less than 125. The areas are located outside protected areas, sanctuary reserve forest, natural conservation forest and hunting parks.

[7] Limited Production Forest is a Forest Area with specific characteristics including sloped land, soil type and precipitation intensity which when factored together have a total value of 125-174. The areas are located outside protected areas, sanctuary reserve forest, natural conservation forest and hunting parks.

[8] Convertible Production Forest is a Forest Area that can be converted to uses other than forestry.

[9] KSA/Sanctuary Reserve Area is a specific terrestrial or marine area having sanctuary as its main function preserving bio diversity plant and animal as well as an ecosystem which also acts as a life support system.

[10] KPA/Nature Conservation Area is a specific terrestrial or marine area whose main function is to preserve diversity of plant and animal species, as well as to provide a sustainable utilization of living resources and their ecosystems.

[11] Strict Nature Reserve is a sanctuary reserve area having a characteristic set of plants, animals and ecosystems, which must be protected and allowed to develop naturally.

[12] Wildlife Sanctuary is a sanctuary reserve area having a high value of species diversity and/or a unique animal species, in which habitat management may be conducted, in order to assure their continue and existence.

[13] National Parks is a nature conservation area which posesses native ecosystems, and whih is managed through a zoning system utilized which facilitates research, sciences, education, breeding enhancement, recreation and tourism purposes.

[14] Nature Recreation Park is a nature conservation area mainly intended for recreation and tourism purposes.

[15] Grand Forest Park is a 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.

[16] See Chapter 5 for more detail information on conservation areas.

[17] MoEF, 2016.

(*berhutan*) and not covered by forest or "not forested" (*tidak berhutan*). Similarly, public lands that are categorized under Indonesian law as "Areas for Other Uses" (*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 forest, plantation forest, plantation/estate crops, agriculture, shrub, settlements, and various others. There are 23 land cover classes in Indonesia (see Appendix 1) and so far, these have been used for assessing the forest and forest resource monitoring. Based on a reassessment of land cover conducted in 2017 using image interpretations derived from the Landsat Data Continuity Mission (LDCM)/Landsat 8 OLI for 2017 coverage, 78.5 percent of Indonesia's conservation forest area; 80.6 percent of its protection forest area; and 79.4 percent of its limited production forest area are covered by natural forest. Natural forest consists primary and secondary forests. In permanent production forest areas, natural forest covers 58.3 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 regreening activities within and outside the Forest Area. The remaining land cover types found in all these forest areas are estate crops, agriculture, shrub, settlements, etc. which are classified as non-forest. Table 2.1 quantifies forest cover in and outside the Forest Area.

A view of Mount Pangrango

LOCATION
Gunung Gede Pangrango National Park, West Java

PHOTO BY
Gunung Gede Pangrango National Park

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 describes non-forested types of vegetation. 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 2018 adheres to this same "working definition" of a forest. ■

SOURCE: [MoEF]. 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.

▶ **TABLE 2.1** Extent of land cover types in forest area and non-forest area in Indonesia (2017)

Land cover	Forest area* (in million hectare)							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)[a]
A. Forested	17.3	23.9	21.3	17.0	79.6	6.3	85.8	8.1	93.9	50.0
- Primary forest	12.5	15.2	9.7	4.7	42.2	2.5	44.7	1.5	46.1	24.6
- Secondary forest	4.7	8.4	11.3	9.7	34.0	3.8	37.8	5.4	43.1	23.0
- Plantation forest[b]	0.1	0.3	0.3	2.7	3.4	0.0[c]	3.4	1.3	4.7	2.5
B. Non-forested	4.8	5.8	5.5	12.2	28.2	6.5	34.7	59.3	94	50.0
Total Terrestrial Area	22.1[d]	29.7	26.8	29.2	107.8	12.8	120.6	67.4	188	100
% Forested Area[e]	**78.5**	**80.6**	**79.4**	**58.3**	**73.8**	**49.1**	**71.2**	**12.0**	**50.0**	

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 and see Box 2.1.
[a] Percentage is calculated by dividing each row in the Grand Total (column 9) with the Total Terrestrial Area in the column (188 million hectares).
[b] Plantation forest based on image interpretation is forest cover class which was developed by human, includes all types of planted forests, both the industrial plantation forest/IUPHHK-HT and planted forest from reforestation/regreening within or outside forest areas; identified in the image as having neat pattern on flat areas, or showing different color image to the surrounding environment on non-flat/wavy topographic areas.
[c] The actual figure is 29.3 thousand hectares.
[d] This figure refers to total terrestrial (land) area of the terrestrial KSA/KPA (KSA/KPA *darat*) area.
[e] Percentage is calculated by dividing each row in the column with the Total Terrestrial Area of the same column.

SOURCE: DJPKTL, 2018

2.2 Biodiversity potential

Indonesia is a tropical climate 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 trans-sected 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 biodiversity[18] and endemism. Indonesia's biodiversity is greater than any other country in the world except Brazil and Colombia.[19] 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.[20]

[18] Biodiversity can be grouped into three main types: ecosystems, species, and genetic diversity.
[19] Butler, 2016.
[20] Kartawinata (2013) in IBSAP 2015-2020.

Proboscis monkey (*Nasalis larvatus*)

LOCATION
South Kalimantan Province

PHOTO BY
South Kalimantan Natural Resource Conservation Office (BKSDA Kalsel)

According to 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.[21]

Indonesia's animal 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*), the midget buffalo (*Bubalus quarlesi*) in Sulawesi, the Komodo dragon (*Varanus komodoensis*) in West 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.

[21] IBSAP 2015-2020 (KemenPPN/BAPPENAS, 2016).

2.3 Forestry and the Management of Forests in Indonesia

Indonesia's development vision for 2015-2019 reiterates Indonesia's longstanding status as a sovereign, independent and principled nation based on mutual cooperation. To reinforce this status, nine priority agendas are outlined for national development, which are known as NAWACITA[22] (see Appendix 2). The Ministry of Environment and Forestry (MoEF) is directly involved in at least three of these agendas, as follows:

- *Agenda One*: Strengthen Indonesia's commitment to reforming its law enforcement and other systems to ensure that they are free of corruption, trustworthy, and in keeping with the dignity of the nation.
- *Agenda Six*: Increase the nation's productivity at the community level and increasing its ability to compete in international markets.
- *Agenda Seven*: Achieve economic autonomy by stimulating strategic sectors in the domestic economy.

There are also nine sub-agendas assigned to the Ministry of Environment and Forestry (see Appendix 3), with these nine boiling down to three strategic targets:

(1) Maintaining the quality of the living environment to support the natural environment carrying capacity, water quality, and public health;
(2) Utilizing forest resources and environment sustainably to improve the economic and social welfare of communities in a just manner;
(3) Maintaining the equilibrium of ecosystems, biodiversity, and natural resources as a life support system to support sustainable development.

These national agendas and their associated sub-agendas provide the Ministry of Environment and Forestry with a mandate for the achievement of targets directly related to the management and preservation of forests and forest resources, through six main programs, which are described in sections 2.3.1 to 2.3.6 below.

2.3.1 Governance of forest areas

Various efforts have been made by the Government of Indonesia to prevent degradation and maintain forest cover, one of which is to support the target of the United Nation Strategic Plan on Forests (UNSPF) to reach 30 percent world forest cover by 2030 and undertake Voluntary National Contribution (VNC) in Indonesia in support of the UNSPF.

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; the unsustainable management of the 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 critical 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:

[22] Nawacita is a term that is derived from Sanskrit, from the words nawa (nine) and cita (hope, agenda, desire). The term is used to refer to the nine priority development agendas formed by the Working Cabinet (2015-2019) Republic of Indonesia.

(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 it 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.
(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 implementating 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 (El Nino) and landslides and floods (La 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.[23]

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 Government of Indonesia demonstrated its commitment to international agreements on climate change when it ratified the Paris Agreement, and then incorporated it into the Act No. 16 of 2016 on the Ratification of the Paris Agreement to the United Nations Framework Convention on Climate Change. The commitment to reducing emissions from greenhouse gases has been reaffirmed in Indonesia's Nationally Determined Contribution (NDC), whereby Indonesia's agreed 2030 targets for reducing emissions 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 and transportation, waste, industrial, and agriculture sectors.

Improvements in the effectiveness of climate change mitigation and adaptation measures are being sought. The role of a National Focal Point (NFP) will become more prominent. Reductions in the area of forest areas and land affected by fire and an increase in the number of areas with the capacities to implement adaptation measures are being targeted. Strategic issues include 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 newest NDC, the strategy of achieving a reduction of greenhouse gas emissions of between 29 percent and 41 percent, will be achieved through emissions reductions in the land/forest sector of between 17 percent and 23 percent, and in the energy sector of between 11 percent and 14 percent. In previous NDC documents, the land/forestry sectors' contribution was only 8 percent.

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 total, spread across the islands of Sumatra, Kalimantan, Sulawesi 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 : 5.5 million hectares[24]. Indonesia's entire Peat Hydrological Unit (*Kesatuan Hidrologis Gambut*, KHG) covers a total area of 24.14 million hectares, of which 9.16 million hectares are located in Sumatra; 8.39 million hectares in Kalimantan; 6.53 million hectares in Papua; and 60,000 hectares in Sulawesi.

[23] DJPPI, 2015.

[24] Miles, et al., 2017.

Peat ecosystems[25] 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 reducing the level of greenhouse gas emissions into 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 additional Regulations of the Minister of Environment and Forestry, contain procedures for inventorying peat ecosystem functions, measuring of groundwater levels, guiding restoration of peat ecosystems, and adjusting the trajectory of development of Industrial Plantation Forests and oil palm plantations in Indonesia toward better management of peat in Indonesia. The government regulations reinforce protective measures for peat ecosystems and restricts anyone, including communities and companies, from opening new peat-lands 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 in the ground.

Among the four follow-up regulations of the Minister of Environment and Forestry, Regulation P.40 /MENLHK/SETJEN / KUM.1/6/2017 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 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 renewal of the forest moratorium and law enforcement. One peat protection effort that involves grassroots communities is the "Peat Concern Village" 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

[25] 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.

equitable access to these resources through the full involvement of all elements of the community, thus 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.

In accordance with the RPJMN 2015-2019, the Government has allocated 12.7 million hectares of forest land to the community 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.[26] 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.

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 the maintenance of 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 protective 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

[26] DJPSKL, 2015.

Indonesia. Best practices in biodiversity conservation include protecting animal habitats and wildlife coridors. New species have recently been found in protection and conservation forest including the Orangutan Tapanuli (*Pongo tapanuliensis*) 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.

Strategic issues relate to: the management of protection and conservation areas; the protection of life-support systems; the preservation of germplasm resources; and the sustainable use of natural resources and ecosystems.

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 year 1967 forests have had an important role in terms of the production 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 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 2013, critical lands nationwide (not including Jakarta) were recorded at 24.3 million hectares, including 15.5 million hectares of degraded lands *inside* the Forest Area. The implementation of regional autonomy gave authority to district government to grant permits for the poorly-managed felling of timber within the Forest Area (an authority which has since been rescinded), and the conversion of parts of the Forest Area into crop estates (an authority which still rests with district governments). All of this has been 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.

In the era of President Joko Widodo-Jusuf Kalla, 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 (2014-2015), geothermal power (2015), 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.[27] 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 improvements to information transparency (*Sistem Infromasi Penerimaan Negara Bukan Pajak Online*, SIMPONI).

In 2017 alone, investment in the environment and forestry sector reached IDR 148.8 trillion or USD 11 billion, with a new employment uptake of 738,000 people, an increase of 49.7 percent compared to 2016, when only 493,000 new forest jobs were created. This would appear to demonstrate improvements in the forest investment climate in Indonesia, as well as in the forest-related regulatory climate, and in the ease of forest businesses in their interactions with Ministry officials.

As for the social forestry program, this endeavors to provide easy access to forest management for local communities, which as of June 2018 had reached a nationwide total of 1.72 million hectares of various forms of community forests, of which 74 percent were established between 2015 and 2018. Social forestry practitioners were among the recipients of community business credits (*Kredit Usaha Rakyat*) whose allocation in 2017 was in IDR 95.5 trillion or 7 USD billion. 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. A study carried out in Kalibiru, which is located in the special province of Yogyakarta, new social forestry programs were found to have contributed 6.3 percent to the farmer incomes. ■

[27] DJPHPL, 2015.

My Forest, My Karimunjawa

LOCATION
Karimunjawa National Park,
Central Java Province

PHOTO BY
Hary Susanto

CHAPTER 3

Addressing the Causes of Deforestation and Forest Degradation

3.1 Causes of Deforestation and Forest Degradation

Deforestation and forest degradation has been of major concern to many developing countries, including Indonesia. Sometimes desired, but mostly undesired, deforestation carries both positive and negative impacts[28]. 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 1982[29]. 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 the human well being. Vast amounts of research have been undertaken to identify the causes of deforestation and

View of natural forest with logging road and logs at PT Mitra Pembangunan Global concession, Maybrat District, West Papua Province.

LOCATION
Maybrat District, West Papua Province

PHOTO BY
Maman Permana

[28] Contreras-Hermosilia, 2000.

[29] Siscawati, 1998; Sunderlin and Resosudarmo, 1996.

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

The Government of Indonesia has been publishing deforestation figures from 2006, and currently publishes them annually[30]. Some of the activities identified as the 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 for these activities as the causes of deforestation in Indonesia have been researched and discussed by various scientists and researchers[31]. These researchers have even differentiated between direct, immediate, proximate and primary causes vs. indirect, underlying, and secondary causes of deforestation and forest degradation. Yet other causes include infrastructure development, demand for timber exports, population growth and density, urbanization and urban expansion, commodity prices (for timber, oil palm, coal,

[30] Baplan, 2008; Ditjenplan, 2011, 2012, 2013, 2014, 2015; DJPKTL, 2017a, 2017b.

[31] 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.

bauxite, and nickel), Indonesia's geographic accessibility to markets, poverty, land tenure security and conflict, and wages and off-farm employment.

While many of the pheonomena 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 of Indonesian 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 the 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 2011[32], provision of land for communities, resolving land use conflicts, and monitoring environmental permits and law enforcement (see Section 3.4). Indonesia also has committed to reducing greenhouse gas emissions and encouraging collaboration between communities, concession holders (IUPHHK) and Forest Management Units (FMU) to prevent forest and land fires through the establishment of fire brigades (see Sections 3.5 and 3.6), 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 certifications (see Chapter 6).

3.2 Monitoring Forest Resources

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 4 TM, Landsat 5 TM, Landsat 7 ETM +, Landsat 8 OLI) and high-resolution satellite images (SPOT-6, SPOT-7). The land cover map derived from this process in 2017 is presented in Figure 3.1.

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 Forest Resource Balance (*Neraca Sumber Daya Hutan*, NSDH), a Critical Land Map (*Peta Lahan Kritis*), an Indicative Map on the Suspension of the Issuance of New Permits (*Peta Indikatif Penundaan 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

[32] 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 for two years and renewed continuously up to present.

Sumatran Tiger (*Panthera tigris sumatrae*)

PHOTO BY
Directorate General of Natural Resources and Ecosystem Conservation, Ministry of Environment and Forestry (DJKSDAE)

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 Forest Reference Emission Level (FREL), and other products.

For each period, the process identifies increases or decreases to the level of deforestation. For the purposes of this paper the term deforestation refers to net deforestation (See Box 3.1).[33] The extent of net deforestation can be calculated by determining the extent of gross deforestation[34] subtracted by reforested areas.[35] This can be expressed by the following equation:

Extent of Net Deforestation = Extent of Gross Deforestation - Extent of Reforestation.

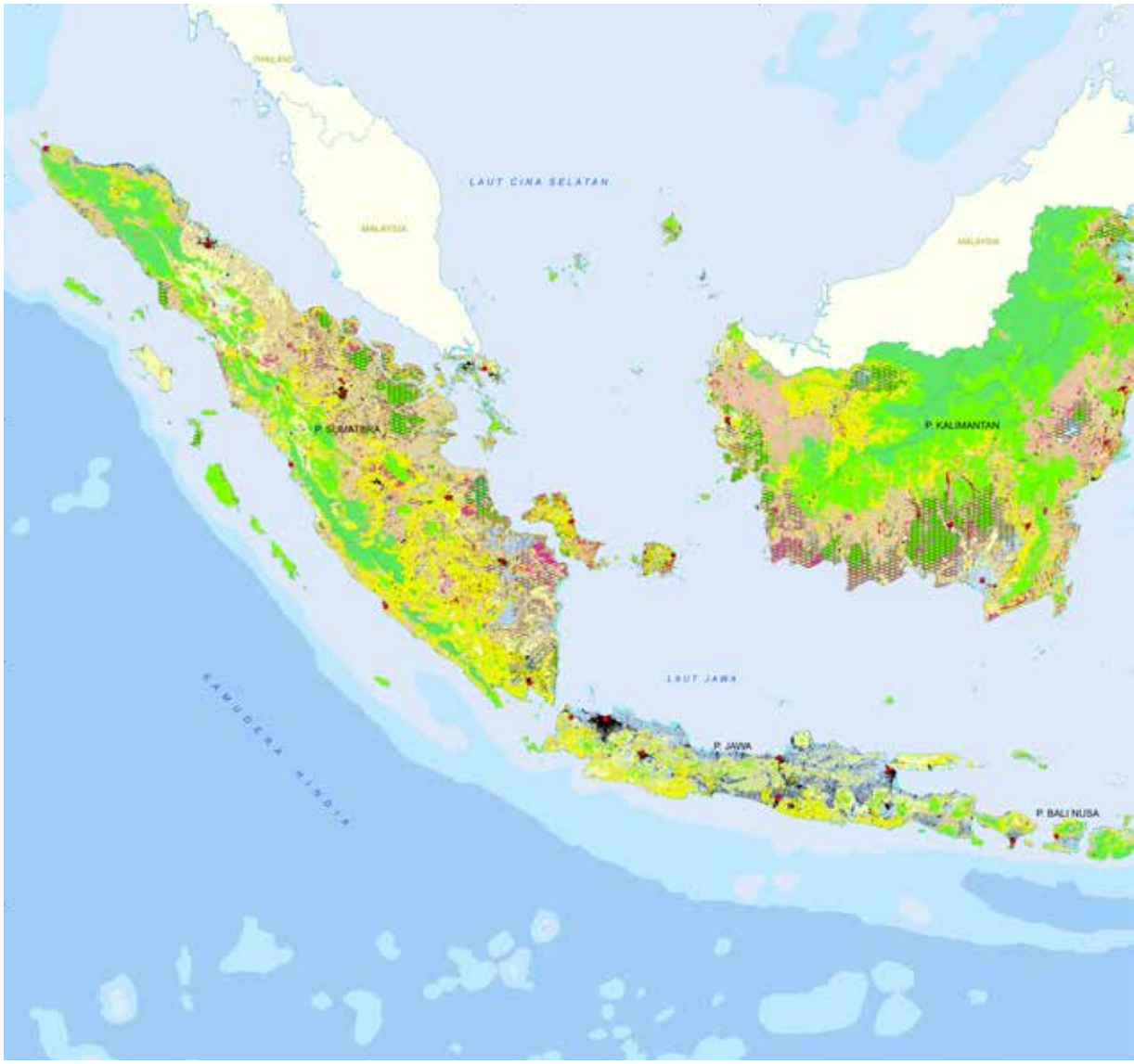
An increase in deforestation may result from dynamic changes to land cover as a result of human activities in utilizing land that cause the loss of forest cover, while a decrease of deforestation may result from reforestation activities. Meanwhile, additions to the extent of forest cover may result from planting activities in plantation forest concession areas and/or from regreening and reforestation activities[36] as well as natural regrowth.

[33] Net deforestation refers to the change/reduction forested land cover over a period of time.

[34] Gross deforestation refers to the change of land cover from forested to non-forested.

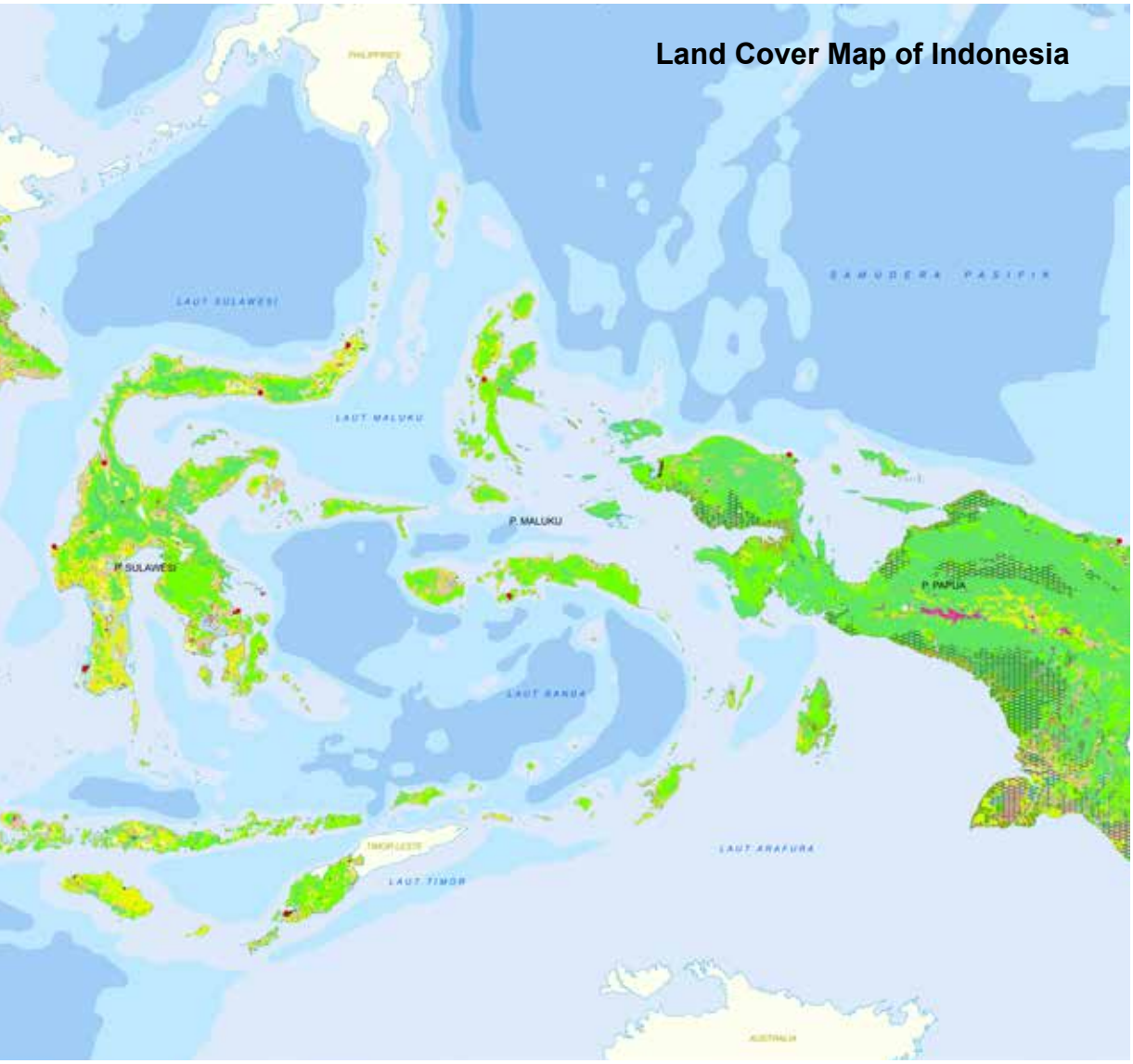
[35] Reforestation is forest and land rehabilitation in which the activity is carried out inside a forest area.

[36] DJPKTL, 2018.



▶ **FIGURE 3.1** Indonesia Land Cover Map, 2017

Land Cover Map of Indonesia



- Open Area
- Mining
- Airport/Seaport
- Settlement
- Water Body
- Swamp

MAP SOURCES

1. Landsat Image 8 OLI/TIRS July 2016 - June 2017
2. Topographic Map of Indonesia, Scale 1:250,000, Geospatial Information Agency, 2017
3. Administrative Boundary Map, Scale 1:250,000, Geospatial Information Agency, 2017

MINISTER OF ENVIRONMENT AND FORESTRY OF THE REPUBLIC OF INDONESIA,

Signed

SITI NURBAYA

MINISTRY OF ENVIRONMENT AND FORESTRY
2018

Box 3.1

Deforestation

Deforestation is the conversion of forest to another land use or the long-term reduction of tree canopy cover below the 10 percent threshold (FAO, 2000). The FAO's use of "long-term" is debatable, and a complicated fact 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 other land cover categories was selected for the sake of practicality, simplicity and clarity on the land cover class identification and classification processes. The term was introduced in a 2008 Indonesia Forest Climate Alliance (IFCA) document, and the common sense of this definition is permanent "gross deforestation".

"Gross deforestation" counts only what has been lost (natural forest cleared) and does not 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: [MoEF]. 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.

In 2002, Indonesia and Malaysia are the most important countries, have dominated the world CPO market and contributed to approximately 80 percent of palm oil trade. The development of palm oil plantations has been complicated and attracting many people's concern, where the oil palm sector is one of important drivers of deforestation in Indonesia. According to some reports, oil palm produces 4 to 10 times more oil per hectare than any other oil crop[37]. The palm oil sector makes a significant contribution to the Indonesian economy. The production of palm oil in Indonesia reached 32.2 million tons or 58 percent of world production in the year 2016[38]. The increase of international demand for palm oil gives means that more land is needed for oil palm trees. The war of opinion was such turbulence over the position of Indonesia oil palm, including on the oil palm governance issues, which was being improved by the government. 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 forested landuse, is a result of a series of sustainable effort including moratorium of new licenses of forest concession in primary forests and peatland (PIPPIB), including for palm oil plantation.

The decision of the European Union on 14 June 2018 to further supports the market mechanism, to keep importing palm oil up to 2030, will have implications for the increasing demands of imported palm oil from Indonesia, thus increasing the production of palm oil. The Government of Indonesia is very cautious in responding to the EU's decision, and the Ministry of Environment and Forestry is more prudent by paying more attention to the efforts of "forest governance perspective on sustainable palm oil", as a consistent government policy to carry out its corrective and operational policies on palm oil issues.

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 number of efforts need to be done for better implementation of ISPO standard in the field to go toward delivering 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 regulation[39] on peatland ecosystem management and protection, which is an important follow-on to an earlier government moratorium on peatland exploitation. Also, during the last 2 to 3 years the government has started discussing within the country about the possibility of producing a presidential instruction for a complete oil palm plantation moratorium both on and off peatlands, for better intensive management and environment protection, and the draft of a decree is currently undergoing discussion between industry, environmentalists, scientists and parliament members.

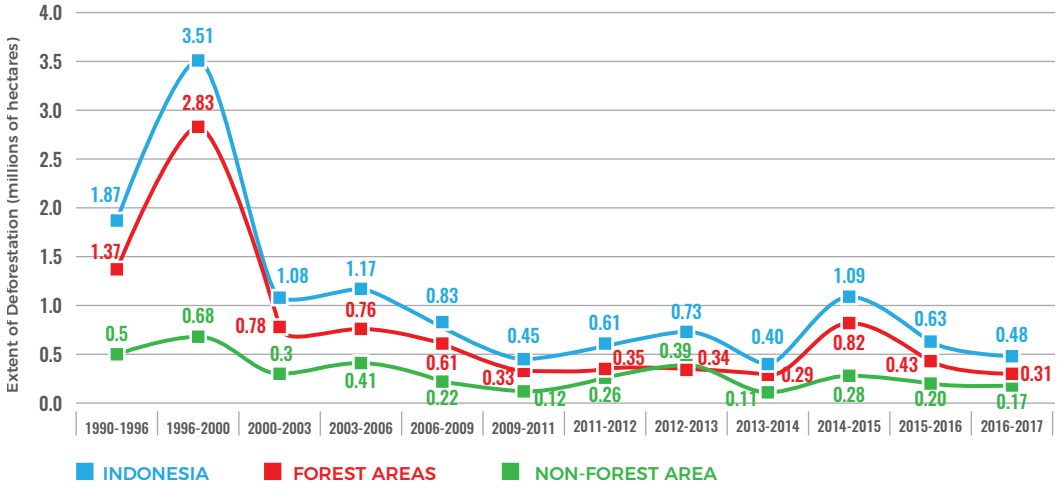
Indonesia has calculated levels of deforestation periodically since 1990 (see Figure 3.2). The highest levels of deforestation rates were recorded in the period from 1996

[37] http://www.environmenttimes.co.uk/news/item/661-disagreement-over-iceland-s-methods-of-tackling-palm-oil-s-biodiversity-impact

[38] ISTA Mielke GmbH, OIL WORLD, and Hamburg-1 (2017).

[39] 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.

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. In 2014 to 2015, annual deforestation within the Forest Area was 0.82 million hectares. Amongst the major drivers were the forest fires of 2015.



SOURCE: KLHK, 2018a

▶ **FIGURE 3.2** Indonesian Deforestation Trends, 1990-2017

In the subsequent period, the rate of deforestation again declined. In 2015 to 2016 the deforestation was 0.63 million hectares. In 2016 to 2017, the process of calculating deforestation was based on image interpretation derived from LDCM (Landsat Data Continuity Mission) 8 OLI and forest area data for 2017. This process shows that over that year, the extent of deforestation stood at 0.48 million hectares. The extent of deforestation in the Forest Area stood at 0.31 million hectares (61.9 percent of the total), a decline from the figure of 0.43 million hectares recorded in 2015-2016. By contrast, the extent of deforestation in the public land (non-forest areas) designated for other purposes (APL) stood at 0.17 million hectares (38.1 percent of the total). The most significant deforestation occurred in secondary forests both in and outside of the Forest Area, with the figure standing at 0.45 million hectares. A breakdown of the extent of (net) deforestation based on forest types in 2016 to 2017 is presented in Table 3.1.

▶ **TABLE 3.1** Breakdown of Indonesia's Net Deforestation (2016-2017)

Forest type	Net deforestation (in million of hectares)								
	Forest Area							APL	GRAND TOTAL
	Permanent Forest Area					HPK	Total		
	HK	HL	HPT	HP	Total				
A. Primary forest	0.01	0.01	0.00	0.00	0.03	0.00	0.03	0.01	0.04
B. Secondary forest	0.03	0.05	0.08	0.09	0.24	0.04	0.28	0.17	0.45
C. Plantation forest*	0.00	0.00	0.00	-0.01	-0.01	0.00	-0.01	0.00	-0.01
Total	**0.04**	**0.06**	**0.08**	**0.08**	**0.26**	**0.04**	**0.30**	**0.18**	**0.48**

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

SOURCE: KLHK, 2018b

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 a legal basis for the policy being established as part of a Law concerning Geospatial Information.[40] 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.

The One Map will enable Indonesia as a nation to move several large strides closer 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 Plantation Forests, 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 Policy[41], with these regulations intended to facilitate the resolution of conflicts related to land use and the accurate identification of borders between regions throughout Indonesia. A target has been established for

[40] Undang-Undang Republik Indonesia No. 4 Tahun 2014 tentang Penetapan Peraturan Pemerintah Pengganti Undang-Undang Nomor 1 Tahun 2013 Tentang Perubahan Kedua Atas Undang-Undang Nomor 24 Tahun 2003 Tentang Mahkamah Konstitusi Menjadi Undang-Undang.

[41] Peraturan Presiden Republik Indonesia No. 9 Tahun 2016 tentang Percepatan Pelaksanaan Kebijakan Satu Peta.

the achievement of 85 specific 'themes' (that is to say, categories of geospatial phenomena, ranging from provincial and district/city borders, to categories of land use, to roads, to rivers, to resource exploitation concessions) by 2019. Responsibility for these 85 themes is divided between 19 ministries/institutions (*kementerian/lembaga*, or K/L). Of the 85 themes, the Ministry of Environment and Forestry is responsible for nine. The results of this process - up to, but not including the integration phase - will be published in August 2018 through the National Geospatial Information Network. The specific themes for which the Ministry of Environment and Forestry is responsible are summarized in Figure 3.3.

SOURCE: KLHK, 2018c

▶ **FIGURE 3.3** Targets and achievements of the One Map Policy implementation, as of 2017

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 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 produced different accuracy from previously produced maps. A final challenge is that administrative boundaries are not yet complete 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.

In 2018, the implementation of the One Map policy within the Ministry of Environment and Forestry will involve:

- Updating Forest Area Stipulation Maps (the results of boundary marking activities), to a scale of at least 1: 50,000;
- Integrating Forest Concession Areas maps to a scale of at least 1:50,000;
- Updating Community Plantation Forest maps to a scale of at least 1:50,000;
- Updating Special Purposes Forest Area maps to a scale of at least 1:50,000;
- Updating Forest Resources Balance maps to a scale of at least 1:250,000;
- Updating Forest Area Designation maps to a scale of 1:50,000;
- Integrating the Zoning Map of National Parks to a scale of 1: 50,000;
- Integrating *Adat* Forest Maps to a scale of 1:50,000.

The updating of maps to support the implementation of the One Map Policy is scheduled for completion by 2018. In 2019, efforts will be made to synchronize Thematic Geospatial Information (*Informasi Geospasial Tematik*, IGT) between Indonesia's different ministries/institutions.

To fulfil 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 as the baseline 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 can be accessed through a website located at webgis.menlhk.go.id.

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 will 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 126 million hectares. As of June 2017, around 86 million hectares of the Forest Area had their boundaries marked, representing about 85 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 policy 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 been extended three times to date.[42]

To further 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 Permits 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 popularly 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 2017, the 13th revision to this decree was issued.[43]

In revisions I to VI of the decree, the size of the area covered by the moratorium was slightly reduced on the basis of updated spatial data, revisions to designated forest areas, updates on the utilization of forest areas, and revisions based on surveys of peatlands and primary forests. Starting with revision VII, the area covered by the moratorium was increased, partly due to the non-renewal of certain expired forest utilization permits which contained areas covered by primary forest or hydrological peat.

Following the promulgation of revision XIII, the area covered by the moratorium stood at 66.4 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 9.5 million hectares of primary natural forest that are unencumbered with licenses and stand in either in Production Forests or APL. In 2018 and 2019, the decree will be further revised in June and December of each year.

3.4.2 The provision of land for communities and non-forestry sectors

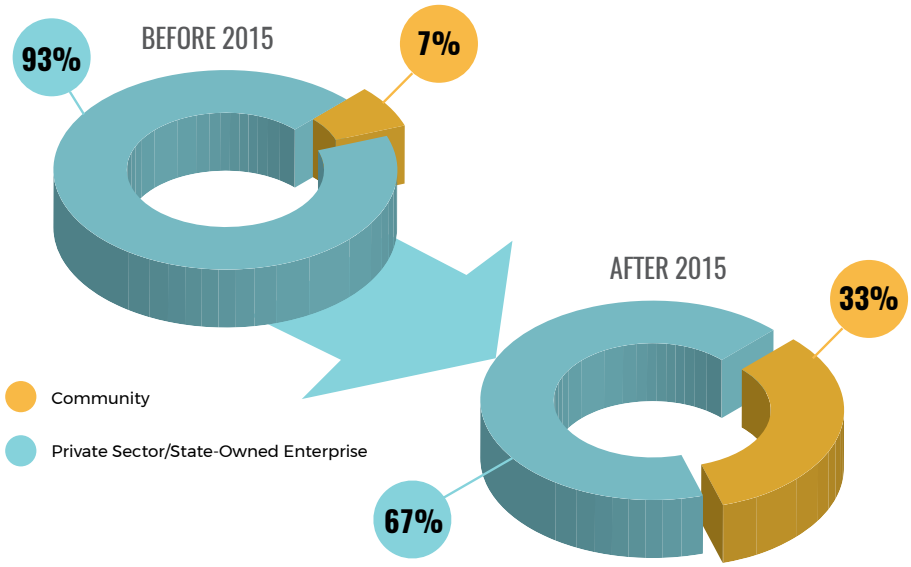
With Indonesia's expanding economy and increasing population, the demand for land is becoming more intense. Means for meeting this demand may include the release of areas from the Forest Area for purposes such as transmigration settlements and agricultural use; a redesignation of the status of areas within the Forest Area; and the increased use of areas within the Forest Area through area exchange programs. 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

[42] 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).

[43] Keputusan Menteri LHK No. SK.6559/MENLHK-PKTL/IPSDH/PLA.1/12/2017 tanggal 4 Desember 2017 tentang Penetapan Peta Indikatif Penundaan Pemberian Izin Baru Pemanfaatan Hutan, Penggunaan Kawasan Hutan dan Perubahan Peruntukan Kawasan Hutan dan Areal Penggunaan Lain (Revisi XIII). Ministerial Decree No. SK.6559 / MENLHK-PKTL / IPSDH / PLA.1 / 12/2017, dated December 4, 2017.

to refer to as 'considerations of equity' a term which appears to ecompass 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 (*Ekonomi Pemerataan*) 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 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.



SOURCE: KLHK, 2018d

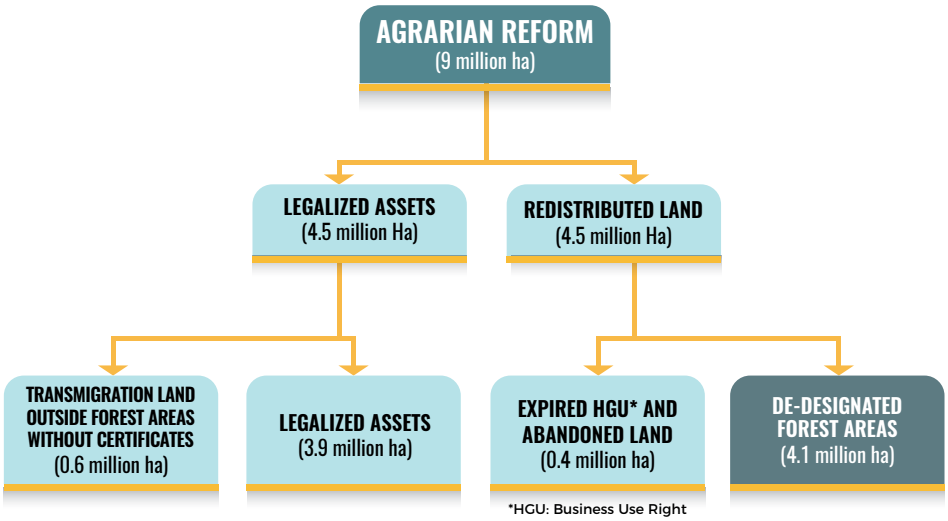
FIGURE 3.4 Utilization of Forest Areas by Communities Prior to 2015 and Targets for the Future

The fifth sub-agenda of the National Development Agenda mandates improvements to the quality of life for the people of Indonesia, with a particular focus on improving the welfare of members of marginal groups. One of the means by which this is to be achieved is through the agrarian reform program (TORA). The objective of this 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.

The Government has identified 9 million hectares of land that can be used to facilitate the agrarian reform program (TORA). This will consist of 4.5 million hectares, 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 the a Ministry of Environment and Forestry Decree which sanctions an "Indicative Map of Forest Areas for the Provision of Land for the Agrarian Reform Program (TORA)".[44] Of 4.1 million hectares of Forest Area that will be allocated for purposes of land reform, Figure 3.6 shows the status of 3.9 million of those hectares, as follows:

- 2.17 million hectares are Convertible Production Forest which is no longer productive
- 0.07 million hectares is to be reserved for the establishment of new rice fields



SOURCE: DJPKTL, 2017

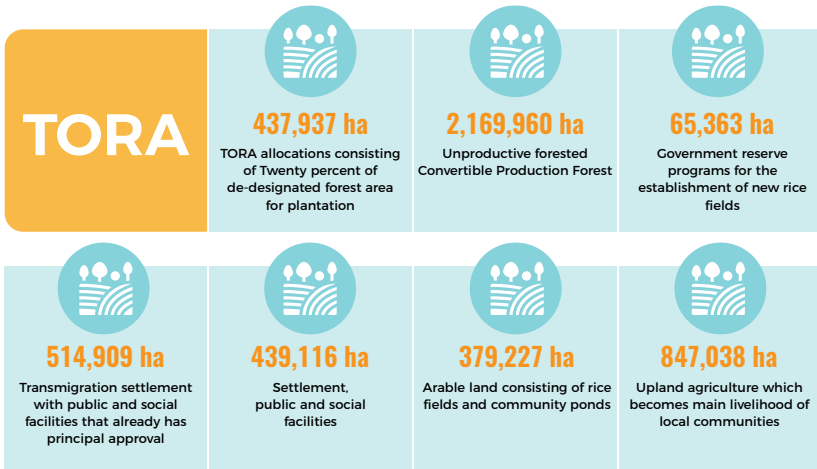
▶ **FIGURE 3.5** Land Allocated for Agrarian Reform.

[44] Keputusan Menteri LHK No. SK. 180/MENLLHK/SETJEN/KUM.1/4/2017 tentang Peta Indikatif Lokasi Kawasan Hutan untuk Penyediaan Sumber Tanah Obyek Reforma Agraria (TORA).

- 0.44 million hectares which is already *fasos fasum*, an Indonesian government acronym which is intended to refer a cluster of houses that are accessable by road, served by sewers and electricity, and with the trappings of a community, such as schools and places of worship
- 0.38 million hectares are already have cultivated rice fields and/or fish ponds
- 0.85 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 0.51 million hectares of transmigration areas that are outside of the Forest Area, which *fasos fasum* already developed, and awaiting final land certificates.

The extent of the areas (in hectares) designated in Figure 3.6 below, taken individually or collectively, more or less match the headline numbers presented in Figure 3.5, give or take no more than one or two hundred thousand hectares for some individual or collective categories.

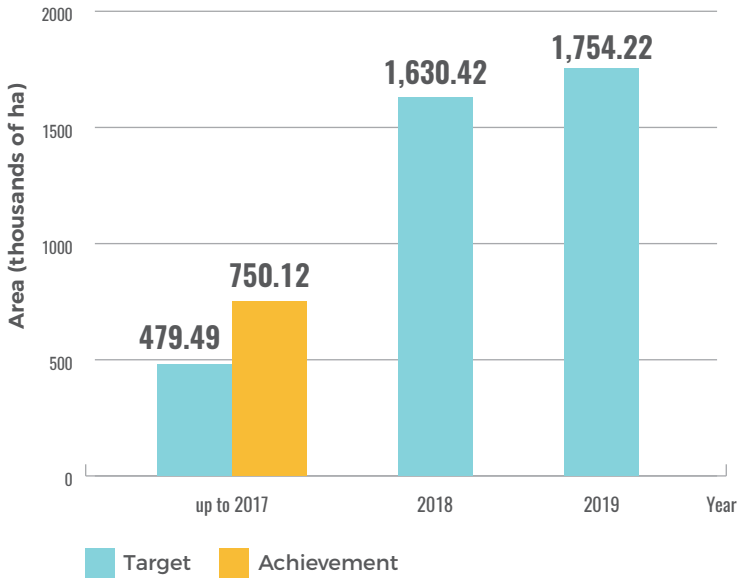


SOURCE: KLHK, 2018e

▶ **FIGURE 3.6** Identification of types of land set aside for the Agrarian Reform (TORA program) and their indicative size

As shown in Figure 3.7 below, by the end of 2017, 750,123 hectares of land had been released from the Forest Area to communities through the TORA program, with a target of another 1,630,421 hectares to be released by the end of 2018 and of 1,754,222 hectares by the end of 2019.

To facilitate the implementation of its social forestry program, the Indonesian Government intends to allocate a total of 12.7 million hectares of state forest 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,[45] the Ministerial Regulation concerning Social Forestry in State-Owned Forestry Enterprise Areas[46] and the Ministerial Regulation concerning Right Forest.[47] In practice, 1.7 million hectares of the 12.7 million hectares has been re-allocated to date.



SOURCE: KLHK, 2018f

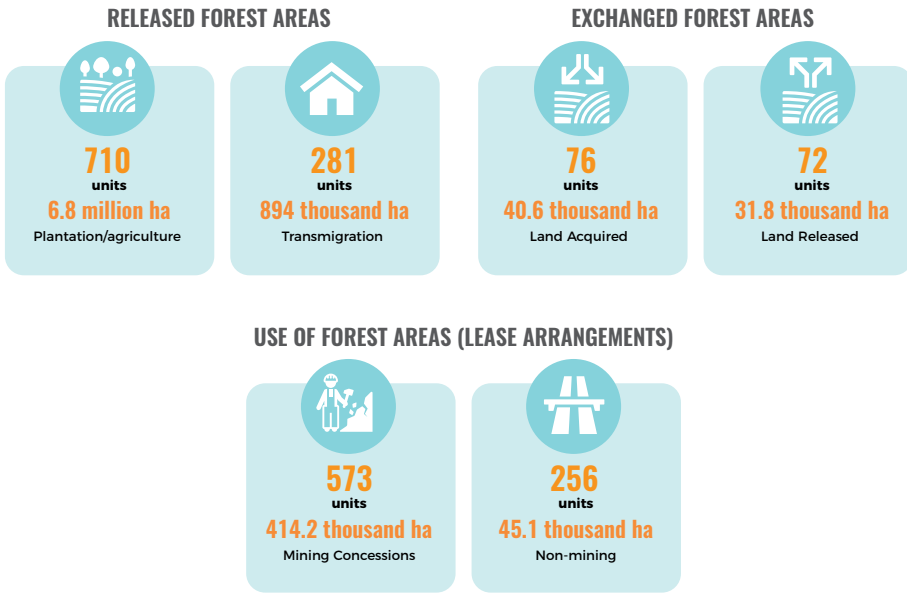
▶ **FIGURE 3.7** Targets and achievements of the TORA program in forest areas.

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

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

[47] Peraturan Menteri LHK No. P.32/Menlhk-Setjen/2015 tentang Hutan Hak.

Areas within the Forest Area are also being re-allocated for other purposes besides land reform and social forestry. As of November 2017: nearly 6.8 million hectares had been released from the Forest Area for the establishment of (mostly) oil palm plantations, and another 0.9 million for transmigration sites; land exchanges in and out of the Forest Area amounted to 72,400 hectares; permission to 'borrow and use' the forest area was granted to mining and infrastructure projects in areas exceeding 500,000 hectares. See Figure 3.8 below.



Notes:
- Data as of December 2017
- Data on the Use of Forest Areas is limited to lease activities for production operation in forest areas

SOURCE: KLHK, 2017d.

▶ **FIGURE 3.8** The Release, Exchange and Use of Forest Areas up to December 2017

3.4.3 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 Indonesian Government is equipped with a number of legal instruments to address these issues, through preventative and repressive measures.[48] 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, and to monitor environmental permits.

Operations are carried out by Forest Rangers alone, and by Forest Rangers Quick Response Unit (*Satuan Polisi Hutan Reaksi Cepat*, SPORC) in cooperation with local governments, the Indonesian Armed Forces (TNI) and the Indonesian National Police (POLRI). Operations target three types of illicit activities, namely, forest area encroachment, the illegal wildlife trade, and illegal logging. Operations are held after receiving reports from the field, as well reports filed by communities or NGOs.

Encroachment operations secure the Forest Area from persons 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. The result of an encroachment operation is measured in terms of the size of the forest area that is secured.

In the case of illegal wildlife trading operations, inspections of wildlife markets are perfomed and surveillance of wildlife trading and smuggling sites is undertaken, in order to lead to capture at the precise moment a trade is conducted. The results of illegal wildlife trade operations are measured in terms of the numbers of whole bodies of animals (alive or dead) or of body part specimens (such as elephant tusks, deer heads with antlers, teeth, scales, tiger or snake skins) that are confiscated.

Meanwhile, illegal logging operations carried out at the same time as forest encroachment operations. In the forest encroachment operation, not only is the Forest Areas are secured, but also any logs remaining are confiscated as evidence of illegal logging. Illegal logging operations can also be held after a surveillance process, and lead to unannounced-inspections of a suspected illegal logging site. The results of illegal logging operations are measured in terms of the m^3 of timber that is confiscated. Table 3.2 presents a breakdown of the operation results in the period from 2015 to 2017.

Intensified supervision and monitoring is necessary to improve management and bolster prevention. In order to create strong deterrent effect, three legal instruments are applied: administrative sanctions, criminal law enforcement through both integrated and multi-door approaches, and civil law enforcement through judicial and extra-judicial approaches.

[48] Undang-Undang Republik Indonesia No. 5 Tahun 1990 tentang Konservasi Sumber Daya Alam Hayati dan Ekosistemnya, Undang-Undang Republik Indonesia No. 41 Tahun 1999 tentang Kehutanan, Undang-Undang Republik Indonesia No. 32 Tahun 2009 tentang Perlindungan dan Pengelolaan Lingkungan Hidup, Undang-Undang Republik Indonesia No. 18 Tahun 2013 Tentang Pencegahan dan Pemberantasan Perusakan Hutan, and Undang-Undang Republik Indonesia No. 37 Tahun 2014 tentang Konservasi Tanah dan Air.

Table 3.2 Number and results of operations to secure forest products in 2015-2017

NO	TYPE OF OPERATION	2015		2016		2017	
		NUMBER OF OPERATIONS	RESULTS OF OPERATIONS	NUMBER OF OPERATIONS	RESULTS OF OPERATIONS	NUMBER OF OPERATIONS	RESULTS OF OPERATIONS
1	Forest area encroach-ment	27	3,072,198 ha	18	986,529 ha	137	3,005,360 ha
2	Illegal wildlife trade	38	2,592 animals	65	6,120 animals	68	4,178 specimens
			283 specimens		5,288 specimens		4,639 specimens
3	Illegal logging	25	1,042 m^3	39	3,642 m^3	88	3,829 m^3

SOURCE: KLHK, 2018g

Administrative sanctions are including revocation of licenses, the suspension of licenses, mandatory corrective actions (*paksaan pemerintah*), written reprimands and the issuance of warning letters. In the period from 2015 to 2017, 394 administrative sanctions were imposed, as summarized in Table 3.3. There was an increase of sanctions in 2015 and 2016, because of the processing of cases, and imposition of sanctions, for perpetrators of 2015 forest and land fires. Learning lessons from 2015 and 2016, the Government issued several new regulations and strengthening law enforcement, including by sending more written warnings in 2016. Therefore, in 2017, administrative sanctions reduced, which appears to show a deterrent effect.

TABLE 3.3 Implementation of Administrative Sanctions in the Period of 2015 to 2017

NO	TYPE OF SANCTION	2015	2016	2017	TOTAL
1	Revocation of licenses	3	-	1	4
2	Suspension of licenses	21	0	0	21
3	Government-mandated corrective actions	16	90	125	231
4	Written reprimands	8	15	0	23
5	Written warnings	0	115	0	115
	Total	**48**	**220**	**126**	**394**

SOURCE: KLHK, 2018g

In cases related to forest and land fires, compliance with the terms of environmental license is monitored to ensure that corporations have the infrastructure, procedures and human resources required to prevent and manage forest fires. Since 2015, administrative sanctions have been applied in cases where violations are identified. In the three-year period (2015 to 2017) the sanctions have been applied to 159 companies (see Table 3.4). Administrative sanctions were mostly applied in 2015 and 2016, during, and in the aftermath of the tragic 2015 fire season. Supervision, monitoring, and sanctions imposed in 2016 proved to be effective that there were no administrative sanctions issued in 2017 for violations of the law related with forest and land fires.

▶ **TABLE 3.4** Administrative Sanctions Applied in Cases Related to Forest and Land Fires (2015 to 2017)

NO	TYPE OF SANCTION	2015	2016	2017	TOTAL
1	Revocation of licenses	3	-	-	3
2	Suspension of licenses	16	-	-	16
3	Mandatory corrective actions	8	17	-	25
4	Written reprimands	-	-	-	-
5	Written warnings	-	115	-	115
	Total	**27**	**132**	**0**	**159**

SOURCE: KLHK, 2018g

Extermination of confiscated wildlife specimens was held in the Headquarter of Ministry of Environment and Forestry, Manggala Wanabakti Building, Jakarta. In Indonesia, wildlife crime is the third rank after drugs and human trafficking.

LOCATION
Manggala Wanabakti Building, Ministry of Environment and Forestry, Jakarta

PHOTO BY
Simon Onggo.

In terms of criminal cases, 402 cases have progressed to the point where they were ready for trial over a three-year period (2015-2017). See Table 3.5. In addition to 275 criminal cases handled by Civil Investigators (*Penyidik Pegawai Negeri Sipil*, PPNS), another 127 cases were handled by the police with support from the Ministry of Environment and Forestry.

TABLE 3.5 Cases Progressed to the Trial Stage

NO.	TYPE OF CASE	2015	2016	2017	TOTAL
1	Illegal logging	43	66	66	175
2	Forest area Encroachment	28	29	8	65
3	Illegal wildlife trade	43	51	55	149
4	Environmental pollution	4	3	4	11
5	Forest and Land Fires	0	1	1	2
	TOTAL	**118**	**150**	**134**	**402**

SOURCE: KLHK, 2018g

The Ministry of Environment and Forestry together with relevant law enforcement institutions (the Police, the Attorney General, the Financial Transaction Report and Analysis Centre and the Financial Services Authority) are committed to multi-door law enforcement, where simultaneous charges are brought for violations of two or more of the following laws: the Corruption Erradication Act[49], the Money Laundering Crime Act[50], the Conservation Act[51] and the Forestry Act[52]. This strengthens the deterrent effect of Indonesian forest law enforcement.

The last instrument is civil law, which is enforced to ensure that business actors found guilty of violations pay compensation and environmental restoration costs. However, civil cases involve a lengthy process, and require the involvement of District Courts, the High Court and the Supreme Court.

[49] Undang-undang Republik Indonesia No. 31 Tahun 1999 tentang Pemberantasan Tindak Pidana Korupsi.

[50] Undang-Undang Republik Indonesia No. 8 Tahun 2010 tentang Pencegahan dan Pemberantasan Tindak Pidana Pencucian Uang.

[51] Undang-Undang Republik Indonesia No. 5 Tahun 1990 tentang Konservasi Sumber Daya Alam Hayati dan Ekosistemnya.

[52] Undang-Undang Republik Indonesia No. 41 Tahun 1999 tentang Kehutanan.

In the period from 2015 to 2017, 13 cases of civil law enforcement were brought by the Ministry of Environment and Forestry. Of these, 10 were brought to trial (see Table 3.6). Of these 13 cases, five resulted in *inkracht van gewijsde* or final legally binding judgments. The total penalty for compensation and restoration costs associated with environmental damage amounted to IDR 16.75 trillion or USD 1.2 billion (KLHK, 2018g).

TABLE 3.6 Results of Civil Law-Enforcement

Type of Violation	Number of companies				Damages sought and rewarded	
	Court process	*Inkracht van gewijsde*	Court Decision	Total	Final Verdict in IDR	Damages sought in IDR
Forest and Land Fires	1	3	6	10	474.23 billion	11.76 trillion
Environmental damage	1	2		3	16.28 trilion	27.48 trillion
Total	**2**	**5**	**6**	**13**	**16.75 trillion**	**39.25 trillion**

NOTES: *Inkracht van gewijsde* = legally binding final judgement

SOURCE: KLHK, 2018g

Sumatran Rhinoceros (*Dicherorhinus sumatrensis*)

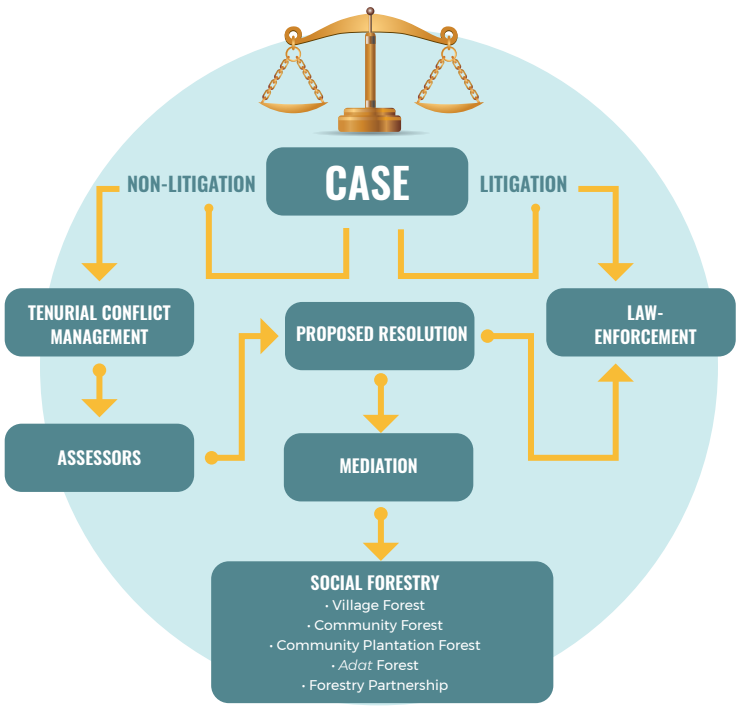
PHOTO BY
Directorate General of Natural Resources and Ecosystem Conservation, Ministry of Environment and Forestry (DJKSDAE)

3.4.4 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.

The number of complaints related to land tenure in the Forest Area and Adat forests handled by the Ministry of Environment and Forestry in the period from 2016 to May 2018 stood at 222. Of these, 77 cases were resolved; 107 are still in process; and 38 were returned to the complainant either because they lacked supporting documentation (13 cases) or because the conflict involved public lands outside the Forest Area or APL, (25 cases). The 183 cases that were either resolved or are still in process involved various types of cases.

Figure 3.9 below shows the flow of processes conducted by the Ministry of Environment and Forestry to manage land conflicts. In order to attempt to address such conflicts without recourse to litigation, a resolution process is implemented with the involvement of assessors, mediators, paralegals, and extension workers. Issues relating to a lack of certainty regarding the boundaries and status of forest areas are addressed through the deployment of assessors from the political, social, cultural, economic, 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 through an acceptance of the 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. An example of a case of conflict management is presented in Box 3.2.



SOURCE: KLHK, 2017f

▶ **FIGURE 3.9** Conflict Management Flow Chart

Box 3.2

Lessons Learned from Conflicts in forested areas surrounding Jambe Bay

Forested public lands around Jambe Bay, West Java cover 54,000 hectares and are known as Tegal Waroe London. Eighteen thousand hectares are part of the Forest Area, and the remaining area is public lands designated for other purposes (APL). A number of corporations hold licenses to manage these areas.

The area around Jambe Bay is developing rapidly, triggering a process of urbanisation that has resulted in the migration of a large number of people from surrounding areas in search of work. It has also resulted in conflicts related to land tenure in the forest areas, largely due to the following factors: (1) the widely-held (but erroneous) perception that this forest area is 'free' state land that can be used for a range of purposes; (2) the forest areas possess a high intrinsic value for a range of strategic industrial and other development purposes; (3) there are a lack of clear boundaries between forest area and areas to which individuals and community and other groups hold rights; (4) many community activities have been conducted in the forest area for long periods of time; (5) rumor to secure land certification and ownership are perceived as being of inordinate benefit to a narrow set of interests and groups.

Efforts to manage these conflicts were conducted from 2007 to 2017, with the direct involvement of central government agencies, and cross-institutional coordination between the Ministry of Environment and Forestry, the Ministry of Agrarian Affairs and Spatial Planning, the National Land Agency, and the Presidential Secretariat.

The central government through the Ministry of Environment and Forestry first conducted assessments and then resolved conflicts with the result that the Forest Area in the Jambe Bay area will be managed going forward according the concepts of Forestry Partnerships and Social Forestry.

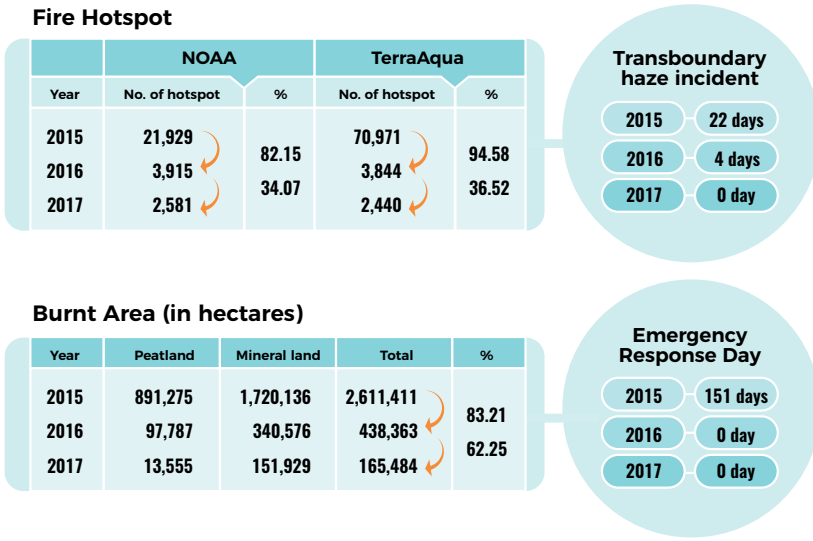
To facilitate the implementation of Forest Partnerships and Social Forestry, the Ministry of Environment and Forestry issued Ministerial Decree No. SK.5320 / Menlhk-PSKL / PKPS / PSL.0 / 10/2017 on 16 October 2017 to grant permits for the utilization of an area of 1,566 hectares for Social Forestry programs to the Association of Independent Farmers Groups of Teluk Jambe Bersatu (Gabungan Kelompok Tani Mandiri Teluk Jambe Bersatu), which is made up of 783 households. The area is located in the Production Forest of the Purwakarta Perum Perhutani Working Area Forest Management Unit, in Ciampel, Pangkalan, West Jambe Bay and East Jambe Bay Subdistricts, Karawang District, West Java. ■

SOURCE: KLHK, 2017f

3.5 Forest and Land Fire Management

Forest and land fires in Indonesia have attracted global attention since the devastating fires in 1982/1983[53] 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.[54]

In 2014, as a commitment to mitigate transboundary haze pollution, Indonesia ratified the ASEAN Agreement on Transboundary Haze Pollution (AATHP)[55] which provides a framework for the control of forest and land fires at the regional level. In accordance with AATHP, specific targets related to forest and land fire control activities have been set for the period from 2015 to 2019. 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, and mainstreaming 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. In 2016 and 2017, through these activities and other measures (See Box 3.3), the Indonesian Government significantly improved its ability to manage forest and land fires, as demonstrated in Figure 3.10, below.



SOURCE: Dit. PKHL, 2018

▶ **FIGURE 3.10** Reductions in forest and land fires from 2015 to 2017

[53] Syaufina, 2015

[54] Syaufina, 2015

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

Box 3.3

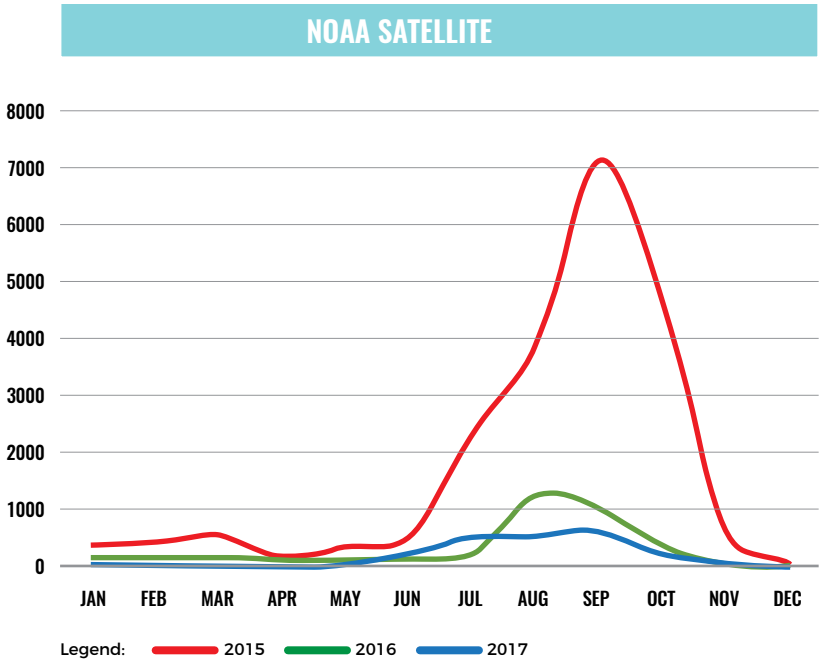
Forest and land fires monitoring in Indonesia

The burning of forests and land have been monitored since 1984. Initially using a bottom-up approach, government offices in the regions across the country reported fire events and the sizes of burned area size. From 1997 to 2010, Indonesia undertook the centralized monitoring of hotspots, in cooperation with Japan International Cooperation Agency (JICA). During those years, NOAA satellites were used, even though coverage only reached the western and central regions of Indonesia. After the JICA project, Indonesia continued to monitor hotspot data using NOAA satellite, first because historical data recorded since 1997 allowed for better comparability, and second because hotspot data from NOAA satellite served as the basis for ASEAN forest and land fires discussions. However, since 2000 Terra Aqua (MODIS) satellites have also been used to monitor hotspots. Terra Aqua satellites have special sensors for detecting fires and cover the whole country, from the west to the east of Indonesia.

With advances in technology, since 2015 the monitoring of burning area has used integrated methods, combining Landsat satellite images, hotspot data from NOAA and Terra Aqua satellites, and field data derived from regional government offices. In this way, the calculation of areas burnt in forest and land fires events has even higher accuracy, which means levels of uncertainty have declined compared to previous periods. ■

CONTRIBUTOR: Directorate of Forest and Land Fires Management, DG of Climate Change, Ministry of Environment and Forestry, 2018.

Figure 3.11 below shows monthly trends in the number of hotspots in the period from 2015 to 2017. 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-November. The same trends were observed in 2016 and 2017.

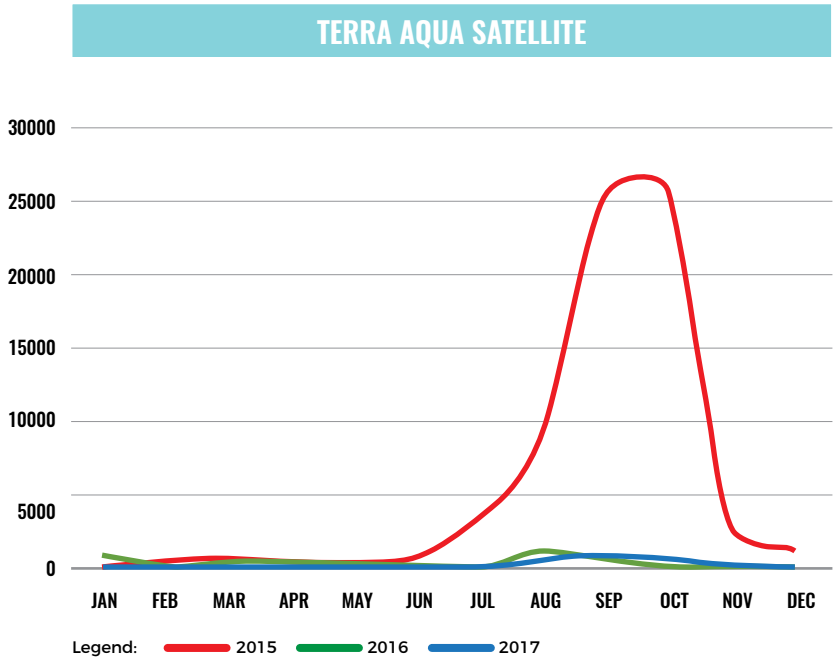


Notes:
Data derived from NOAA satellites managed by ASEAN.
The hostspot data only covers **the western and central regions of Indonesia**.
The data is **used to calculate** the number of hotspots at the ASEAN regional level.

SOURCE: KLHK, 2018h

▶ **FIGURE 3.11** Number of monthly hotspots from 2015 to 2017 based on the NOAA Satellite data

Using data derived from Terra Aqua satellites for the same period (2015-2017), similar trends can be observed (see Figure 3.12). While this data covers all regions of Indonesia, including the eastern region, it is not used to calculate the number of hotspots at the ASEAN regional level. The highest number of hotspots was recorded in 2015, with a relatively high proportion of incidents occurring in February-March and in June-November. The same trends were observed in 2016 and 2017.



Notes:
Data derived from Terra Aqua satellites.
The satellite covers **all regions of Indonesia**, including the eastern region.
The data is **not used to calculate** the number of hotspots at the ASEAN regional level.

SOURCE: KLHK, 2018i

▶ **FIGURE 3.12** Number of monthly hotspots from 2015 to 2017 based on Terra Aqua Satellite data

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. In 2016, the President explicitly emphasized the importance of effective early warning and prevention systems, systems of reward and punishment, and the importance of improving field reviews, law enforcement and synergies between central and local government agencies.[56] In 2017, the President called upon all elements of society to play a role in preventing forest and land fires through participation and support for air operations, law enforcement, effective forest and land governance, and improved coordination and synergy.[57] In 2018, the President again called on all elements of society to play a role in the prevention of forest and land fires through participation in early warning systems, improved synergies between all stakeholders, compliance with obligations, and 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.

In order to implement forest and land fire prevention, Indonesia has established a national program for forest and land fire control, including the following measures:

1. **Early Warning and Detection Systems**

   Early warning and detection activities include the daily monitoring of data derived from the Fire Danger Rating System (FDRS) (*Sistem Peringkat Bahaya Kebakaran*, SPBK), hotspot data, weather, 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 (*Kementerian Lingkungan Hidup dan Kehutanan*, KLHK), the Meteorology, Climatology and Geophysics Agency (*Badan Meteorologi, Klimatologi, dan Geofisika*, BMKG), the National Disaster Management Agency (*Badan Nasional Penanggulangan Bencana*, BNPB) and the Geospatial Information Agency (*Badan Informasi Geospasial*, BIG), with the KLHK appointed as data custodian.

2. **Early Response**

   Early response activities are conducted as a response to early warning and detection activities. These

[56] Delivered by President Joko Widodo at the National Coordination Meeting on Forest and Land Fire Prevention in front of heads of ministries/agencies, TNI/POLRI and governors from across Indonesia, on January 18, 2016 at the State Palace.

[57] Delivered on 23 January 2017.

activities may include routine land and air patrols, integrated patrols, hotspot ground checks and/or activities to extinguish fires. Patrols are conducted to check areas particularly prone to forest and land fires and to rapidly identify cases that require further action. Integrated patrols are conducted with the involvement of the Ministry of Environment and Forestry's Forest and Land Fire Brigades (*Manggala Agni*), Armed Forces Non-Commissioned Officers for Village Guidance (*Babinsa*), National Police Public Order and Safety Officers (*Bhabinkamtibmas*), village-level officials and government organizations, NGOs, the media, Forest Management Units (KPH) and Regional Agencies for Disaster Management (BPBD).

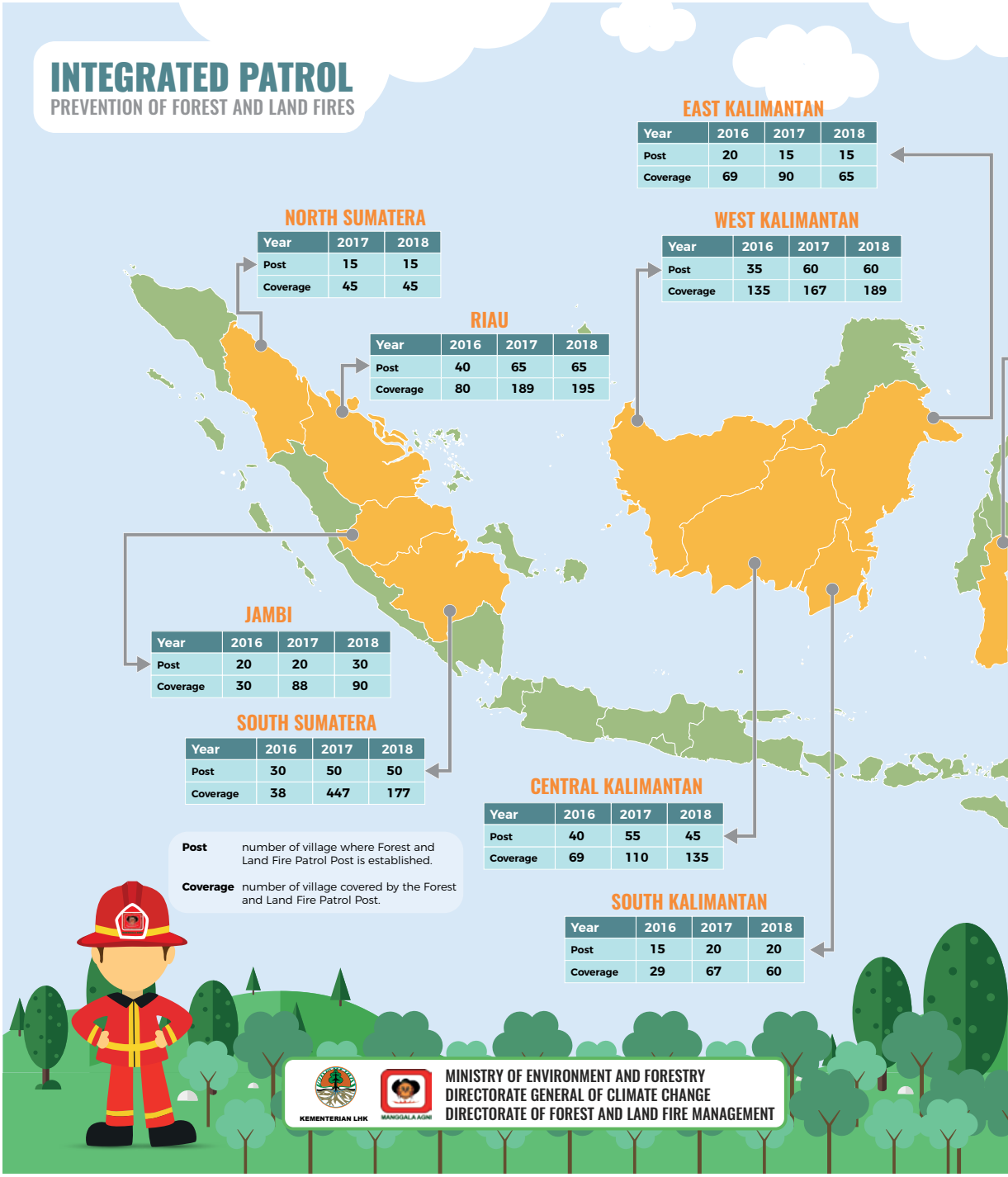
Based on the latest available data, integrated patrols have been conducted in 1,203 villages, including 731 villages particularly prone to forest and land fires (see Figure 3.13). These patrols conducted a number of activities, including monitoring to identify hotspots, ground checks, the extinguishing 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.

3. Forest and Land Fires Awareness, and Community Involvement

Direct measures to raise community awareness regarding forest and land fires include the provision of counseling through social, religious and school forums, mass media campaigns, radio and television talk shows and exhibitions. It is hoped that the community's awareness of the importance of preventing forest and land fires will heightened.

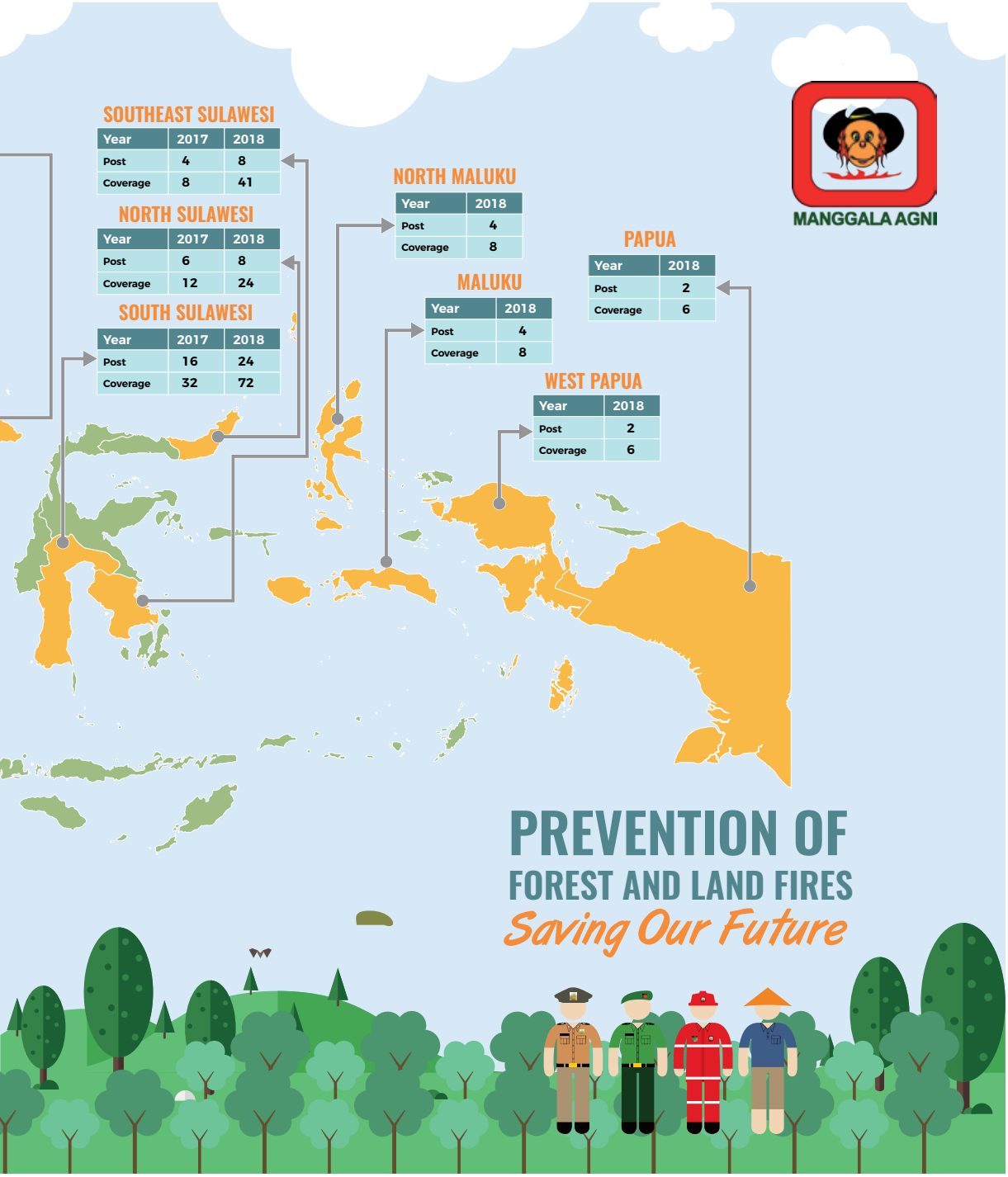
Community empowerment programs are conducted to establish community level fire fighting units and fire-free villages. Four thousand and one (4,001) Fire-Aware Villages (*Desa Peduli Api*) have been established with support provided by the Ministry of Environment and Forestry, district level governments, and the private sector. Meanwhile, private-sector supported Fire-Free Village (*Program Desa Bebas Api*) programs have been established 218 villages. Community-level livelihood improvement programs have been facilitated in 87 Villages. Training has been provided to 56 villages.

A land preparation without burning program has also been implemented to encourage communities to engage in activities such as composting, charcoal briquetting, vinegar production and so on. One of many examples of the application of the program for land clearing without burning (*Pengolahan Lahan Tanpa Bakar*, PLTB), is the one implemented by Mr. Taman, a member of the community from Klampangan village, Palangkaraya city, Central Kalimantan province. He practiced fire-free peatland management through a combination of the productive planting of crops, the intercropping of Jelutung (*Dyera lowii*) with annual crops, and the drilling of wells.



SOURCE: KLHK, 2018h

▶ **FIGURE 3.13** Integrated Patrols to control forest and land fires in 2017


SOUTHEAST SULAWESI
Year 2017 2018
Post 4 8
Coverage 8 41
NORTH SULAWESI
Year 2017 2018
Post 6 8
Coverage 12 24
SOUTH SULAWESI
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Post 16 24
Coverage 32 72
NORTH MALUKU
Year 2018
Post 4
Coverage 8
MALUKU
Year 2018
Post 4
Coverage 8
PAPUA
Year 2018
Post 2
Coverage 6
WEST PAPUA
Year 2018
Post 2
Coverage 6
MANGGALA AGNI
PREVENTION OF
FOREST AND LAND FIRES
Saving Our Future

4. Norms, Standards and regulations

Regulations related to the management of forest and land fires that were issued during the period between 2015 to 2018 include:

- A Ministry of Environment and Forestry Regulation concerning Forest and Land Fire Control, which regulates matters related to organizational structures, human resources, and other issues; [58]
- A Ministry of Agriculture Regulation concerning Brigades and Guidelines for the Prevention and Control of Land and Garden Fires; [59]
- A Ministry of Environment and Forestry Regulation concerning the Indonesian National Qualification Framework and Competency Certification for Forest and Land Fire Control; [60]
- A Ministry of Environment and Forestry Regulation concerning Procedures for Field Monitoring of Hotspots and/or Forest and Land Fire Information; [61]
- A Ministry of Environment and Forestry Regulation concerning the Technical Criteria for States of Emergency Related to Forest and Land Fires.[62]

5. Capacity Building and Improving Forest and Land Fire Control

Capacity building activities include the following: (i) the 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.

Ongoing measures are required to maintain and improve forest and land fire control infrastructure, given that this infrastructure is subject to degradation due to frequent use. In addition, existing infrastructure, some of which was first constructed in 2002, may need to be replaced and updated. Since 2015, the new establishment of infrastructure to control fires on peatlands has focused upon the construction of canals, ponds and boreholes.

6. Law Enforcement and Post-Forest and Land Fire Management

Post-fire management involves activities such as the identification and monitoring of areas affected by fires; the mapping of affected lands; the rehabilitation of affected lands; law enforcement through the imposition of administrative, civil, and/or criminal sanctions against individuals and/or corporate entities engaged in violations that have led to fires.

[58] Peraturan Menteri LHK No. P.32/MENLHK/SETJEN/KUM.1/3/2016 tentang Pengendalian Kebakaran Hutan dan Lahan.

[59] Peraturan Menteri Pertanian No. 47 Tahun 2014/Prementan/OT.140/4/2014 tentang Brigade dan Pedoman Pelaksanaan Pencegahan serta Pengendalian Kebakaran Lahan dan Kebun.

[60] Peraturan Menteri LHK No. P.47/MENLHK/SETJEN/KUM.1/7/2017 tentang Kerangka Kualifikasi Nasional Indonesia dan Sertifikasi Kompetensi Bidang Pengendalian Kebkaran Hutan dan Lahan.

[61] Peraturan Menteri LHK No. P.8/MENLHK/SETJEN/KUM.1/3/2018 tentang Prosedur Tetap Pengecekan Lapangan Informasi Titik Panas dan/atau Informasi Kebakaran Hutan dan Lahan.

[62] Peraturan Menteri LHK No. P.9/MENLHK/SETJEN/KUM.1/3/2018 tentang Kriteria Teknis Status Kesiagaan dan Darurat Kebakaran Hutan dan Lahan.

Forest and land fires suppression in East Kalimantan Province

LOCATION
East Kalimantan

PHOTO BY
Manggala Agni Paser Operational Jurisdiction, Ministry of Environment and Forestry

7. International Cooperation

Indonesia has formally ratified the ASEAN Agreement on Transboundary Haze Pollution (AATHP).[63] Since its ratification of this agreement, Indonesia has a stronger position on which 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).

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

3.5.2 The focus of forest and land fire control

In 2016 and 2017, the number of identified hotspots and cases of forest and land fires declined significantly, with this decline attributable to both intensified control measures and to climatic factors. However, the absence of fires over the past two years creates a challenge, as it has resulted in the buildup of flammable materials in forests and peatlands. If early detection and prevention measures are not implemented appropriately, the risk of major fires in 2018 is significant. To prevent this, forest and land fire control measures in 2018 will focus on the following:

- Ensuring that integrated patrols are conducted in 731 villages in Sumatra and Kalimantan that are identified as being the most vulnerable to forest and land fires, building on the integrated patrol program conducted in the period from 2015 to 2017.
- Ensuring that integrated patrols are conducted in 50 villages outside Sumatra and Kalimantan that have been identified as being the most vulnerable to forest and land fires.
- Providing coaching and other assistance to ensure that 300 new Fire-Aware Villages are established.
- Establishing Forest and Land Fire Brigades (*Manggala Agni*) in 35 operational areas in Sumatra, Kalimantan and Sulawesi, with the deployment of 1,980 associated personnel.
- Building the capacities of Forest Management Units (KPH) to play an effective role in the control of forest and land fires within their respective jurisdictions.
- Building capacities to extinguish forest and land fires, and conducting air patrols and extinguishing activities.

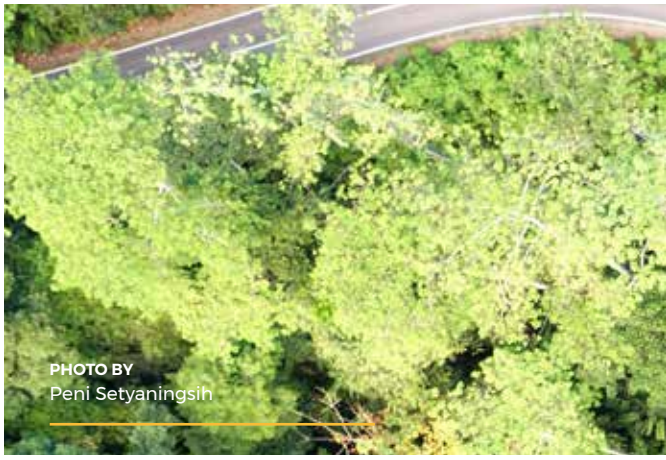


PHOTO BY
Peni Setyaningsih

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, particularly forums associated with the United Nations Framework Convention on Climate Change (UNFCCC).

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 is representing 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 the Reduction of Greenhouse Gas Emissions from Deforestation and Forest and Peatland Degradation (*Badan Pengelola Penurunan Emisi Gas Rumah Kaca dari Deforestasi, Degradasi Hutan dan Lahan Gambut*, BP REDD+).[64]

[64] Peraturan Presiden Republik Indonesia No. 16 Tahun 2015 tentang Kementerian Lingkungan Hidup dan Kehutanan.

3.6.1 The Nationally Determined Contribution (NDC) of the forestry sector

Indonesia has committed to a Nationally Determined Contribution (NDC) 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). 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 percent of the 41 percent in conditional reductions. The forestry sectors 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 sector, IPPU (*Industry Process and Production Use*), and agricultural sectors.[65] 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.

Prior to their attendance at the Conference of the Parties (COP) 21 in Paris, participating nations were requested to submit their Intended Nationally Determined Contribution (INDC) to the UNFCCC Secretariat. Following the adoption of the Paris Agreement, Indonesia ratified this agreement and committed to promulgating its first NDC by 2016. This process has now been completed, with the NDC included in the UNFCCC's Interim Registry for NDCs.[66]

In an intervention at the COP 22, which was held in Morocco, the Indonesian Minister of Environment and Forestry announced Indonesia's achievements in terms of its NDC (see Box 3.4). Amongst others, these included reducing emissions from deforestation and forest degradation, sustainable management of forests and enhancing carbon stocks (REDD+).

[65] Republic of Indonesia. 2016. First Nationally Determined Contribution of Republic of Indonesia.

[66] Undang-Undang Republik Indonesia No. 16 Tahun 2016 tentang Pengesahan Paris Agreement to the United Nations Framework Convention on Climate Change (Persetujuan Paris atas Konvensi Kerangka Kerja Perserikatan Bangsa-Bangsa Mengenai Perubahan Iklim).

Box 3.4

Excerpt of Indonesia's Statement to the Climate Change Summit 22, Marrakech, Morocco, 2016

As Indonesia's constitution mandates the rights of each citizen to a safe, dignified, decent life, and a healthy environment, we are committed to enhance pre-2020 actions and implement our post 2020 commitment. We have implemented a number of policies, such as: (i) strengthening our one map policy; (ii) enforcing a moratorium on primary natural forest conversion; (iii) reviewing existing licenses on peatland; (iv) restoring degraded peatlands and peat ecosystems; and (v) allocating 12.7 million hectares for social forestry programs.

The government has been working closely with all stakeholders including scientists and civil society to enhance the prosperity of people in and surrounding our Forest Areas. Our NDC consists of many important commitments, including:

In the land sector: reducing emissions from deforestation and forest degradation, sustainable management of forest, conservation and enhancement of carbon stocks (REDD+);

In the energy sector: development of clean energy sources and an ambitious energy mix policy that targets 23 percent new and renewable energy by 2025, and 31 percent by 2050, and a reduction of coal to 30 percent by 2025 and 25 percent by 2050.

Indonesia's NDC also emphasizes the need for a comprehensive climate change adaptation and mitigation strategy, taking into account Indonesia's unique geographical condition and location. Transparency, enforcement, and compliance remain fundamental for successful implementation of our commitment. Thus, we have established an integrated 'National Registry System', a climate finance institution, and climate funding instruments.

Indonesia also believes that beyond the sectoral dimension, moral and ethical values as well as social considerations play a significant role in sustainable development, climate change, and enhancing national resilience. Finally, Indonesia is of the view that in preparing the rulebook for implementing the Paris Agreement, it is important for all Parties to understand the delicacy of the balance that has now been reached, and to avoid renegotiating the agreement. ■

SOURCE: DJPPI, 2018A.

The deforestation rate envisioned under Indonesia's business as usual (BAU) scenario for 2013-2020 is in line with it's Forest Reference Emission Level (FREL) for REDD+, which is about 0.920 million hectares per year of planned and unplanned deforestation. To lower the rate of deforestation below BAU levels, Indonesia will undertake two sets of Counter Measures, CM1 and CM2. By employing these Counter Measures, planned and unplanned deforestation from 2013 to 2020 will not exceed 0.450 milllion hectares. Looking to the future, the forecasted BAU rate of deforestation for 2021-2030 is assumed to be 0.820 million hectares per year. Using CM1 and CM2, Indonesia will lower the rate of deforestation to 0.325 million hectares per year during the third decade of the century[67].

Measures to reduce emissions resulting from deforestation and forest degradation are subsumed under the REDD+ program, which is a particularly significant mitigation measure for the forestry sector. The REDD+ program promotes policy approaches and incentive mechanisms for actions to reduce the level of emissions from deforestation and the degradation of forests; to intensify the role of conservation measures; sustainable forest management; and increased carbon stocks. As such, the REDD+ plays a significant role in the achievement of Indonesia's NDC targets.

3.6.2 REDD+: a strategy to achieve the NDC target from the forestry sector

REDD+ is a policy that provides national scale positive incentives with a phase-based approach. REDD+ in Indonesia takes a national approach, with sub national implementation in three phases – readiness, transition, and full implementation with result-based payments. As of now, Indonesia has reached the full implementation phase, but without result-based payments.

In response to international guidance from the UNFCCC on REDD+ implementation, and as part of the commitment to the implementation of the REDD+ scheme as a climate mitigation action, Indonesia has developed a REDD+ infrastructure, consisting of the following, with further details displayed in Table 3.7:

1. The REDD+ National Strategy was published in 2012 and remains relevant to today's situation;
2. A National FREL benchmark to evaluate emission reduction achievements was submitted to the UNFCCC Secretariat in 2015, and successfully passed a technical assessment by UNFCCC experts in 2016;
3. A National Forest Monitoring System (NFMS), which is an enhancement of the National Forest Inventory (NFI) program, have been in place since 1986; and
4. A Safeguards Information System (SIS) was developed in 2013 and operates through an interactive web-based system.

[67] Republic of Indonesia. 2016. First Nationally Determined Contribution of Republic of Indonesia.

TABLE 3.7 Indonesia's progress towards the implementation of REDD+

Components of the REDD+ Framework mandated by the Cancun Agreement of 2010	Indonesia's progress
National REDD+ strategy	- A national REDD+ strategy has been prepared.[68,69] - 11 provinces have formulated provincial level REDD+ strategies and action plans.[70]
Forest Reference Emission Level/FREL	- Indonesia submitted its FREL to the UNFCCC in 2015, with a technical evaluation conducted in 2016.[70] - FREL for a number of provinces have been included in provincial level strategies and action plans.[69] - Sub-national FREL are being prepared in a number of provinces (Aceh, South Sumatra, West Kalimantan, East Kalimantan, Central Kalimantan, and West Papua).[70]
National Forest Monitoring System (NFMS)	- The NFMS has been developed and is operational.[70] - A number of regulations related to evaluation, reporting, and verification of reductions in carbon emission levels have been promulgated.[69,71] - A National Registry System has been launched and is operational. [68,70] - A National Inventory System for Greenhouse Gas Emissions (*Sistem Inventarisasi Gas Rumah Kaca Nasional*, SIGN-SMART) has been developed and is operational.[70]
Safeguards Information System (SIS)	- SIS REDD+ has been developed.[68,69,70] - The SIS is operational in three provinces (East Kalimantan, Jambi, and West Kalimantan).[69]
Funding mechanisms for REDD+	A government regulation concerning Economic Instruments for the Environment has been issued,[72] with an associated funding system still under consideration by the Ministry for Finance. [69]
Institutional arrangements for REDD+	- A task force for the institutional arrangements for REDD+ was established on 20 September 2010 and remained in force until 30 June 2011. - A task force was re-established on 8 September 2011 and remained in force until 31 December 2012 and was later extended to 30 June 2013. - REDD+ working groups have been established in a number of provinces since 2011. - BP REDD+ was established on 31 August 2013 and ran until 21 January 2015, at which point it was integrated into the Ministry of Environment and Forestry. - The Directorate General of Climate Change was established on 21 January 2015.

SOURCE: MoEF, 2016; MoEF, 2018

[68] P3SEKPI, 2017.

[69] DJPPI, 2017.

[70] Republic of Indonesia. 2016. First Nationally Determined Contribution of Republic of Indonesia.

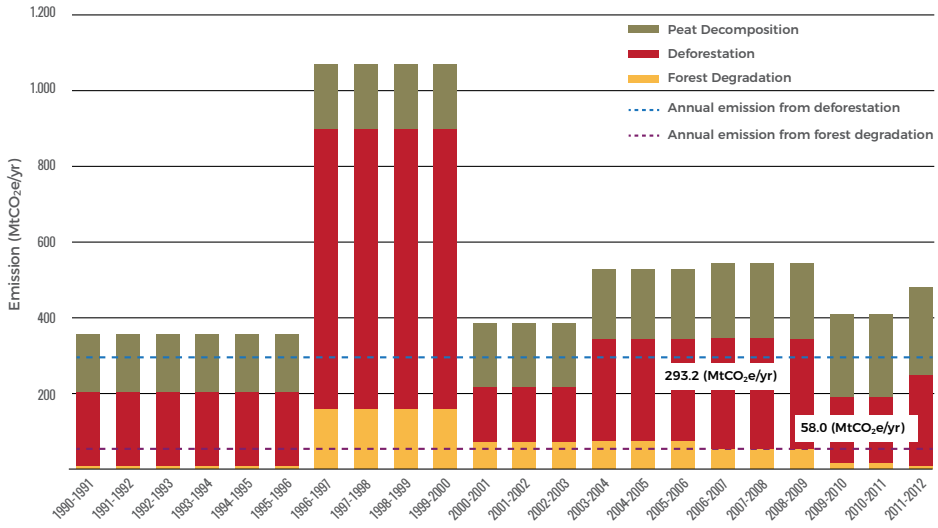
[71] Peraturan Presiden Republik Indonesia No. 71 Tahun 2011 tentang Penyelenggaraan Inventarisasi Gas Rumah Kaca Nasional; Peraturan Menteri Kehutanan No. P.30/Menhut-II/2009 tentang Tata Cara Pengurangan emisi dari Deforestasi dan Degradasi Hutan (REDD); Peraturan Menteri Kehutanan No. P.20/Menhut-II/2012 tentang Penyelenggaraan Karbon Hutan; Peraturan Menteri Kehutanan No. P.50/Menhut-II/2014 tentang Perdagangan Sertifikat Penurunan Emisi Karbon Hutan Indonesia atau Indonesia Certified Emission Reduction.

[72] Peraturan Pemerintah Republik Indonesia No. 46 Tahun 2017 tentang Instrumen Ekonomi Lingkungan Hidup.

A national MRV system for REDD+ implementation has been developed, supported by the NFMS. A system for results-based payments and related instruments has also been erected. Finally, following on from the transparency framework agreed to at the 2015 Paris COP, and the codification of that agreement into Indonesian national law, the government has built a National Registry System on Climate Change (NRS CC/SRN) for collecting information on all activities undertaken in support of climate change adaptation and mitigation, and 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, overlaps in reporting, double-reporting and double-counting, as well as prevent any lack of synchronization between actions for climate change adaptation and mitigation. The system is intended to register and acknowledge all actions taken by all stakeholders to reduce CO_2 emissions. Other than reducing emissions, REDD+ in Indonesia has also contributed to sustainable forest management, for example, by establishing the National Forest Monitoring System.

In the current first period on the implementation of REDD+ through the end of 2020, the National Forest Reference Emission Level (FREL) in Figure 3.14 has been supplemented with maps of the areas used for the preparation of the FREL (see Appendix 4). On the basis of the data used to establish the FREL, REDD+ Performance Measurement Areas (*Wilayah Penilaian Kinerja* or WPK) were also mapped (see Appendix 5). The REDD+ Performance Measurement Areas serve as a technical guideline for the implementation of Indonesia's REDD+ program and as a reference to assess its performance, including in terms of obtaining performance-based payments for reductions in emissions. The areas to be measured, verified and mapped in order to receive results-based payments for emissions reduction outcomes and non-carbon benefits must be the same areas as those used to establish the FREL.



Notes:
Annual emission and average historical emission from deforestation and forest degradation, and peat decomposition as results of deforestation and forest degradation in peatlands (in $MtCO_2e$ per year) in Indonesia, from 1990 to 2012.

SOURCE: KLHK 2018j

▶ **FIGURE 3.14** Annual and average annual historical emissions from deforestation, forest degradation and associated peat decomposition (in Mt CO_2) in Indonesia from 1990 to 2012

REDD+ activities are planned and conceived at the national level but implemented at the sub-national level. Although REDD+ activities are implemented at the sub-national level, the level of reduction of GHG emission are calculated at the national level to determine the overall success of the program. Sub-national FRELs have been drafted to provide direction to enable sub-national entities to formulate action plans within the REDD+ framework in their respective territories and as a reference to calculate GHG emission reductions and/or increases to carbon stock at the provincial level. Sub-national FREL were derived from the national FREL, with the accumulated total of sub-national FRELs not exceeding the quoted defined by the national FREL quota.

During the period of 2013 to 2017, Indonesia cut its emissions by 358 $MtCO_2e$, as a result of reductions in deforestation and degradation, as measured against 1990 to 2012 baseline emissions (Table 3.8). This was equal to a 20.4 percent emission reduction against the baseline. The largest contribution was from avoiding deforestation activity, which accounted for 85 percent of total emission reductions, while reductions from degradation accounted for only 15 percent. Emissions from peat decomposition were above both the original as well as an adjusted baseline, and thus reduced Indonesia's overall emissions reductions. If emissions from peat decomposition against the adjusted baseline are included, total forest and land-based emissions reductions from 2013 to 2017 were 305 $MtCO_2e$, with an annual average reduction of 61 $MtCO_2e$[73].

TABLE 3.8 Reductions in emissions (tCO_2e) from deforestation and forest degradation from 2013 to 2017

	Emission Reduction (t CO_2e)					
	Deforestation	**Forest degradation**	**Peat decomposition against the original baseline**	**Peat decomposition against an adjusted baseline**	**Total without peat**	**Total with peat (adjusted)**
Average	61,054,319	10,570,143	- 22,646,035	- 7,030,866	71,624,462	60,993,597
Total	305,271,594	52,850,717	-113,230,175	-35,154,328	358,122,311	304,967,983

SOURCE: MoEF, 2018.

[73] MoEF, 2018.

For the future, the Ministry of Environment and Forestry has developed plans to improve the implementation of REDD+. To improve technical aspects of implementation, planned measures include updating the National Forest Monitoring System (NFMS); updating the forest carbon stock database (to include the strengthening of the National Forest Inventory/NFI); developing 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 a one-map policy; a 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 capacities to manage and restore peat ecosystems; and policies related to social forestry. A ministerial regulation related to REDD+ implementation has been issued and a climate financing regulation is currently being drafted.

3.6.2.1 REDD+ Funding Instruments

The government of Indonesia is currently in the process of developing the Environmental Fund Management Agency (*Badan Pengelola Dana Lingkungan Hidup*, BPDLH). This is a public service agency (*Badan Layanan Umum*, BLU) managed by the Ministry of Finance in collaboration with other relevant ministries/agencies such as National Development Planning Agency (BAPPENAS), the Ministry of Energy and Mineral Resources, the Ministry of Industry, and the Ministry 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 Environmental Fund Management Agency (BPDLH). The government is now in the final stages of preparing the Presidential Decree on the establishment of BPDLH and its supporting systems. In anticipation of the imminent establishment of the BPDLH, the government is starting work ahead of time on the BPDLH's Strategy Business Plan, Standard for Services, and Systems for Financial Reporting.

The objective of the establishment of BPDLH 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. BPDLH is expected to adopt international standards in terms of 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 BPDLH will employ an asset management principle that separates assets from the fund manager (BPDLH) by utilizing a custodian bank as a trustee, all in the interest of accountability.

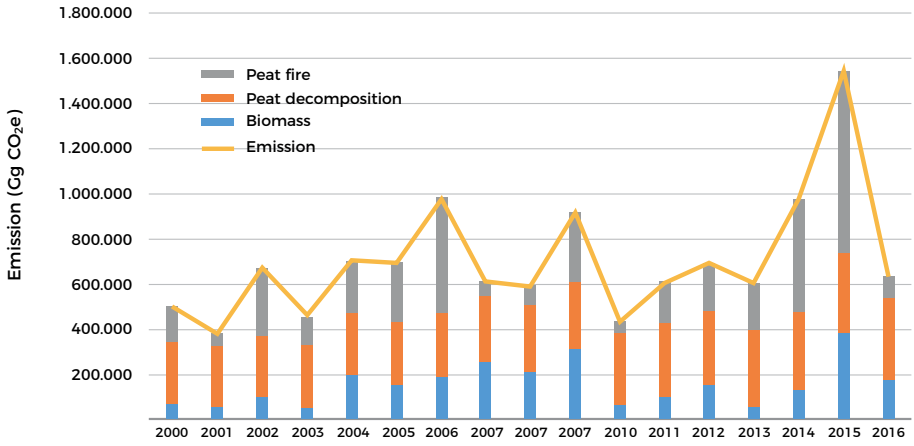
Fund distribution by the BPDLH will be based on criteria and indicators determined by the BPDLH, by associated ministries and in consultation with potential donors. The funds could be distributed through different schemes, such as grants, loans, result based payments, a domestic carbon market, and other legal mechanisms. The BPDLH will have several funding windows to cater to different purposes such as nature conservation, climate change, and addressing environmental degradation.

A REDD+ financing scheme has also been developed through Environment and Forestry Ministerial Regulation No. 70 of 2017 on the Implementation of REDD+. This regulates the distributions of expected benefits from REDD+ to various entities. A REDD+ Funding Instruments will be specifically addressed under the BPDLH.

3.6.3 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 2016, the average annual level of emissions stood at 709,409 Gg CO_2e. If emissions from peat fires were to be excluded, the average annual level of emissions would be 466,035 Gg CO_2e, with most of that coming from peatland decomposition, which emitted an annual average of 304,377 Gg CO2e. Figure 3.15 shows the emission levels of the forestry sector and peatlands.

In term of emissions from the forestry sector and their relationship toward NDC achievement, Indonesia's annual achievement in forest sector reductions between 2010 and 2015 are described in Table 3.9.



Notes:
Gg = Gigagram
1 Gg CO_2e = 1,000 ton CO_2e

SOURCE: KLHK, 2018j

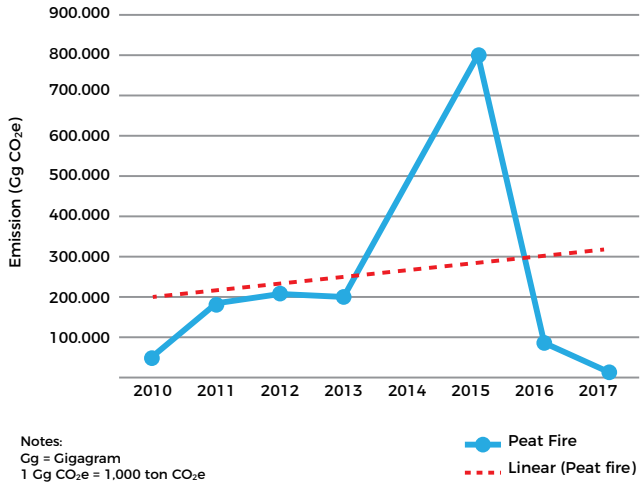
▶ **FIGURE 3.15** National emissions from the Forestry Sector and from Peatlands (2000 to 2016)

TABLE 3.9 GHG emission inventory from the forestry sector and its contribution to the NDC (2010 to 2015)

Emission	Unit	Target 2030	2010	2011	2012	2013	2014	2015
Inventory LULUCF	Mton CO_2e		383	427	488	402	480	742
Inventory Peat fire	Mton CO_2e		51	189	207	205	499	803
Inventory Total	Mton CO_2e		434.79	616.34	694.98	607.33	979.42	1545.07
BAU	Mton CO_2e		646.55	769.25	770.84	767.69	766.42	765.09
Reduction from BAU	Mton CO_2e	497	211.76	152.92	75.86	160.36	-213.01	-779.98
Progress toward 2030	%	17.2	7.33	5.29	2.63	5.55	-7.37	-26.99

SOURCE: DJPPI, 2018b

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 90,267 Gg CO_2e, from the figure of 712,602 Gg CO_2e recorded in 2015. In 2017, the level of emissions from peat fires declined further, to 12,513 Gg CO_2e (see Figure 3.16).



SOURCE: MoEF, 2018

FIGURE 3.16 Emissions from peatland fires in the period up to 2017

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."[74] 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. Appendix 6 presents a full description of the development of peat ecosystem protection and management policies.

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 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.[75] This pair of Government Regulations are now being further implemented through the issuance of an additional pair of Ministry of Environment and Forestry regulations.[76] 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 Government Regulation of 2016, in particular, cites the protection function of peat ecosystems is based on the fact that they protect and preserve water balances, store carbon, and conserve biodiversity. The Government Regulation in 2016, mandates:[77]

- That at least 30 percent of the total area of the 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 Government Regulation also mandates the protection of peatlands with:

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

[75] 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.

[76] 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.

[77] 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).

Planting on peatland - ASEAN Peatland Forests Project (APFP) 2010-2014

LOCATION
Jabiren Village, Jabiran Raya Sub-district, Pulang Pisau District, Central Kalimantan Province

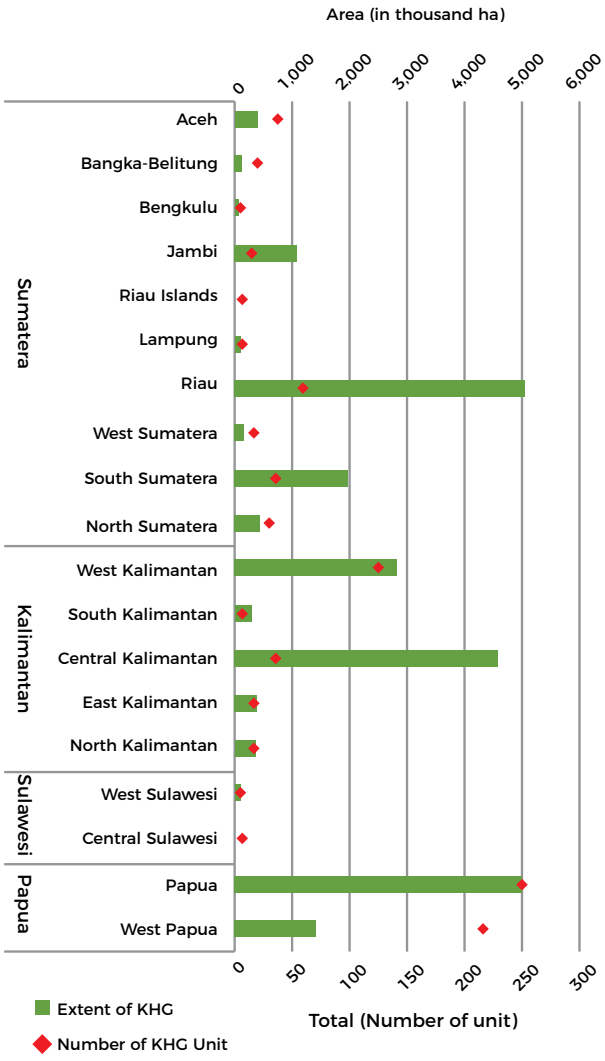
PHOTO BY
Directorate of Peat Destruction Control, Directorate General of Pollution and Environmental Destruction Prevention, Mnistry of Environment and Forestry (Dit. PKG, DJPPKL)

a. peat soil depths of three meters or more;
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 will restore around two million hectares of peatland in seven provinces, these being Riau, Jambi, South Sumatra, West Kalimantan, Central Kalimantan, South Kalimantan, and Papua. In short, the Government 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 peatland utilization; (3) prohibiting further land clearing in 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 area that were burnt in 2015; and (6) requesting industrial and crop plantations to restore peatland by building canal blockages to maintain water level at minimum 0.4 meter. The Government also enhanced law enforcement on the ground and reinforced rehabilitation and restoration for degraded peatlands, among others, by establishing Peat Restoration Agency (Badan Restorasi Gambut/BRG) through Presidential Regulation No. 1 of 2016.

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 spread across Sumatra, Kalimantan, Papua and, to a lesser extent, Sulawesi (see Appendix 6). An inventory of peat ecosystems

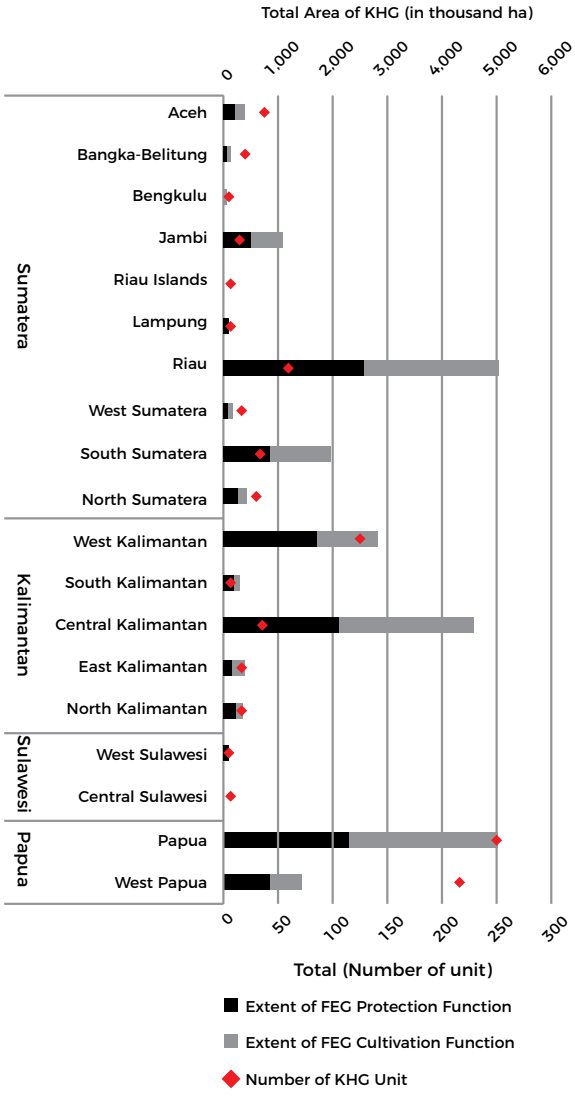


SOURCE: KLHK, 2017i

▶ **FIGURE 3.17** Number and Extent of National Peat Hydrological Unit (KHG).

is a necessary first step to determine the characteristics of Indonesia's peat ecosystems. The inventory of Indonesia's peat ecosystem has been completed in the form of Peat Hydrological Unit (*Kesatuan Hidrologis Gambut*, KHG)[78] maps, which are to be used as a reference for more detailed mapping at the provincial and district/city levels (see Figure 3.17). These maps show that the total extent of Indonesia's peat ecosystem stand at 24.14 million hectares, of which around 9.16 million hectares are located in Sumatra; 8.39 million hectares in Kalimantan; 60 thousand hectares in Sulawesi; and 6.53 million hectares in Papua.

[78] Keputusan Menteri LHK No. 129/MenIhk/Setjen/PKL.0/2/2017 tentang Penetapan Peta KHG Nasional.



SOURCE: KLHK, 2017j

▶ **FIGURE 3.18** Number and Extent of National Peat Ecosystem Functions (FEG).

In addition, a National Peat Ecosystem Function Map (*Peta Fungsi Ekosistem Gambut*, FEG)[79] has been prepared to serve as a guide for the establishment of plans to manage and protect peat ecosystem (see Figure 3.18).

3.7.3 The rehabilitation of peat ecosystems

After conducting an inventory, the next step is to determine the extent of areas of degraded peatlands to facilitate their rehabilitation. According to the peat ecosystem inventory conducted by the Indonesian Center for Agricultural Land Resources Research and Development (*Balai Besar Penelitian dan Pengembangan*

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

▶ **TABLE 3.10** Damage of Peat Ecosystems by Island

Island area	Damage Status of Peat Ecosystems (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, 2017k

Sumber Daya Lahan Pertanian, BBSDLP) in 2011, which has now been further revised using updated MoEF data, approximately 23.96 million hectares (almost all) of the nation's peat ecosystems can be classified as damaged, with the level of damage ranging from mild, to moderate, to severe and to very severe (see Table 3.10).

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.

The Restoration of Peat Ecosystem in Concession Areas

The restoration of peat ecosystems in concession areas affects businesses operating in 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 points[80] (places where water depths are to be measured manually or automatically), building rainfall monitoring stations, blocking canals (with or without spillways), building of water gates and reservoirs, rehabilitation through replanting with endemic (indigenous) 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 both under the PROPER mechanism and, since 2016, by the Ministry of Environment and Forestry itself.[81]

As of December 2017, 45 HTI companies were involved in the restoration of 1,785,087 hectares of peat ecosystems in their concession areas, located in 115 Peat Hydrological Units, of which 1,105,742 hectares are areas that must be protected (*Fungsi Lindung Ekosistem Gambut*, FLEG) while in 679,345 hectares, cultivation may proceed (*Fungsi Budidaya Ekosistem Gambut*, FBEG). Those 45 HTI companies will establish 3,932 Water Table Compliance

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

[81] Peraturan Menteri LHK No. P.15/MENLHK/SETJEN/ KUM.1/2/2017 tentang Tata Cara Pengukuran Muka Air Tanah di Titik Penaatan Ekosistem Gambut.

Points (*Titik Penaatan Tinggi Muka Air Tanah*, TPTMAT) and equip them with 397 data logger/automatic groundwater level monitoring devices, and 169 rainfall measurement stations (Table 3.11). 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 45 HTI companies, 31 have compiled Peat Ecosystem Restoration Plans (*Rencana Pemulihan Ekosistem Gambut*, RPEG), in which they have agreed to block 3,943 canals (from 2017 to 2026), rehabilitate 21,286 hectares of peatland vegetation, and perform enrich planting and promote natural succession on 518,418 hectares.

In the case of the oil palm plantation sector, 80 companies have conducted TPTMAT determinations covering a total area of 652,295 hectares, located across 74 KHG, of which 302,535 hectares are classified as protected (FLEG) and 349,761 classified as for cultivation (FBEG). Across this expanse 3,115 Water Table Compliance Points have been sited, with 279 data logger/automatic groundwater level monitoring devices, and 244 rainfall monitoring stations. Of these 80 plantation companies, 49 have compiled RPEG documents, covering a total of 278,639 hectares of peat ecosystems, of which 78,286 hectares are classified as protected (FLEG) and 200,353 hectares classified as for cultivation (FBEG).

TABLE 3.11 Restoration of Peat Ecosystems in Industrial Timber and Oil Palm Plantations

	Industrial Plantation Forests	Oil Palm Plantations
Number of companies	45 companies	80 companies
Number of companies that have compiled RPEG	31 companies	49 companies
Peat ecosystems within the concession area	1,785,087 hectares	652,295 hectares
- Peat which must be protected (FLEG)	1,105,742 hectares	302,535 hectares
- Peat on which cultivation may occur (FBEG)	679,345 hectares	349,761 hectares
Number of Peat Hydrological Units (KHG) affected	115 KHG	74 KHG
Number of canals to block (2017 - 2026)	3,943 units	1,037 units
Number of Water Table Compliance Points (TPTMAT)	3,932 points	3,115 points
Number of data logger devices to be set up	397 units	279 units
Number of rainfall monitoring stations to be built	169 units	244 units
Rehabilitation areas:		
- Vegetation rehabilitation	21,286 hectares	-
- Enrichment planting and natural succession	518,418 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)

In 2017, the total number of companies holding concessions on peat ecosystem that have improved their performance in the area of water management through the PROPER mechanism stood at 60, a figure in excess of the 40 companies targeted by the Ministry. In 2016, the number of Peat Hydrological Units (KHG) with improvements in their water management was four KHG, a figure which exceeds the three that had been targeted.

Table 3.12 Number and Extent of IUPHHK HT Concessions in Hydrological Peat Areas

No	Province	Number of HTI	Extent of IUPHHK-HTI (Ha)	Extent of FLEG (Ha)
1	North Sumatra	1	188,055	244
2	Riau	43	1,429,436	741,137
3	Jambi	3	337,626	741,137
4	South Sumatra	12	1,103,010	405,023
5	Bangka Belitung Islands	5	188,137	10,130
6	West Kalimantan	17	1,028,960	152,276
7	Central Kalimantan	8	384,815	3,601
8	East Kalimantan	3	271,870	3.434
9	North Kalimantan	3	253,871	26,594
10	Papua	3	360,645	4,177
11	West Papua	1	99,980	12,438
	Total	99	5,646,405	2,100,190

Notes:

HTI: Hutan Tanaman Industri (Industrial Plantation Forest)

IUPHHK-HTI: 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)

Ninty nine (99) Industrial Plantation Forests (HTI) companies holding rights to land covering 2.59 million hectares (out of 285 HTI concession holders covering a total area of around 10.7 million hectares) have been identified as operating partially or fully on KHG. These 99 companies operate on an area of around 2.1 million hectares of KHG (See Table 3.12).

In addition to submitting a Peat Ecosystem Restoration Plan, HTI companies must also present revised ten-year Business Work Plans (Rencana Kerja Usaha, RKU). In the revised RKU document, 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, cultivation could in theory take place (FBEG). Meanwhile, there are nine ecosystem restoration concessions (IUPHHK-RE) which are located on 332,491 hectares of peat ecosystem. In these nine, areas with good tree stands will be maintained, and areas with no tree stands must be restored by planting endemic species.

Restoration of Peat Ecosystems on Community Land

Village communities play a potentially important role in sustainable peatland management (see Box 3.5). Some communities practice zero burning land management (*pengolahan lahan tanpa bakar*, PLTB), and the development of local commodities, fisheries, livestock, and honey. Villages are expected to be able to contribute in important ways to peat restoration, and development of a sustainable peat-based economy, in accordance with the

general guidelines and regulations issued by relevant Ministries and other institutions.

Communities have made significant progress towards developing peat rewetting infrastructure, including drilling wells, canal blocking, and canal filling. Community peat rewetting activities have been conducted so far in areas covering 270,000 hectares.

These activities have conducted in collaboration between the government, donors, NGOs, universities and communities. The Ministry of Environment and Forestry has also conducted peatland restoration in community-owned areas, blocking 178 canals to facilitate the rewetting of 3,067 hectares of peat ecosystems.

Box 3.5

Best Practices in Peatland Management

Indonesia's peatlands have been utilized since the end of the 19th century. Prior to the 1920s, indigenous Dayak rural communities in South Kalimantan had begun to manage shallow peatlands in the areas behind river banks (back swamps) which they call 'lawau', and which they manage for rain-fed rice fields. River areas are fertile because of the deposition of sediments. Dayak people are environmentally friendly. In managing the land, they have a rotating farming system that always maintains a balance and follows a natural cycle (Suwardi *et al.*, 2005). Dayaks divide the land into zones for settlement, bushes, cultivated paddy fields ('jurungan'), fallow paddy fields ('pahumaan'), plantations, sacred zones, and protected zones ('kayuan'). Sacred zones are Adat protected zones that should not be cleared for agriculture. When agricultural land becomes infertile, Dayaks will move to look for similar land in other places. After being left for 1-7 years the former fields will become bush and after 7-12 years the bush will become a forest. They will reopen the former field after 30 years, when it has become a forest again. This is done in a continuous cycle, sustainably.

In the 1950's, non-indigenous Banjar people also started to access peatland for farming (Suwardi *et al.*, 2005). First, they build a "handil", a main drainage canal which is a slightly higher elevation than the river. Handil are usually an extension of an existing river branch which is excavated and extended to fields up to 4 to 10 km away. Handil are not large: the depth of the canal will usually not exceed one meter, while the width will not exceed two meters. Handil serve as: (1) drainage canals; (2) irrigation canals; and (3) transportation channels. The Banjar also build "parit", secondary canals which are at a slightly higher elevations than the handil. Parit are located at about every 30 meters along the handil. The typical depth and width of the parit 50 cm and 1 m respectively. Using handil and parit, excessive drainage can be prevented, and soil subsidence can be slowed.

The Dayak and Banjar both provide examples of how traditional knowledge and wisdom can be used to manage peatlands sustainably and prevent peat degradation that may lead to fires.

CONTRIBUTOR: DJPPKL, 2018.

3.8 Restoration of Forest Landscapes

Despite the decline in rates of deforestation and forest degradation, the extent of damage to watersheds in Indonesia is still very high, requiring intensive forest and land rehabilitation (*rehabilitasi hutan dan lahan*, RHL) measures. Based on data from the Directorate General of Watershed Management and Social Forestry (*Direktorat Jenderal Bina Pengelolaan Daerah Aliran Sungai dan Perhutanan Sosial,* BPDASPS) in 2013, the total extent of critical land in Indonesia stood at 24.3 million hectares. This included 15.5 million hectares in the Forest Area and 8.7 million hectares of public land outside the Forest Area (APL). Although this was a decline of around 3.3 million hectares from the figure recorded in 2011, when the extent of critical land stood at 27.3 million hectares, rehabilitation activities nevertheless must be intensified, given the large area of critical land that remains.

For the period from 2015 to 2019, the Government set a target of to reduce the extent of critical land by 5.5 million hectares. This is spread across 34 provinces, which are managed through 34 Watershed and Protection Forest Areas Management Offices (*Balai Pengelolaan Daerah Aliran Sungan dan Hutan Lindung*, BPDASHL). However, critical 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 or Production Forest Management Unit (*Kesatuan Pengelolaan Hutan Produksi*, KPHP), or under lease for non-forestry purposes, such as mining, through borrow and use permits (*Izin Pinjam Pakai Kawasan Hutan*, IPPKH). Critical 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/*Areal Penggunaan Lain*, APL), critical 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 the whole 5.5 million hectares in critical lands has been set to 1.25 million hectares/year from 2015 to 2018 and 500 thousand hectares for 2019. The total budget allocated for rehabilitating 5.5 million hectares critical land is IDR 39 trillion or USD 2.9 billion for five years. However, this level of funds is insufficient, and will only pay for the rehabilitation of about 200,000 hectares per year by the Directorate General of Watershed and Protection Forest Management (*Direktorat Jenderal Pengelolaan Daerah Aliran Sungai dan Hutan Lindung*, DJPDASHL) in the Ministry of Environment and Forestry. This leaves no obvious way forward for the rehabilitation of the more than one million hectares of remaining critical lands to be financed out-of-pocket by concessionaires, borrow and use permit holders, KPHP, KSA/KPA, social forestry license holders, local governments and land managers throughout Indonesia.

Since 2017, based on the Ministry of Finance Regulation[82], Revenue Sharing from the Reforestation Fund (*Dana Bagi Hasil Dana Reboisasi*, DBH-DR) has been distributed to provincial and district governments and can 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

[82] 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).

fires prevention and control[83]. A more wide range of activities that can be implemented using DBH-DR for 2018 is also listed in the Act on the National Budget of 2018, and includes forest protection and security, forest and land rehabilitation, prevention and control of forest and land fires, delineation of forest area boundaries, seed development, research and development, education and training, empowerment of communities in forest rehabilitation, facilitation, supervision, monitoring and control, management of Grand Forest Parks, tree planting in critical watershed areas, bamboo planting on riverbanks, and construction of soil and water conservation facilities[84]. The total DBH-DR for 2018 is IDR 1,645,031,286,000 or USD 121,213,308[85].

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 (see Figure 3.19), gully plugs and absorption wells. Based on 2017 data from the Directorate General of Watershed and Protection Forest Management (DJPDASHL), rehabilitation activities were conducted in 34 watersheds in Indonesia covering a total area of 19,482 hectares of Conservation Forest, 1,175 hectares mangroves, beaches, swamps, and peatland, and 164,006 hectares of land rehabilitation from community nurseries (see Table 3.13).

SOURCE: DJPDASHL

▶ **FIGURE 3.19** Check Dam in Cisangkuy, Bandung, West Java.

[83] Peraturan Menteri Keuangan No. 230/PMK.07/2017 tentang Penggunaan, Pemantauan, dan Evaluasi Dana Bagi Hasil Sumber Daya Alam Kehutanan Dana Reboisasi.

[84] Undang-undang No. 15 Tahun 2017 tentang Anggaran Pendapatan dan Belanja Negara Tahun 2018.

[85] http://www.djpk.depkeu.go.id/wp-content/uploads/2017/11/Rincian-Alokasi-TKDD-TA-2018-1.pdf

TABLE 3.13 Rehabilitation of Forest and Land in 34 Watersheds in 2015 – 2017

Type of Area	Area (ha)		
	2015	2016	2017
Conservation/Protection Forests	10,508	7,067	19,482
Mangrove Forests/Beaches/Swamps/Peat	481	497	1,175.4
Urban forest	240	215	452
Agroforestry/Aerial seeding	7,624	13,416	15,875
Land rehabilitation from community nurseries	181,594	177,151	164,006
Total	200,447	198,346	200,990

SOURCE: DJPDASHL, 2017a

In addition to addressing critical land, rehabilitation activities are conducted to prevent and mitigate the impacts of floods and landslides and 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.

Rehabilitation activities are also conducted in areas affected by natural disasters. Rehabilitation activities were conducted in 2017 in the Post-Disaster Areas of Citarum Ciliwung, Cimanuk Citanduy and Dodokan Moyosari watershed areas in West Java and West Nusa Tenggara. These activities consisted of conventional rehabilitation, aerial seeding and water conservation construction works (see Table 3.14).

TABLE 3.14 Post-Disaster Forest and Land Rehabilitation Activities in 2017

No.	Watershed management area	Activity			
		Conventional Forest and Land Rehabilitation (Ha)	Aerial seeding (Ha)	Retaining Dam (Unit)	Gully Plug (Unit)
1.	Citarum Ciliwung, W. Java	4,400	8,000	34	182
2.	Cimanuk Citanduy, W. Java	1,164	5,400	100	157
3.	Dodokan Moyosari, E. Nusa Tenggara	100	-	70	105
	Total	5,664	13,400	204	444

SOURCE: DJPDASHL, 2017b

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 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 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 this ecosystem restoration development are: to maintain forest functions (the status of the forest area); to ensure forest protection and maintenance (conservation); to restore the levels 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. Ecosystem restoration also plays an important role in carbon emission reduction as well as increasing carbon stocks. Ecosystem restoration activities also include rehabilitation, increasing biomass, and protection from forest fires.

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 involve a multiple range of businesses, such as area utilization (for example, ecotourism), non-timber forest products and environmental services, that can be implemented prior to reaching of full ecosystem balance.

The achievement of planting activities in natural forest, HTI, and ecosystem restoration concession areas, as well as areas managed by KPHPs is presented in Table 3.15.

TABLE 3.15 Hectares planted in trees in production forest areas (2015 to 2017)

	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	15,948	206,757	3,477	233

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

3.8.3 Ecosystem restoration in Conservation Area

Of the 24.3 million hectares of critical land in Indonesia, approximately 2 million hectares is in Conservation Area[86]. 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 forests but is also 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 mechanisms[87], ecosystem rehabilitation[88], and ecosystem restoration[89], as guided in the Minister of Forestry Regulation on the Procedures of Implementing Ecosystem Restoration in Sanctuary Reserve Areas and Nature Conservation Areas[90].

Ecosystem restoration in Conservation Area has been dealing with various obstacle, including lack of funding, lack of tools and facilities, lack of technical skills, lack of partners, etc. Therefore, ecosystem restoration in Conservation Area has used different approaches than those used in Protection and Production Forests as well as in other ecosystem restoration programs outside Forest Area. The approach in Conservation Area is through partnerships with stakeholders, especially local communities dwelling in or at the fringe of Conservation Area. Local communities who at one time considered as "encroachers" are now seen as partners in ecosystem restoration in Conservation Area. Although still small in number, out of 552 terrestrial and marine Conservation Areas in Indonesia, there are 13 which have shown success in ecosystem restoration using this new approach. Table 3.16 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.

[86] DJKSDAE, 2017.

[87] 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.

[88] 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.

[89] 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.

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

TABLE 3.16 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: DJSKDAE, 2017

Mountain climbers and Gunung Ciremai National Park team was celebrating Indonesia's Independence day at Gunung Ciremai peak, at 3,078 meters above sea level.

LOCATION
The peak of Gunung Ciremai at Gunung Ciremai National Park, West Java Province

PHOTO BY
Gunung Ciremai National Park

CHAPTER 4

Involvement of Communities in Forest Management

4.1 Provision of Access to Communities through Social Forestry

There are 25,863 villages that are closely related to 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.[91] 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 2015, the Indonesian Human Development Index stood at 0.689, placing Indonesia below the mid-point, at 113th out of 188 countries and territories. As of March 2017, the Gini coefficient stood at greatly-improved 0.42.[92] These figures show that Indonesia's poverty rate can be addressed, and that inequality is declining.

Social Forestry is intended to provide communities with legal access to utilize forest resources. Prior to the 1990, communities living in and around forests were not regarded as having the potential and capacity to play a significant role in the management of forests but 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 be given rights and access to forest resources in a way that is empowering.

In the period from 2007 to 2013, a range of regulations were promulgated to support the role of communities in forest management, with regulations related to Community Forests (HKm),[93] Village Forest (HD),[94] Forestry Partnerships (*Kemitraan Kehutanan*),[95] and Community Plantation Forest (HTR) [96] . All are forms of empowerment. In the period from 2007 to 2014, 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 449,104 hectares, of which of 78,072 hectares were HD, 153,725 hectares were HKm, 198,595 hectares were HTR, and 18,712 hectares were Forestry Partnership.

Under the administration of President Jokowi, social forestry has been much more

[91] Wiratno, 2017.

[92] Central Bureau of Statistics (*Badan Pusat Statistik*), March 2017

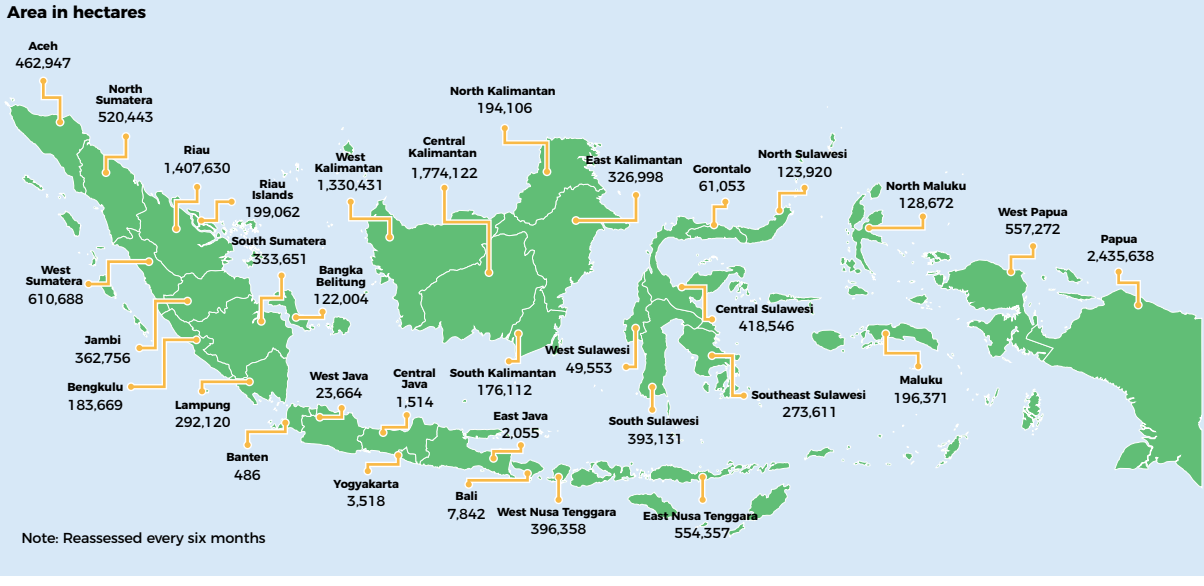
[93] Peraturan Menteri Kehutanan No. P.37/Menhut-II/2007 tentang Hutan Kemasyarakatan.

[94] Peraturan Menteri Kehutanan No. P.49/Menhut-II/2008 tentang Hutan Desa.

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

[96] 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.

oriented toward community welfare. The 2015 to 2019 target set by the National Medium-Term Development Plan (RPJMN) for the awarding of Social Forestry licenses is 12.7 million hectares, with targeted areas defined by the Indicative Map of Social Forestry Areas (*Peta Indikatif Areal Perhutanan Sosial*, PIAPS).[97] The PIAPS map (see Figure 4.1) can be viewed at http://sinav.perhutanan-sosial.id/main/piaps. *Adat* forests aim to improve the community welfare of indigenous communities who living in and around forest areas. There is a hope and belief that in *Adat* forests, approaches are based on local wisdom (*kearifan lokal*), such as the ecotourism practices of the Kalibiru people in Kulon Progo District, *adat* fishing techniques in the *nagari* forest in West Sumatra, and the application of *Adat* Law for the removal of non-timber forest products from the Ammatoa Kajang *Adat* Forest in Bulukumba, South Sulawesi.

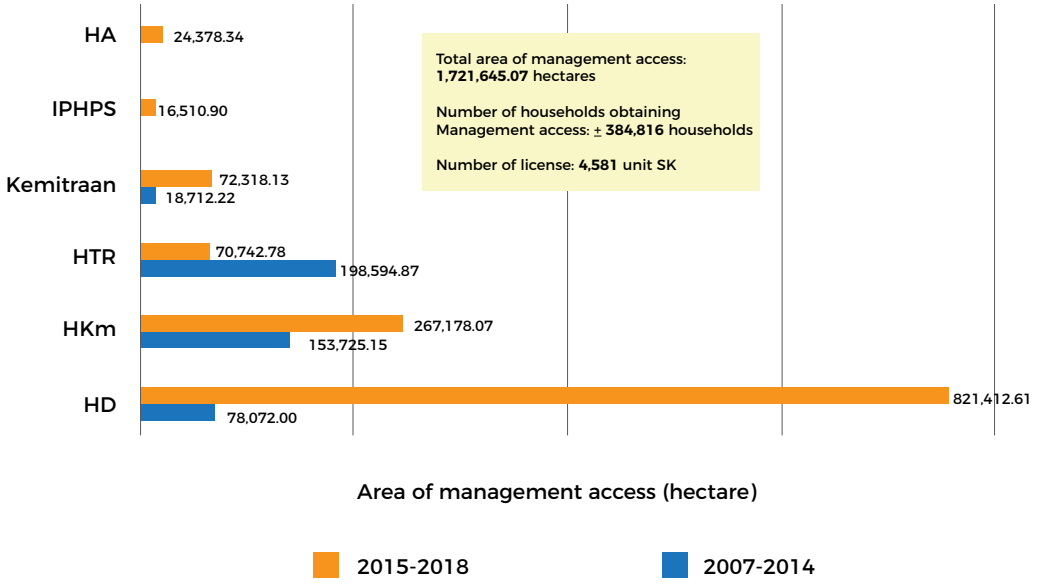


SOURCE: KLHK, 2017l

▶ **FIGURE 4.1** Indicative Map of Social Forest Areas, Revision 1

[97] Keputusan Menteri LHK No. SK.4865/MENLHK-PKTL/REN/PLA.0/9/2017 tanggal 25 September 2017 tentang Peta Indikatif dan Areal Perhutanan Sosial.

The recorded achievements of the Social Forestry program have increased significantly over the past three years (2015 to 2018). Over this period, permits issued to enable communities to manage forests have increased 1,272,540.83 hectares, of which 821,412.61 hectares are for HD, 267,178.07 hectares are for HKm; 70,742.78 hectares are HTR; 72,318.13 hectares are for Forestry Partnerships; 16,510.90 hectares are Social Forestry Utilization Permits (IPHPS); and 24,378.34 hectares[98] are *Adat* Forests. Most of the increase occurred in the final year of this period, when Social Forestry licenses were awarded, largely as a result of the promulgation of new regulations on Social Forestry[99] (See Figure 4.2 below).



Notes

HD - *Hutan Desa* (Village Forest)
HKm - *Hutan Kemasyarakatan* (Community Forest)
HTR - *Hutan Tanaman Rakyat* (Community Plantation Forest)
Kemitraan - *Kemitraan Kehutanan* (Forestry Partnership)
IPHPS - *Izin Pemanfaatan Hutan Perhutanan Sosial* (Forest Utilization Permit for Social Forestry)
HA - *Hutan Adat* (*Adat* Forest)*
HHs – Households

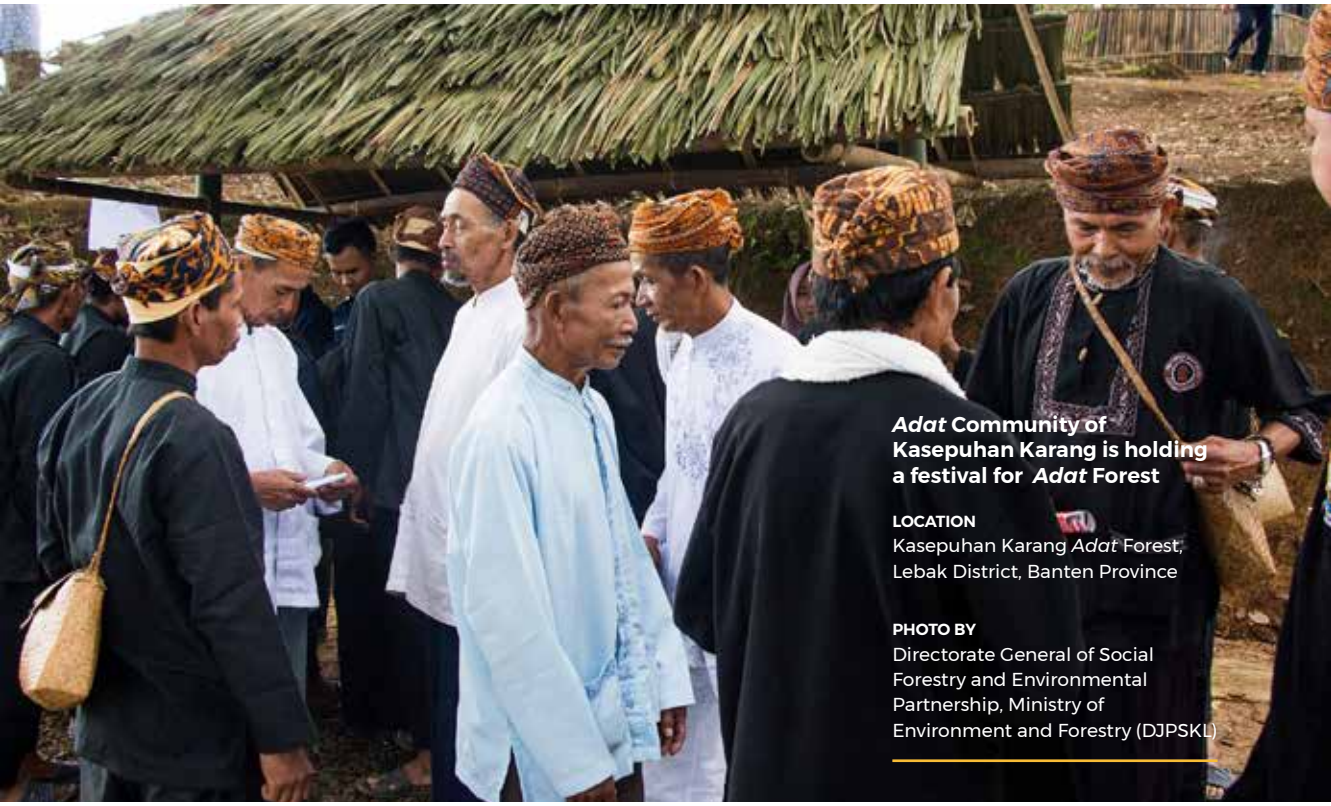
*This area includes customary forests that are formally stipulated, in the process of being stipulated, and in the pipeline.

SOURCE: KLHK, 2018K

▶ **FIGURE 4.2** Social Forestry Access as of June 2018

[98] This area is *adat* forest area that has been stipulated, in the process of stipulation, and in the pipeline for *adat* forest.

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



***Adat* Community of Kasepuhan Karang is holding a festival for *Adat* Forest**

LOCATION
Kasepuhan Karang *Adat* Forest, Lebak District, Banten Province

PHOTO BY
Directorate General of Social Forestry and Environmental Partnership, Ministry of Environment and Forestry (DJPSKL)

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 Rights Forests[100], and the Ministry of Environment and Forestry Regulation on Forest Land Tenure Conflict Management[101]. A Ministry of Environment and Forestry Regulation on Social Forestry in Perhutani Working Areas[102] 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 Lampung, community forests in Sikka District, Nusa Tenggara Timur, the Kalibiru Community Forest (see Box 4.1), the Namo Village Forest, the Bentang Pesisir Padang Tikar Village Forest (see Box 4.2), the Ammatoa Kajang *Adat* Forest (see Box 4.3), and the Forestry Partnership in Teluk Jambe.

[100] Peraturan Menteri LHK No. P.32 Tahun 2015 tentang Hutan Hak.

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

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

Box 4.1

The Kalibiru Community Forest, Yogyakarta

The Kalibiru Community Forest (HKm) is located in the village of Hargowilis, in the District of Kulon Progo, Yogyakarta. It has taken almost 20 years to ensure the success of HKm Kalibiru, with the process involving micro-technical to macro-policy measures, with the participation of a wide range of stakeholders, with the principal role being played by community members and local residents.

As with most communities living in areas adjacent to the forest land, the socio-economic life of the community in Hargowilis is heavily dependent on forest resources, both directly to meet the basic needs and indirectly as a source of capital for other business activities to improve their income. Based on a number of studies, it appears that approximately 38.82 percent of community members' incomes are derived from forest resources, with these resources including firewood, medicinal plants, honey and fruits and others.

Efforts to diversify sources of livelihood outside the forestry sector have been conducted. Hargowilis is located 40 km from Yogyakarta in a hilly region with poor infrastructure, which creates challenges for community members' participation in productive enterprises, due to the imbalance between sales prices and production costs. Livelihood diversification efforts have been conducted as a means to increase resilience to economic and environmental shocks and to enable community members to escape the poverty cycle. Challenges include the generally low level of education, limited skills, and lack of access to finance. However, through a lengthy process of negotiation with intensive facilitation from NGOs and local governments, ecotourism initiatives are now emerging, with some degree of success.

CONTRIBUTOR: Directorate General of Social Forestry and Environmental Partnerships, 2018

Box 4.2

The Bentang Pesisir Padang Tikar Village Forest (HD), Kubu Raya District, West Kalimantan

The Bentang Pesisir Padang Tikar Village Forest (HD) is located in the village of Padang Tikar 1, Batu Ampar Subdistrict, Kubu Raya District, West Kalimantan. It has adopted agroforestry systems to cultivate a Village Forest of 190 hectares, with the involvement of around 2196 individuals. The community benefits directly from the cultivation of commodities such as mangrove honey, trigona honey, mangrove and nypa syrup, nypa flour, peat coffee, tamarind acids, swetened-dried bananas, shrimp crackers, charcoal derived from coconut shell, and copra. Not only has the community benefited economically from these initiatives, but these initiatives also support environmental sustainability.

Social forestry provides equal opportunity with income improvement 16.04 times than previously, e.g. IDR 2.5 million/month to IDR 40.1 million/month.

The value derived from 3 years forward projection from the process of silvofishery development (crab cage), *kelulut* bee cultivation, and waste utilization of coconut shell charcoal.

CONTRIBUTOR: Directorate General of Social Forestry and Environmental Partnerships, 2018

Box 4.3

The Ammatoa Kajang Adat Forest

The Ammatoa Kajang *Adat* Forest is managed by the *Kajang* community, a traditional group that holds strong beliefs that the earth is an inheritance provided to them by their ancestors. They believe that it is their duty to pass on this inheritance in the same state that they received it to their descendants. The Ammatoa Kajang community has been able to maintain and preserve the forest ecosystem sustainability and to ensure that it remains in a relatively stable condition. This is a vital step towards maintaining forest ecosystems, and ensuring the continuity of water supplies.

According to the traditional culture of the Ammatoa Kajang community, the forest can be divided into three categories: the sacred or Karamaka forest; the border or Batasayya forest; and the community or Laura forest. No activities except ritual activities are permitted in the sacred forest, with members of the community highly protective of this area. The border forest can be utilized to harvest timber, although only with the permission of the Ammatoa. Timber taken from this forest can only be used to build public facilities or homes for poor members of the Ammatoa Kajang community.

Sanctions for violations of the *adat* law are strictly enforced, with sanctions ranging from financial penalties to exclusion from the Kajang community. The Ammatoa, or *Adat* leader, is supposed to emulate the community's *Bu'rung* tree, which towers high and branches far. Like this tree, the *Adat* leader should be straight, firm and steadfast. The daily life of the community is regulated by laws that require all community members to achieve a balance between spiritual and economic interests. In general, their *Adat* beliefs emphasize simplicity and lack of ostentation.

CONTRIBUTOR: Directorate General of Social Forestry and Environmental Partnerships, 2018

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 serve as the front guard for the acceleration of Social Forestry at the grass roots level. Currently, 26 POKJA PPS have been established throughout Indonesia and a 2018 budget for operations has been allocated.

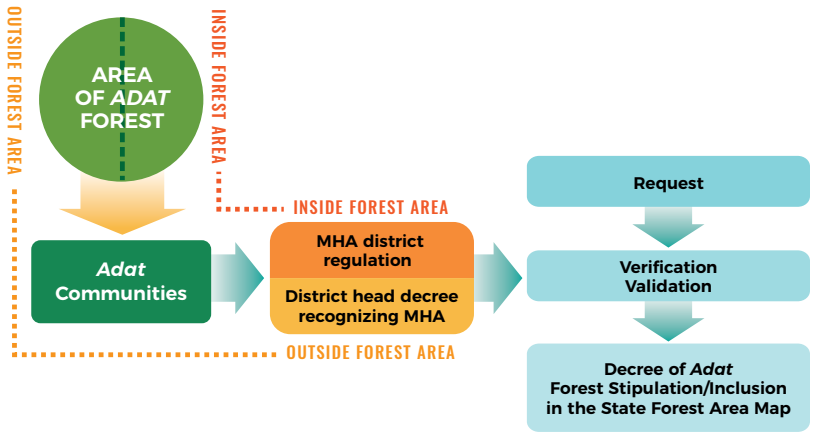
Other notable efforts to support social forestry are the work of the Social Forestry Community Business Group, and the application of the mechanism of *detasering* to accelerate social forestry. *Detasering* in the local government context means facilitating access to forests for communities and assisting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

4.2 Recognition of *Adat* Forest

Adat Forest is a social forestry scheme wherein the forest is located in an *Adat* Law Community's area. According to the Forestry Act,[103] *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*).[104] In recognition of the Constitutional Court's decision, the Ministry of Environment and Forestry issued a regulation concerning Rights Forests in 2015[105].

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 (see Figure 4.3). 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 it's function. The extent of designated *Adat* Forest will be based on the capacity of the 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 pemitted to cut trees, but only



SOURCE: KLHK, 2017m

▶ **FIGURE 4.3** Processes of Recognition of MHA and *Adat* Forests

[103] Undang-Undang Republik Indonesia No. 41 Tahun 1999 tentang Kehutanan.

[104] Putusan Mahkamah Konstitusi No. 35/PUU-X/2012 tentang Tanah Hak Ulayat Masyarakat Hukum Adat.

[105] Peraturan Menteri LHK No. P.32/Menlhk-Setjen/2015 tentang Hutan Hak.

The Verification Process of Kulawi *Adat* Forest in Marena, Sigi District, Central Sulawesi Province.

LOCATION
Sigi District, Central Sulawesi Province.

PHOTO BY
Dit. PTKHA

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 Rights Forests,[106] Article 9, Paragraph (1), which states that the transfer of rights to land stipulated as a Rights Forest area shall not result in changes to the function of the forest without the Minister's formal and explicit consent.

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. As of June 2018, there were 26 recognized *Adat* Forests across Indonesia, located in Jambi, Central Sulawesi, South Sulawesi, West Kalimantan, Banten, West Java and East Kalimantan provinces. This includes 21 *Adat* Forests whose status has been stipulated, covering a total area of 11,577 hectares; five *Adat* Forests which are currently in the process of being stipulated, covering an area of 2,174 hectares; and two *Adat* Forests are still in the pipeline, covering an area of 10,627 hectares (see Table 4.1).

[106] Peraturan Menteri LHK No. P.32/Menlhk-Setjen/2015 tentang Hutan Hak.

TABLE 4.1 *Adat* Forests formally stipulated, or in the stipulation process, as of June 2018

No	Name of *Adat* Forest	Location	Area (±Ha)
A	***Adat* Forests in the pipeline**		
1	Tombak Haminjon[a]	Pandumaan and Sipituhuta Villages, Pollung Subdistrict, Humbang Hasundutan District, North Sumatra	5,172
2	Forests prioritizing the development needs of the Suku Anak Dalam community group[a]	Sorolangun and Batanghari Districts, Jambi	5,455
B	***Adat* Forests in the process of being stipulated**		
1	Nenek Limo Hiang Tinggi Nenek Empat Betung Kuning Muara Air Dua	Hiang Tinggi, Hiang Karya, Hiang Sakti and Betung Kuning Hiang Villages, and Sitinjau Laut Subdistricts, Kerinci District, Jambi	645
2	Hulu Air Lempur Lekuk Limo Puluh Tumbi	Baru Lempur, Lempur Mudik, Manjuto Lempur, Lempur Tengah, and Lempur Hilir Villages, and Gunung Raya Subdistricts, Kerinci District, Jambi	745
3	Marena	Pekalobean & Singki Villages, Angeraja Subdistrict, Enrekang District, South Sulawesi	150
4	Orong	Buntu Bantaun & Rante Mario Villages, Malua Subdistrict, Enrekang District, South Sulawesi	40
5	Baringin	Baringin Village, Maiwa Subdistrict, Enrekang District, South Sulawesi	594
C	**Formally stipulated as *Adat* Forests**		
1	Bukit Sembahyang and Bukit Padun Gelanggang[b]	Air Terjun Village, Siulak Subdistrict, Kerinci District, Jambi	39
2	Bukit Tinggai[b]	Sungai Deras village, Air Hangat Subdistrict, Kerinci District, Jambi	41
3	Tigo Luhah Permenti Yang Berenam[b]	Pungut Mudik Village, Air Hangat Subdistrict, Kerinci District, Jambi	276
4	Tigo Luhah Kemantan[b]	Villages of Kemantan Kabalai, Kemantan Tinggi, Kemantan Mudik, Kemantan Raya, Kemantan Agung, Air Hangat Timur subdistrict, Kerinci District, Jambi	452
5	Marga Serampas[b]	Rantau Kermas Village, Jangkat Subdistrict, Merangin District, Jambi	130
6	Ammatoa Kajang[b]	Villages of Tana Towa, Pattiroang, Bonto Baji and Malleleng, Kajang Subdistrict, Bulukumba District, South Sulawesi	314
7	Wana Posangke[b]	Taronggo Village, Bungku Utara Subdistrict, Morowali Utara District, South Sulawesi	6,212

No	Name of *Adat* Forest	Location	Area (±Ha)
8	Kasepuhan Karang[b]	Jagaraksa Village, Muncang Subdistrict, Lebak District, Banten	486
9	Tawang Panyai[c]	Tapang Semadak Village, Sekadau Hilir Subdistrict, Sekadau District, West Kalimantan	41
10	Marena[c]	Marena Village, Kulawi Subdistrict, Sigi District, Central Sulawesi	756
11	Hemaq Beniung[c]	Juaq Asa village, Borong Tongkok Subdistrict, Kutai Barat District, East Kalimantan	49
12	Bukit Bujang[c]	Dusun Senamat Ulu Village, Batin III Ulu Subdistrict, Bungo District, Jambi	223
13	Belukar Panjang*[c]	Dusun Batu Kerbau Village, Pelepat Subdistrict, Bungo District, Jambi	326
14	Batu Kerbau[c]	Dusun Batu Kerbau Village, Pelepat Subdistrict, Bungo District, Jambi	323
15	Rimbo Penghulu Depati Gento Rajo[c]	Pulau Tengah Village, Jangkat Subdistrict, Merangin District, Jambi	525
16	Bukit Pintu Koto[c]	Ngaol Village, Tabir Barat Subdistrict, Merangin District, Jambi	278
17	Baru Pelepat[c]	Baru Pelepat Village, Pelepat Subdistrict, Bungo District, Jambi	821
18	Rimbo Bulim[d]	Rambah Village, Tanah Tumbuh Subdistrict, Bungo District, Jambi	40
19	Imbo Larangan Pematang Kulim and Imbo Larangan Inum Sakti[d]	Temenggung Village, Limun Subdistrict, Sarolangun District, Jambi	115
20	Pikul[d]	Sahan Village, Seluas Subdistrict, Bengkayang District, West Kalimantan	100
21	Leuweng Gede[d]	Kuta Hamlet, Karangpaningal Village, Tambaksari Subdistrict, Ciamis District, West Java	31
		Total	**24,378.34**

Notes: [a] Included in the pipeline in 2017; [b] formally stipulated in 2016; [c] formally stipulated in 2017; [d] formally stipulated in 2018; * *adat* protection forest.

SOURCE: KLHK, 2018l

Progress in the area of *Adat* Forests is being achieved. Althought this was not always easy, open discussions are now taking place between the government (MoEF), sub-national governments and representatives of *Adat* communities. The results of those discussions have to be continuously followed up. The recognition of *Adat* Forests is now accelerating. A hundred and fifty-two (152) claims had been made on 2.25 million hectares of *Adat* Forest, as of January 2018.

In order to accelerate the recognition of *Adat* Forests, identification of potential forests and technical reviews will be conducted, based on *Adat* forest candidates having been put forward by the *Adat* Area Registration Board (*Badan Registrasi Wilayah Adat*, BRWA), and followed up by stakeholder meetings. Candidates will undergo verification processes, and these may result in the stipulation of new areas *Adat* Forest.

PHOTO BY
Directorate General of Social Forestry and Environmental Partnership, Ministry of Environment and Forestry (DJPSKL)

4.3 Protection Forest Management with the Participation of Communities

Forest Management Unit (*Kesatuan Pengelolaan Hutan*, KPH) are the most devolved units 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 those found in the Rinjani Barat Protection Forest Management Unit, in West Nusa Tenggara province (Box 4.4) and the Batu Tegi Protection Forest Management Unit in Lampung province (Box 4.5).

Box 4.4

Protection Forest Management Unit (KPHL) Unit I, Rinjani Barat, West Nusa Tenggara

Located in close proximity to one of Lombok's major tourist destinations, KPHL Unit I Rinjani Barat is developing nature-based tourism initiatives for visitors to West Nusa Tenggara. Sesaot Protection Forest is located 5 km north of Surnandi, Narmada District, West Lombok, NTB. Since 2015, KPHL Rinjani Barat has worked with the community in Sesaot Village to form a partnership involving all stakeholders to develop the area's tourism potential, including Sesaot Spring, Aiknyet Spring, and Buwun Sejati.

In addition to developing ecotourism in Sesaot Village, the KPHL Rinjani Barat has involved local businesses within an area covering around 109 hectares. Elsewhere, the management of the Ranget forest has been conducted in cooperation with Ranget Forum, the local vocational school, and in partnership with a tourism company to utilize the nature-based tourism in Malaka and Senggigi villages, covering an area of 175 hectares.

In order to also provide community members with access to forest resources, the KPHL has cooperated with surrounding communities to facilitate the utilization of non-timber forest products, including patchouli (*nilam*), coffee, cocoa, trigona honey, cajuputi, rubber, candlenut (*kemiri*), palm sugar, agarwood (*gaharu*), and bamboo. This has been achieved in cooperation with a community-based multipurpose business group known as "Kompak Sejahtera" of Rempek/Gangga village on an area of 2,000 hectares. Cooperation to utilize non-timber forest products has also been implemented with community stakeholders in Pemenang Barat village-Pemenang.

CONTRIBUTOR: Directorate General of Watershed Management and Protection Forests, 2018

Box 4.5

Protection Forest Management Unit IX, Batu Tegi, Lampung Province

Palm sugar is one non-timber forest product that communities prefer. Protection Forest Management Unit (KPHL) IX Batu Tegi has been facilitating communities in the utilization of palm sugar because it is easy to produce and trade, and can be processed further as a food raw material. KPHL Batu Tegi also mixed the palm sugar with ginger, and the product is called Guarje.

Palm sugar is sold in a small cilindrical form, so it is easy to be distributed for consumption. Ginger as the main material of Guarje is cultivated inside the forest area and sold at the price of IDR 6,000 per kg. Guarje processing is done manually. Besides palm sugar and ginger, KPHL Batu Tegi also has potential for forest honey, nutmeg, cocoa, bamboo, avocado, candlenut, *petai*, *jengkol*, clove, pepper, jackfruit, rubber, *durian* and coffee. KPHL Batu Tegi developed partnerships with communities in the collection and utilization of non-timber forest products.

In addition to non-timber forest products, KPHL Batu Tegi holds potential for environmental services and nature tourism or, in the case of Batu Tegi dam, both. The lake behind Batu Tegi dam is a source of drinking water for Bandar Lampung, the provincial capital. The dam produces hydroelectric power. The site is also a tourist attraction. KPHL Batu Tegi is spread across Lampung Barat, Lampung Tengah, and Tanggamus Districts.

CONTRIBUTOR: Directorate General of Watershed Management and Protection Forests, 2018

A view in Rinca Island, Komodo National Park.

LOCATION
Komodo National Park

PHOTO BY
Simon Onggo

CHAPTER 5

A New Paradigm for Conservation Area Management

Indonesia has 552 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, with the remaining 22.1 million hectares classified as terrestrial Conservation Forest. The majority of this area (59.79 percent) is designated as National Parks. Some conservation areas have been recognized globally, with four World Heritage sites; eleven Biosphere Reserves; four ASEAN Heritage sites and seven Ramsar sites. This global recognition is evidence of the significant value of Indonesia's forests to the world. Other conservation areas include approximately 4.25 million hectares of strict nature reserve (Cagar Alam, CA); 4.98 million hectares of wildlife sanctuary (*Suaka Margasatwa*, SM); 306.06 thousand hectares of sanctuary reserve area/nature conservation area (*Kawasan Suaka Alam/Kawasan Pelestarian Alam*, KSA/KPA); 16.52 million hectares of National Parks (*Taman Nasional*, TN), 830 thousand hectares of nature recreation park (*Taman Wisata Alam*, TWA); 171.25 thousand hectares of hunting park (*Taman Berburu*, TB), and 371.12 thousand 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)[107].

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 "Island Ecosystem" phenomenon. A study conducted by the Ministry of Environment and Forestry identified an open area of around 2.2 million hectares on 22.1 million hectares of Conservation Forests. These open areas were the result of fires as well as encroachment for plantations, dryland farming, illegal logging, and illegal mining.[107] Working with key stakeholders nearby

[107] Wiratno, 2018.

The Turtle

LOCATION
Teluk Cendrawasih National Park, West Papua Province

Conservation Forest such as villagers, private sectors, CSOs and local universities is the new approach. Putting communities as the key partner is very important to identify problems or potency of conservation forest and develop common goals and implement it together in a collaborative way. There are three principles of collaborative management comprising mutual respect, trust, and benefit. This approach can help conservation forest managers improving their relationship with local communities. Problems such as encroachment, illegal logging and poaching can be solved through dialogues, raising awareness and initiation of possible win-win solution through alternative activities such as the management of non-timber forest products, the restoration of degraded area, the development of ecotourism, the development of mini hydro, and the creation of other small-scale enterprises based on local community empowerment. This requires strong leadership at all levels to guarantee that management can be more open-minded and be more inclusive to a new innovation.

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 relationship between local community and conservation forest. When the local community supports the management, this is the indication of improved collective

awareness and it can be considered as initial success in building social capital. When local community obtaining benefits from conservation forest, they will guard and treat them as their assets that has to be protected and managed wisely. Local wisdoms of community, including *Adat* Community, are in fact in line with the spirit of modern conservation concepts. Thus, there is no reason for not working hand in hand with local communities in 6,381 villages nearby conservation forests across the country. The objective of this system is to improve the effectiveness of the area management.[108] 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. Figure 5.1 shows examples of the implementation of RBM in Alas Purwo National Park.

5.2 The Management of Plants and Wildlife

Indonesia has established targets to increase the populations of 25 endangered species listed on the International Union for the Conservation of Nature (IUCN) Red List of Threatened Species by at least 10 percent from a baseline population levels recorded in 2013. The Ministry of Environment and Forestry has followed this up with a roadmap for the achievement of these targets.[109] Wildlife and natural plant species will be increased in part through breeding programs and propagation. The list of 25 endangered wildlife species is presented in Table 5.1.

SOURCE: Alas Purwo National Park, 2012

▶ **FIGURE 5.1** Implementation of Resort-Based Management (RBM) in Alas Purwo National Park

[108] Permenhut No. P.3/Menhut-II/2007 pasal 31 ayat (1): untuk meningkatkan efektifitas pengelolaan wilayah pada Balai Taman Nasional Tipe B dapat ditetapkan Resort Pengelolaan Taman Nasional Wilayah.

[109] Keputusan Dirjen KSDAE No. 180/IV-KKH/2015 tentang Penetapan 25 Species Satwa Terancam Punah Prioritas untuk Ditingkatkan Populasinya Sebesar 10 percent pada Tahun 2015-2019.

TABLE 5.1 List of 25 endangered wildlife species prioritized for conservation

No.	Wildlife Species	Scientific name
1	Sumatran tiger	*Panthera tigris sumatrae*
2	Sumatran elephant	*Elephas maximus sumatrensis*
3	Javan & Sumatran rhinoceros	*Rhinoceros sondaicus* dan *Dicherorhinus sumatrensis*
4	Banteng	*Bos javanicus*
5	Gibbon and Siamang	*Hylobates* sp. and *Symphalangus sindactylus*
6	Orangutan	*Pongo* sp.
7	Proboscis monkey	*Nasalis larvatus*
8	Komodo dragon	*Varanus komodoensis*
9	Bali myna	*Leucopsar rothschildi*
10	Maleo	*Macrocephalon maleo*
11	Hairy babirusa	*Babyrousa babyrussa*
12	Lowland anoa and Mountain anoa	*Bubalus depressicornis* and *B. quarlesi*
13	Javan Hawk-eagle and Flores Hawk-eagle	*Nisaetus bartelsi* and *Nisaetus floris*
14	Cockatoo	*Cacatua* sp.
15	Javan Leopard	*Panthera pardus melas*
16	Bawean deer	*Axis kuhlii*
17	Bird of Paradise	*Paradisaea* sp. and *Seleucidis melanoleuca*
18	Surili	*Presbytis fredericae* and *Presbytis comata*
19	Tarsier	*Tarsius fuscus*
20	Celebes crested macaque and Celebes macaque	*Macaca nigra* and *Macaca maura*
21	Sumba hornbill	*Rhyticeros everetti*
22	Purple-naped lory	*Lorius domicella*
23	Hawksbill Turtle and Green Turtle	*Eretmochelys imbricata* and *Chelonia mydas*
24	Dingiso	*Dendrolagus mbaiso*
25	Rinjani scops owl	*Otus jolandae*

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 facilitate the rescue, rehabilitation and release of wildlife illegally held in captivity. Increases to the population have also been achieved through birth, either in their natural habitat (*insitu*) or in captivity (*exsitu*).

In 2017, there were nine recorded births of endangered wildlife species, including two tarsiers (*Tarsius fuscus*) in Bantimurung Bulusaraung National Park (South Sulawesi), one anoa (*Buballus* sp.) under the supervision of the Natural Resources Conservation Office (BKSDA) of North Sulawesi, one female Sumatran elephant (*Elephas maximus sumatrensis*) at the Conservation Response Unit in Trumon, Aceh, three female Sumatran elephants and one male Sumatran elephant (*Elephas maximus sumatrensis*) in Way Kambas National Park, Lampung, and one female Sumatran orangutan (*Pongo abelii*) in Jantho Recreation Forest Area, Aceh. Figure 5.2 depicts a newly born of Rhino calf.

In addition to the good news of these births, a new species, the Tapanuli orangutan (*Pongo tapanuliensis*), was discovered (see Box 5.1). Also, a tree species that was believed to be extinct, the *Dipterocarpus cinereus*, was rediscovered in Pulau Mursala, Tapanuli Tengah District, North Sumatra.

▶ **FIGURE 5.2** A newly born of Sumatran Rhino calf (*Dicerorhinus sumatrensis*) ini Way Kambas National Park.

Box 5.1

The Discovery of the Tapanuli Orangutan (*Pongo tapanuliensis*)

As a result of cooperation between the National University (*Universitas Nasional*), the Bogor Agricultural University (*Institut Pertanian Bogor*), the Indonesian Institute of Sciences (*Lembaga Ilmu Pengetahuan Indonesia*), the University of Zurich (Switzerland), and the Sumatran Orangutan Conservation Program of the Sustainable Ecosystem Foundation (*Yayasan Ekosistem Lestari*) over the past eight years, a new species of orangutan, known as the "Tapanuli Orangutan" (Latin name: *Pongo tapanuliensis*) has recently been identified. This new species is found only in the Batang Toru Ecosystem, which stretches across highland forests in three districts of North Sumatra.

Initially, the Orangutan Tapanuli was considered to be the southernmost branch of another Sumatran orangutan species, *Pongo abelii*. In 2015, a study of genetic material (the single nucleotide polymorphisms in the D-loop region of mitochondrial DNA and microsatellite-specified alleles), found that the orangutan in the Batang Toru had significant genetic differences from the *Pongo abelii* found in the area north of Lake Toba, justifying the designation of a new sub-species (*Pongo abelii tapanuliensis*).

However, following an in-depth study conducted by Indonesian and foreign research groups with expertise in the fields of genomics, morphology, ecology, and behaviour, it was found that the population of orangutans in the Batang Toru Ecosystem was taxonomically closer to the Bornean orangutan (*Pongo pygmaeus*), with significant differences from *Pongo abelii*. Thus, the designation of a distinct new species was justified, and it was renamed *Pongo tapanuliensis*.

Pongo tapanuliensis

CONTRIBUTOR: Directorate General of Natural Resources and Ecosystems Conservation, Ministry of Environment and Forestry, 2018.

PHOTO BY: Maxime Aliaga, 2017.

Regarding plant species, Indonesia will propose a change to the status of the *Dipterocarpus cinereus*, which was declared extinct by the IUCN in 1998. A change to this status is being requested due to the rediscovery of the species as a result of exploration and research activities conducted on Pulau Mursala, North Sumatra, by a research team of the Center of Forest Research and Development of the Ministry of Environment and Forestry[110]. In an effort to protect and safeguard the *Dipterocarpus cinereus*, the Ministry and LIPI will strive to ensure that the area containing the habitat of the species is designated as an Essential Ecosystem Zone (*Kawasan Ekosistem Esensial,* KEE) or Special Purpose Forest Area (*Kawasan Hutan Dengan Tujuan Khusus*, KHDTK). Other activities will incude socialization of the existence of this species amongst the relevant institutions, development of a demonstration plot, and habitat protection.

For the 25 endangered species whose populations Indonesia has sought to increase by 10 percent by 2019, average increases from 2015 to 2016 were 2.91 percent, and from 2016 to 2017 were 5.41 percent.[111] The population of 19 priority species have increased by more than 10 percent (Sumatran elephant, rhinoceros, gibbon and siamang, orangutan, proboscis monkey, komodo dragon, Bali myna, maleo, hairy babirusa, Javan hawk-eagle, cockatoo, leopard, Bawean deer, surili, tarsier, Celebes crested macaque, Sumba hornbill, purple-naped lory, and rinjani scops owl). Wildlife species for which rates of increase were lower than 10 percent were the Sumatran tiger, banteng, bird of paradise and dingiso. Unfortunately, the populations of anoa and turtles declined[112].

5.3 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 fringes of the Forest Area.[113] There are 6,381 villages 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.

[110] Center of Forest Research and Development, Forestry Research, Development, and Innovation Agency, Ministry of Environment and Forestry.

[111] Data from the Directorate of Biodiversity Conservation, 2017

[112] DJKSDAE, 2018.

[113] Wiratno, 2017

Community-based ecotourism in Tangkahan, Gunung Leuser National Park. Winner of Gunung Leuser National Park Photo Competition, 2016

PHOTO BY
Sri Ratu Noveni, 2016

5.4 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 traditionally 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 2017, partnerships in traditional zones utilization had involved more than 66,000 hectares of traditional zones in 15 National Parks. Access to natural resources in the zones has been facilitated through 41 cooperative agreements signed between community representatives and the Head of the National Parks Office (*Balai Taman Nasional*) (see Table 5.2).

▶ **TABLE 5.2** Cooperative Arrangements (PKS) in the Traditional Zones of National Parks

Number of National Parks in which access is being provided through Traditional Zones	Extent of area covered by PKS (ha)	Total area of the Traditional Zones (ha)	Percentage of the area of PKS relative to the traditional zones	Number of beneficiary households
15	66,053	744,360	8.87	4,812

SOURCE: DJKSDAE, 2018

Through partnership arrangements in the Traditional Zones, 15 National Parks have improved the welfare of 4,812 households in 62 villages. These arrangements enable community members in and around Betung Kerihun Danau Sentarum National Park alone to utilize non-timber forest products such as honey, pine resin, resin, dragon blood, medicinal plants, rattan, illipe nut, mushrooms and forest fruits from. 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 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.

5.5 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),[114] the UNESCO Man and Biosphere Program (MAB), the World Heritage Convention,[115] the Convention on the International Trade of Endangered Species of Wild Fauna and Flora (CITES),[116] and the Ramsar Convention (the Convention on Wetlands of International Importance as Waterfowl Habitat).[117]

[114] Undang-Undang Republik Indonesia No. 5 Tahun 1994 tentang Pengesahan United Nations Convention on Biological Diversity (Konvensi Perserikatan Bangsa-Bangsa mengenai Keanekaragaman Hayati).

[115] Keputusan Presiden Republik Indonesia No. 26 Tahun 1989 tentang Pengesahan Convention Concerning The Protection of The World Cultural and Natural Heritage.

[116] Keputusan Presiden Republik Indonesia No. 43 Tahun 1978 tentang Convention on International Trade in Endangered Species of Wild Fauna and Flora.

[117] Keputusan Presiden Republik Indonesia No. 48 Tahun 1991 tentang Pengesahan Convention on Wetlands of International Importance especially as Waterfowl Habitat.

Convention on Biological Diversity (CBD)

Indonesia ratified the Convention on Biological Diversity (CBD) in 1994.[118] 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 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 and 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 institutional and managerial resources. These new topics were intended to serve 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). SSBSAP will be integrated into South Sumatra's five-year development plan (RPJMD) commencing in 2018.

In addition, Indonesia has also ratified a number of agreements related to the CBD Convention, including the Cartagena Protocol on Biosafety in 2004,[119] 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.[120] 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 Ministry of Environment and Forestry issued a Regulation concerning Access to the Genetic Resources of Wild Species and Profit Sharing from their Utilization.[121]

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.[122]

[118] Undang-Undang Republik Indonesia No. 5 Tahun 1994 tentang Pengesahan United Nations Convention on Biological Diversity (Konvensi Perserikatan Bangsa-Bangsa mengenai Keanekaragaman Hayati).

[119] 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).

[120] 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).

[121] 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.

[122] Keputusan Menteri LHK No. SK.755/Menlhk/KSDAE/KUM.0/9/2016.

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.[123] Indonesia became a member of CITES in 1975, and ratified the Convention in 1978, with implementation commencing in 1979.[124] 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 sciencific authority. To strengthen the implementation of the CITES mechanism, 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 classed as Category 1, the highest category. Many Indonesian species of wildlife and plants are listed in CITES, which covers a total of 4,468[125] species. Of these species, in 2018, 959[126] species were afforded quotas for wild harvest.

[123] https://www.cites.org/eng/disc/what.php

[124] Keputusan Presiden Republik Indonesia No. 43 Tahun 1978 tentang Convention on International Trade in Endangered Species of Wild Fauna and Flora.

[125] https://www.speciesplus.net/#/taxon_concepts?taxonomy=cites_eu&geo_entities_ids=16&geo_entity_scope =cites&page=1

[126] Keputusan Dirjen KSDAE No. SK.500/KSDAE/SET/KSA.2/12/2017 tentang Kuota Pengambilan Tumbuhan Alam dan Penangkapan Satwa Liar Periode Tahun 2018.

The Ramsar Convention (The Convention on Wetlands of International Importance as Waterfowl Habitat)

Indonesia ratified the Ramsar Convention in 1991,[127] 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 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.

UNESCO Man and Biosphere Program (MAB)

The CBD Convention serves as an umbrella for the conservation of biodiversity at the global scale. However, before ratifying this convention, 22 years earlier, in 1994, Indonesia had already committed itself to the Man and Biosphere Program (MAB), conceived by UNESCO in 1968 and launched in 1971. [128]

Indonesia formed the Indonesian National Committee for the MAB Program 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 Pulau

[127] Keputusan Presiden Republik Indonesia No. 48 Tahun 1991 tentang Pengesahan Convention on Wetlands of International Importance especially as Waterfowl Habitat.

[128] http://www.unesco.org/new/en/natural-sciences/environment/ecological-sciences/man-and-biosphere-programme/

Siberut/Siberut National Park (1981), Gunung Leuser/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 brings the total number of biosphere reserves in Indonesia to 11. As of 2017, three additional biosphere reserves had been proposed, these being Berbak Sembilang, Rinjani Lombok, and Betung Kerihun-Danau Sentarum Kapuas Hulu. Decisions related to this matter will be determined at the 30th International Co-ordinating Council on Man and the Biosphere (ICC MAB) in 2018.

World Heritage Sites

World Heritage Sites are sites deemed to have a particularly significant value for all humanity, due to either their natural features, geology and physiographic characteristics or outstanding universal value from scientific or conservation points of view, or natural beauty. The World Heritage program is administered by the UNESCO World Heritage Committee (WHC), which was established at the UNESCO General Conference on 16 November 1972.

The Indonesian Government became a signatory to the Convention Concerning the Protection of the World's Cultural and Natural Heritage on 6 July 1989 and ratified the Convention through a Presidential Decree.[129] Indonesia has been a member of the WHC in the periods from 1989 to 1995 and from 2015 to 2019. Indonesia currently has four World Heritage Sites that play an important role in the conservation of international biodiversity, as they meet the criteria of "having a natural habitat that plays an important role in in-situ conservation for biological diversity, including endangered species of distinctive value from a scientific point of view and conservation." The four World Heritage Sites are:

- *Ujung Kulon National Park*: Designated in 1991, due to its role in preserving last viable habitat for the Javan Rhinoceros (*Rhinoceros sondaicus*).
- *Komodo National Park*: Designated in 1991, due to its role in preserving the habitat of the Komodo dragon, the largest lizard species in the world.
- *Lorentz National Park*: Designated in 1999, due to its role as a habitat for the ancient Gondwanan plant species, which has existed since the warming of the last ice age.
- *Tropical Rainforest Heritage of Sumatra (TRHS):* This consists of Gunung Leuser National Park, Kerinci Seblat National Park and Bukit Barisan Selatan National Park. The areas were designated in 2004, largely due to their extremely high level of biodiversity. Taken together, these three parks contain 50 percent of Sumatra's total biodiversity. TRHS sites contain the world's largest flower (*Rafflesia arnoldi*) and the corpse flower (*Amorphophallus titanum*) which has the largest unbranched inflorescence of any flower in the world.

In addition to its participation in the conventions described above, Indonesia also plays an active role at the ASEAN regional level on matters related to biodiversity, with the Indonesian officials serving as ASEAN Senior Officials on the Environment (ASOEN) and ASEAN Senior Officials on Forestry (ASOF). ■

[129] Keputusan Presiden Republik Indonesia No. 26 Tahun 1989 tentang Pengesahan Convention Concerning The Protection of The World Cultural and Natural Heritage.

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 World Heritage Site and the global communities are participating in preserving it.

LOCATION
Komodo National Park, East Nusa Tenggara Province

PHOTO BY
Janur Wibisono

CHAPTER 6

National Economic Contribution and the Private Sector

6.1 Portrait of Production Forest Management

Indonesia's Production Forest area covers a total area of 68.8 million hectares, of which 30.7 million hectares have been granted to different types of forest products licenses, and the remaining 38.1 million hectares of which are without such licenses. Of the 30.7 million hectares of area for which forest product licenses have been granted, 61 percent (or equal to 18.81 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 36 percent (or 11.18 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). In the case of Industrial Plantation Forests, a regulation was recently promulgated requiring that 20 percent of the total area be made available for communities to plant life-support trees (*tanaman kehidupan*) through partnership arrangements.

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). 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,

Forest is like an oasis in the savanna of Tanah Merapu, Sumba. The remnant forest is the home for remarkable wildlife, including endemic birds.

LOCATION
Manupeu Tanah Daru and Laiwangi Wanggameti National Park, East Nusa Tenggara Province

PHOTO BY
Simon Onggo

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. Since 2007, 16 IUPHHK-RE permits have been granted, covering a total of 623,075 hectares in Riau, Jambi, South Sumatra, Bengkulu, West Kalimantan, Central Kalimantan and East Kalimantan provinces. It is projected that in 2018 that this number will increase to 17, and in 2019 to 18. Table 6.1 shows number and the extent of IUPHHK-HA, IUPHHK-HTI and IUPHHK-RE licenses have been granted in the period of 2011 - 2017.

Forestry licences 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.

▶ **Table 6.1** Number and extent of forest use licenses granted in Production Forest areas from 2011 to 2017

	IUPHHK-HA		IUPHHK-HT		IUPHHK-RE	
	Natural forest selective felling		Industrial Plantation Forests		Ecosystem Restoration	
Year	Extent (Mha)	No. of Units	Extent (Mha)	No. of Units	Extent (Mha)	No. of Units
2011	9.17	215	9.63	233	0.20	4
2012	9.83	238	9.83	238	0.22	5
2013	21.08	277	10.11	254	0.40	9
2014	20.13	273	10.54	277	0.52	13
2015	19.20	263	10.70	280	0.55	14
2016	19.30	268	10.84	286	0.62	16
2017	18.81	259	11.18	293	0.62	16
Note: Mha = millions of hectares						

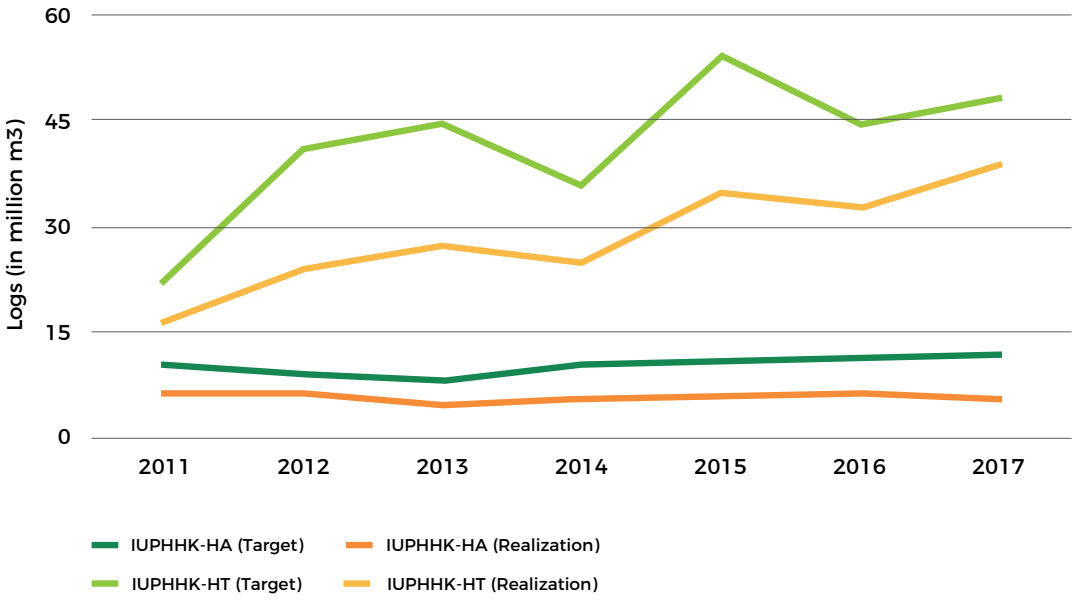
SOURCE: KLHK, 2018q

Meanwhile, the 38.1 million hectares of Production Forest that are not licensed for purposes of selective felling of natural forest timber, Industrial Plantation Forests, or ecosystem restoration are accounted for in part by 9.12 million hectares of primary forest that are for now protected by the moratorium on new forestry permits (PIPPIB), 4.50 million hectares of specific areas (*Wilayah Tertentu*, WT) of Production Forest Management Units (*Kesatuan Pengelolaan Hutan Produksi*, KPHP) that already developed their Long-Term Forest Management Plans, 12.82 million hectares of Convertible Production Forest (*Hutan Produksi yang Dapat Dikonversi*, HPK) of which 2.17 million hectares which have been or will be allocated under the auspices of land reform, 5 million hectares is allocated for new forest utilization permits and 6.98 million hectares which have been or will be given to communities for three social forestry mechanisms, HD, HKm, and HTR. [130]

Logging concessions in natural forests (HPH) and Industrial Plantation Forests (HTI) are the main producers of logs in Indonesia. Logs is still the primary commodity of these upstream industries. However, the trend now is changing toward the utilization of non-timber forest products and ecosystem services. Figure 6.1 shows that log production from 2011 to 2017, both from natural forests and from Industrial Plantation Forests, is below annual targets.

The gap between targeted and actual log production is due to several problems in the field which must be handled by concession holders. Low levels of log production with high production costs has lowered the profits of many natural forest concessions. This diminishing profitability is part of the reason that 36 percent of natural forest

[130] Keputusan Menteri LHK No. SK. 4732/Menlhk-PHPL/KPHP/HPL.0/9/2017 tentang Peta Indikatif Arahan Pemanfaatan Hutan Produksi yang Tidak Dibebani Izin Untuk Usaha Pemanfaatan Hutan.



Source: DJPHPL, 2018a

SOURCE: DJPHPL, 2018a

▶ **FIGURE 6.1** Target and Realization of Log Production from IUPHHK-HA and IUPHHK-HTI

concession holders are not working at all. For its part, the government is trying to help by evaluating the performance of natural forest timber concessions, and developing their commitment in managing the Production Forest sustainably. Through these efforts, it is hoped that these companies will begin to operate in a healthier way, and obtain more profit while protecting the sustainability of the forest.

Meanwhile, 25 percent of Industrial Plantation Forests (HTI) in Indonesia have poor performance. 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 have instructed concession holders to:

1. Conduct conflict mapping in the HTI and develop appropriate conflict resolution plans[131].
2. Allocate 20 percent of HTI areas to communities for the planting of life-support trees[132].
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, Commuity Forests, Village Forests and *Adat* Forests.

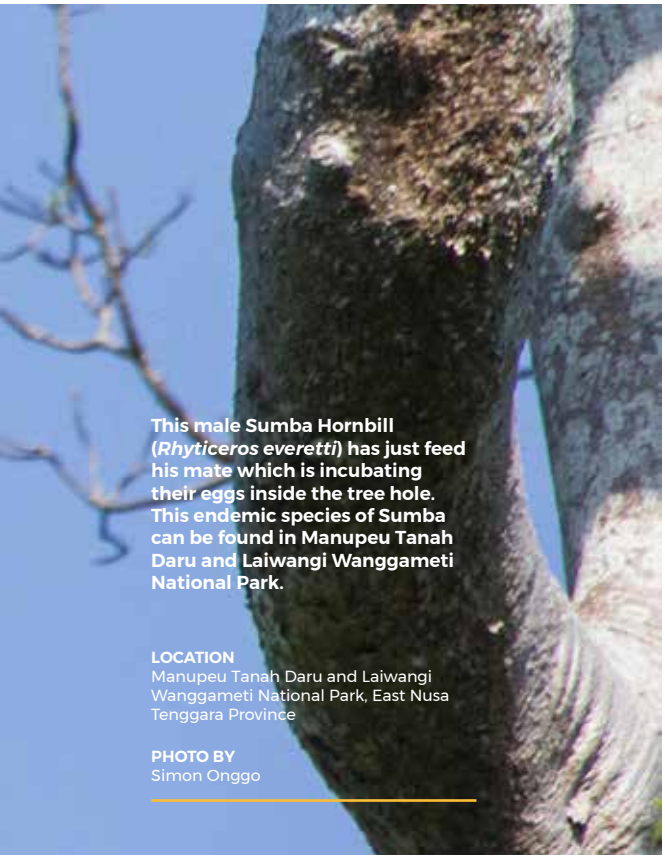
[131] Peraturan Dirjen PHPL No. P.5/PHPL/UHP/PHPL.1/2/2016 tentang Pedoman Pemetaan Potensi dan Resolusi Konflik pada Pemegang Izin Usaha Pemanfaatan Hasil Hutan Kayu (IUPHHK) dalam Hutan Produksi.

[132] Peraturan Menteri LHK No. P.12/MENLHK-II/2015 tentang Pembangunan Hutan Tanaman Industri.

By the end of 2017, 188 Memorandums of Understanding (MoU) for Forest Partnerships between HTI and communities had been agreed, involving 16,900 people in six provinces (see Table 6.2).

TABLE 6.2 Forest Partnership MoUs between communities and HTI as of the end of 2017

No.	Province	Number of MoU	Extent of Forest Partnership areas (in ha)	Number of community members
1	Jambi	32	20,067	8,468
2	South Kalimantan	4	708	121
3	East Kalimantan	27	1,989	697
4	West Nusa Tenggara	4	52	104
5	Riau	26	8,281	2,998
6	South Sumatra	95	104,623	4,593
	Total	**188**	**135,720**	**16,981**



This male Sumba Hornbill (*Rhyticeros everetti*) has just feed his mate which is incubating their eggs inside the tree hole. This endemic species of Sumba can be found in Manupeu Tanah Daru and Laiwangi Wanggameti National Park.

LOCATION
Manupeu Tanah Daru and Laiwangi Wanggameti National Park, East Nusa Tenggara Province

PHOTO BY
Simon Onggo

6.2 The Contribution of Forest Resource to National Revenue

6.2.1 Contribution of timber and non-timber forest products

In terms of their economic function, forests are the 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. Forests serve as a life support system, so their environmental functions must be maintained in order to ensure the sustainability of life on earth. Similarly, forests should serve a social function, providing concrete benefits for all members of the human community.

In 2015, the total value of the non-tax state revenues derived from the forestry sector amounted to IDR 4,157 billion or USD 300.8 million.[133] However, state revenues in this amount are probably not as important (and also probably do not exceed in economic terms) the benefits from forests that flow to communities living in around the Forest Area. While the formal economic function of the forestry sector must be recognized, as should the contribution of forests to state revenues, equal attention must be given to other functions of forests.

The Production Forest's economic functions should be utilized to provide optimal benefits for all members of the community in a just and equitable manner, while at the same time maintaining the sustainability of the forests.[134] Utilization of Production Forests includes non-extractive forms of utilization of actual areas of forest (for example, eco-tourism), environmental services that flow from forests, as well as the harvesting of not only timber but also non-timber forest products.[135] Production forests can be utilized following the issuance of permits based in the utilization types[136].

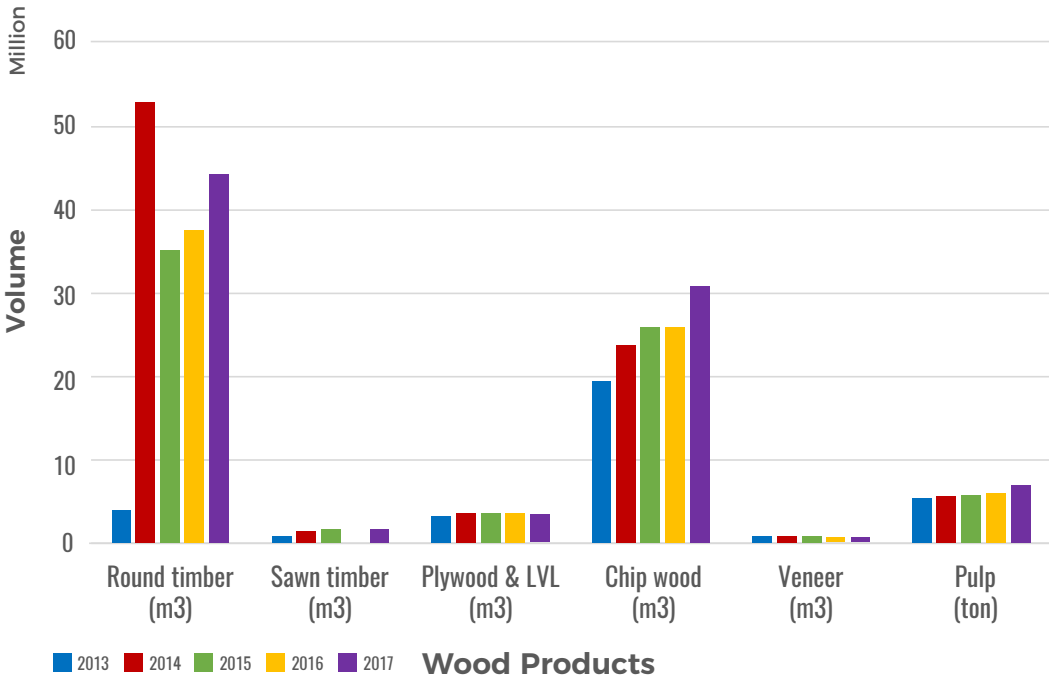
[133] Indonesian Statistics, 2017

[134] Undang-Undang Republik Indonesia No. 41 Tahun 1999 Pasal 23.

[135] Undang-Undang Republik Indonesia No. 41 Tahun 1999 Pasal 28 ayat (1).

[136] Undang-Undang Republik Indonesia No. 41 Tahun 1999 Pasal 28 ayat (2).

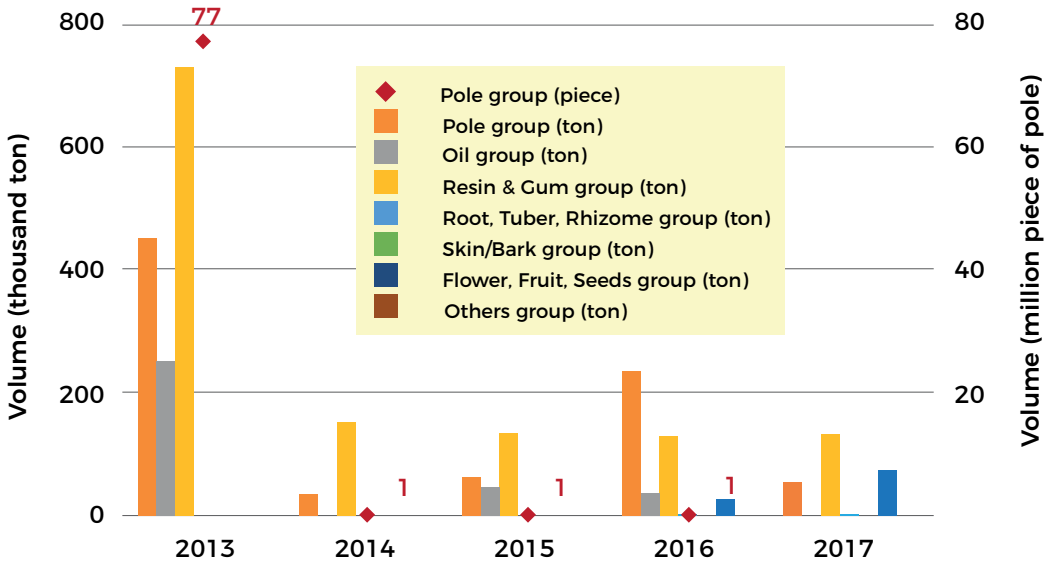
Data for the period from 2013 to 2017 shows that there have been significant fluctuations in the level of the production of logs, with flat or sustained increases in the production of all categories of processed timber, in the form of sawnwood, plywood & laminated veneer lumber, chipwood, veneer, and wood pulp (see Figure 6.2).



SOURCE: KLHK, 2018m

▶ **FIGURE 6.2** Volume of production of Indonesian timber and timber products (2013 to 2017)

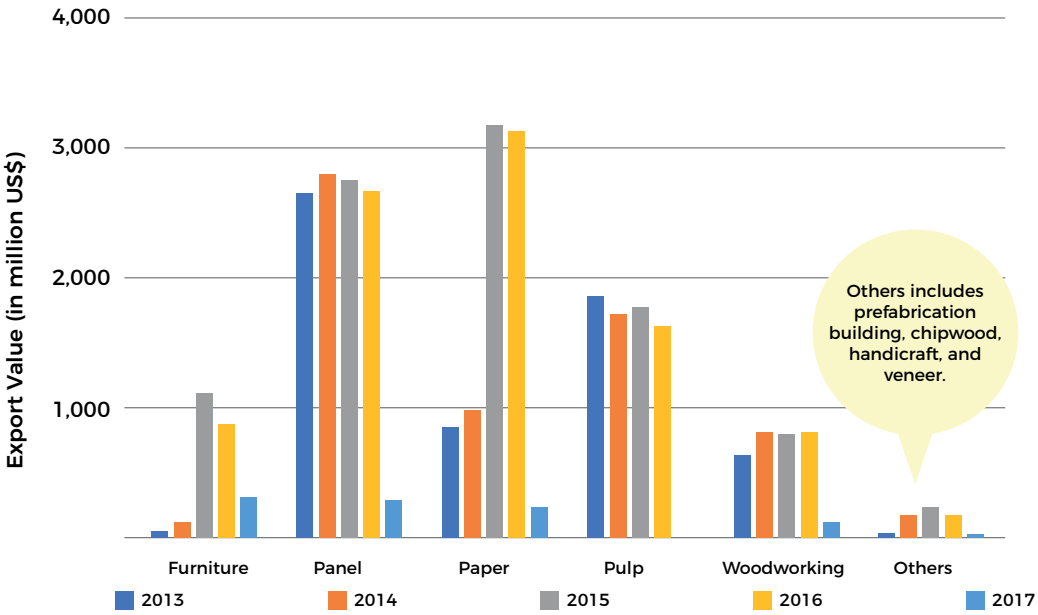
By contrast, during the same years, the level of production for non-timber forest commodities has declined to the point where, during some years, data is not available for some of these commodities (see Figure 6.3).



SOURCE: KLHK, 2018n

FIGURE 6.3 Indonesia's Non-timber Forest Product Production (2013-2017).

Meanwhile, during the same period of time, a significant, sustained increase has been recorded in the annual export processed timber products (see Figure 6.4).



Source: KLHK, 2018o

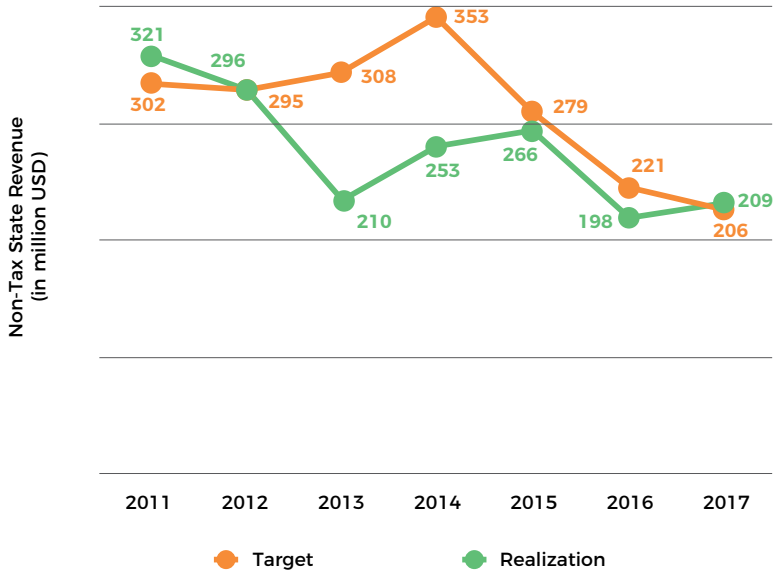
SOURCE: KLHK, 2018o

▶ **FIGURE 6.4** Export of processed timber products (2013 to 2017)

6.2.2 Non-Tax State Revenue from timber, NTFP, and forest area utilization

Non-Tax State Revenue (*Penerimaan Negara Bukan Pajak*, PNBP) refers to all revenues conveyed to the nation which are not sourced from taxes. From 2011 to 2017, sources of PNBP from the forestry sector included payments into the Reforestation Fund (*Dana Reboisasi*, or DR), the Forest Resource Royalty (*Provisi Sumber Daya Hutan*, or PSDH), the Forest Product Utilization Business License Fee (*Iuran Izin Usaha Pemanfaatan Hasil Hutan*, or *Iuran* IUPHH), the Environmental Services Utilization Business License Fee (*Iuran Izin Usaha Pemanfaatan Jasa Lingkungan*, or Iuran IUPJL), Forest Exploitation Violation Fines (*Denda Pelanggaran Eksploitasi Hutan*) and Stumpage Compensation (*Ganti Rugi Nilai Tegakan*, 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 2017 was USD 1.754 billion, out of a target of USD 1.963 billion.

In order to increase PNBP, the government has taken the following steps: regulation 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, developing, and evaluating information systems, PNBP credit handling, and optimizing PNBP from non-timber forest products. Figure 6.5 shows the target and realization of PNBP from DR, PSDH, *Iuran* IUPHH, *Iuran* IUPJL, Forest Exploitation Violation Fines and Stumpage Compensation from 2011 to 2017.



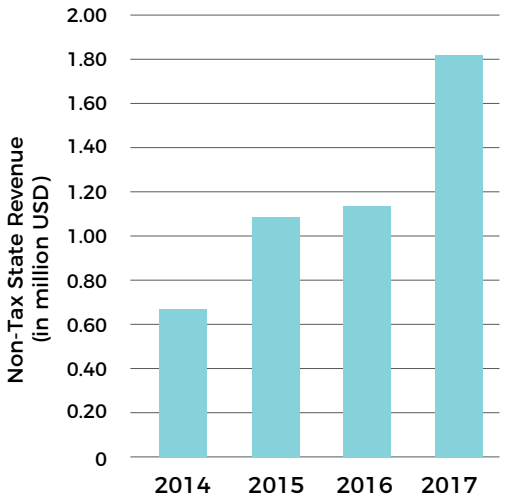
SOURCE: KLHK, 2018r

FIGURE 6.5 Targeted and Realized Non-Tax State Revenues from Forestry, 2011 to 2017

6.2.3 Contribution of conservation areas to national revenue

In addition to the Non-Tax State Revenue (PNBP) from the forestry sector, non-tax revenues are also being generated from business activities in Conservation Forests from the legal export of plants and wildlife, from nature recreation businesses, and from the utilization of water, water energy, and geothermal power.

Figure 6.6 shows the PNBP from the legal export of plants and wildlife for the period of 2014-2017. The trend is increasing, mainly because more conducive regulations were issued in 2014[137] and 2016[138]. PNBP collected from activities related to the legal export of plants and wildlife in 2017 exceeded targets for that year by 246 percent. PNBP targeted for that year was IDR 10 billion or USD 736,845, but IDR 24.6 billion or USD 1.81 million was realized. These amounts derived from royalties for the domestic and international sale of plants and wildlife, licenses for captive breeding, licenses for conservation institutions, permits to collect research samples, fees for utilizing plants and wildlife, and fees for access to conservation areas.



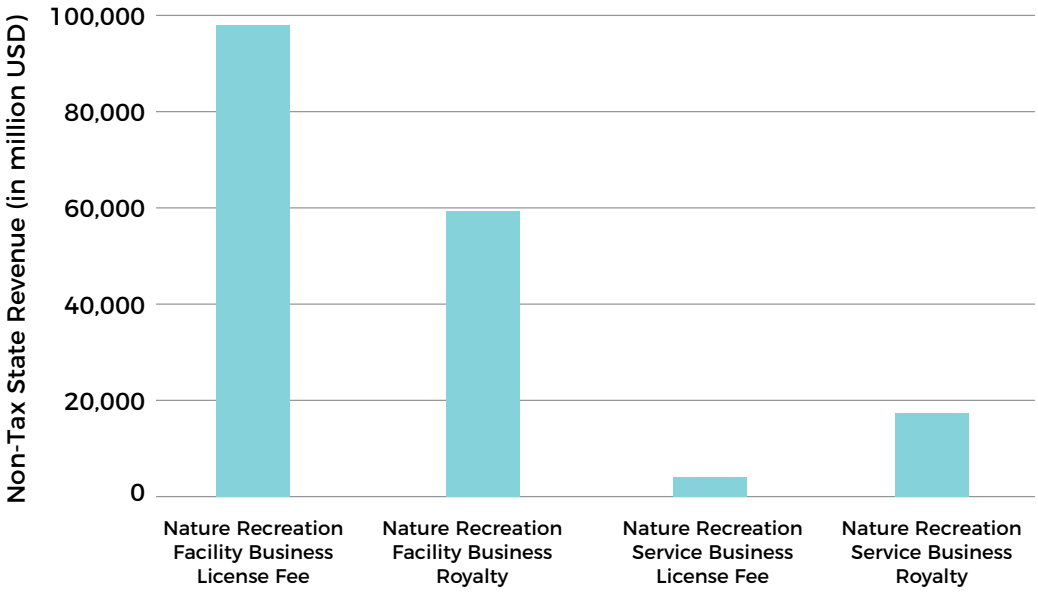
SOURCE: DJKSDAE, 2018.

▶ **FIGURE 6.6** Non-Tax State Revenue from the Plants and Wildlife Trade (2014 to 2017)

Nature recreation facilities and services also generated Non-Tax State Revenue (PNBP). For the period of 2015 to 2019, a target was set to collect license fees and business royalties from 100 new nature recreation facilities and services, calculated against a 2013 baseline. On average, fees were collected from 54 new businesses each year, which exceeded the target of 20 new businesses per year by 250 percent. Currently, revenues are being collected from 271 nature recreation facilities and services. In 2017, PNBP derived from licenses and business royalties for nature recreation facilities and services reached IDR 2,392,942,405 or USD 176,323. Figure 6.7 shows the breakdown of this amount based on the sources.

[137] Peraturan Pemerintah Republik Indonesia No. 12 Tahun 2014 Tentang Jenis Dan Tarif Atas Jenis Penerimaan Negara Bukan Pajak Yang Berlaku Pada Kementerian Kehutanan

[138] Peraturan Menteri LHK No. P.86/MENLHK/SETJEN/KUM.1/11/2016 tentang Penetapan Harga Patokan Tumbuhan dan Satwa Liar di Dalam Negeri atau di Luar Negeri.



SOURCE: DJKSDAE, 2018.

▶ **FIGURE 6.7** Non-Tax State Revenue from Nature Recreation Business in 2017

Conservation areas have ecosystem services whose value is seldom quantified. These ecosystem services include water services, water energy, and geothermal power. For the period of 2015 to 2019 the target for collection of license fees from new water companies, new hydroelectric power companies, and new geothermal companies in conservation areas was set at 25 units, 50 units, and 5 units, respectively. Dividing this five-year target into annual targets, the 2017 target aims for revenues to be collected from licenses for five new water companies, ten new hydroelectric power companies, and one new geothermal company. For water services and hydroelectric power, these 2017 targets were exceeded, as revenues were collected from new licenses granted to 40 new water companies and 14 new hydroelectric power companies. For water service and water energy licenses alone, the total PNBP for 2017 was IDR 325,968,800 or USD 24,019. Meanwhile, the regulation to collect PNBP from geothermal business licenses is still in the drafting process, so although a geothermal license was awarded in 2017, no license fee was collected. Table 6.3 summarizes targets and realization from 2013 to 2017.

TABLE 6.3 Targeted and realized ecosystem services utilization licenses in conservation areas (2013 - 2017)

Year	Number of utilization licenses		
	Water Services	Water Energy	Geothermal
2013	0	0	
2014	65	1	
2015	12	5	0
2016	29	16	1
2017	40	14	1
Total	146	36	2
Total target in 2019	25	50	5

SOURCE: DJKSDAE, 2018

Straight and big standing tree found during forest inventory in Unit XVI, BKPH Wilayah XIII, 2018

LOCATION
Kab. Tanjung Jabung Barat, Bpkh Wilayah XIII Pangkalpinang

PHOTO BY
Forest Area Consolidation Office Regional XIII Pangkalpinang (BPKH XIII Pangkalpinang)

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 ensures the sustainability of forest resources.

One year later, the Ministry of Forestry worked with a range of stakeholders in Indonesia 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 Verification System (*Sistem Verifikasi Legalitas Kayu*, SVLK)[139] 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,[140] 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[141] and coming into force on 15 November 2016.[142]

FLEGT licenses represent a significant achievement by Indonesia in terms of 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.

[139] Peraturan Menteri Kehutanan No. P.38 Tahun 2009 tentang Standard dan Pedoman Penilaian Kinerja Pengelolaan Hutan Produksi Lestari dan Verifikasi Legalitas Kayu Pada Pemegang Izin Atau Pada Hutan Hak.

[140] Peraturan terbaru mengenai SVLK adalah PermenLHK No. P.30/2016 serta Perdirjen PHPL No. P.14/2016 jo P.15/2016.

[141] Peraturan Presiden No. 21 Tahun 2014.

[142] Based on decision of the 5th Joint Implementation Committee (JIC) in Yogyakarta on 15 September 2016.

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.

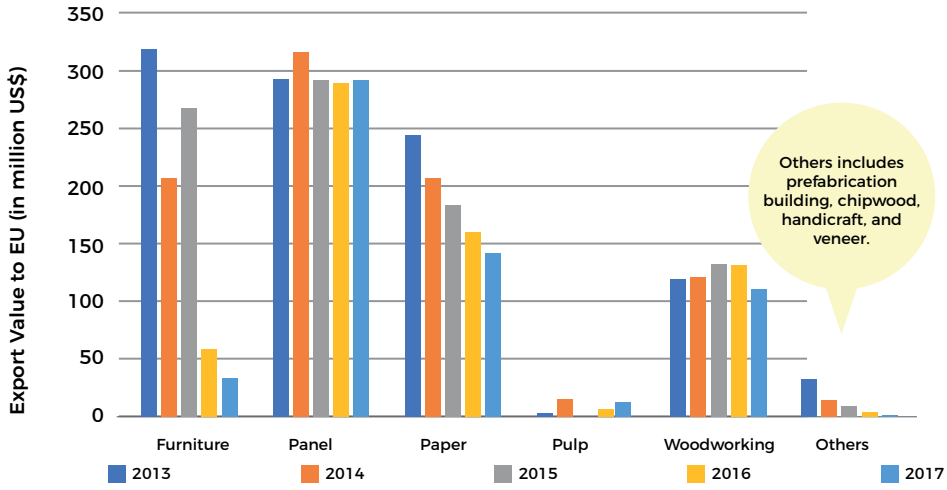
According to data from http://silk.dephut.go.id, in the period from 15 November 2016 to 29 January 2018, 47,035 FLEGT licensed shipments were received by importers in 28 countries in the European Union, with a total associated export value of US$ 1.33 billion (see Figure 6.8).

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 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.

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 (*Komite Akreditasi*



Source: KLHK, 2018p

SOURCE: KLHK, 2018p

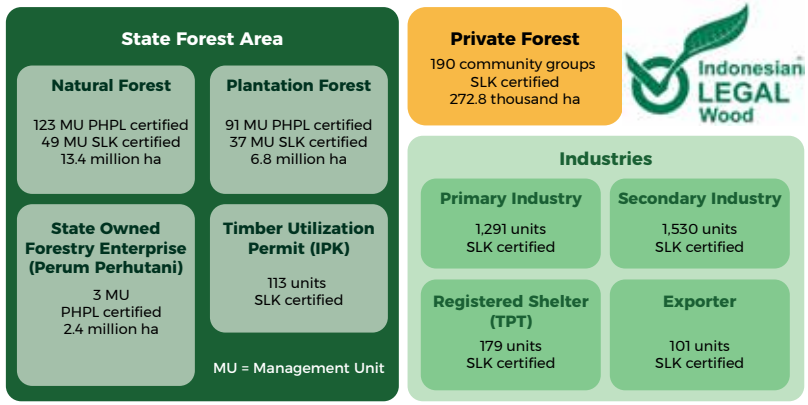
▶ **FIGURE 6.8** Value of Indonesian Timber Exports to the **European Union (2013 - 2017)**

Nasional, 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 (*Sertifikasi Pengelolaan Hutan Produksi Lestari,* PHPL) and Certification of Timber Legality (*Sertifikasi Legalitas Kayu,* 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 downstream sector (timber industries, Registered Shelters (Warehouses) or *Tempat Penampungan Terdaftar*/TPT, 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 in to prepare room for industrial timber and oil palm plantations, know as Timber Utlization Permits (*Izin Pemanfaatan Kayu*/IPK). SLK certificates are valid for one defined period, 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 2017, the number of management units (MU) or business enterprises that had obtained PHPL certificates or SLK certificates is shown in Figure 6.9:



SOURCE: DJPHPL, 2018b

▶ **FIGURE 6.9** Progress of PHPL and SLK Certification, as of December 2017

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.

TABLE 6.4. Facilitation provided to MSMEs to implement SVLK

Activity	2015	2016	2017	2018*	2019*
Certification	21 Private Forests (*Hutan Hak*) and 18 MSMEs (of 101 units)	13 MSMEs (of 119 units)	2 MSMEs (of 9 units)	150 groups	170 groups
Inspection	22 Private Forests (*Hutan Hak*) and 1 MSME (of 6 units)	2 MSMEs (of 10 units)	13 MSMEs (of 93 units)		

* Targets

SOURCE: DJPHPL

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.

6.4 Changing 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. Forest management is implemented by utilizing all potential values from the production forest, both timber and non-timber, as well as environmental services. Thus, the management of Production Forests takes into account food and energy security as well as the availability and security of palatable water (See Boxes 6.1 and 6.2). This paradigm shift is expected to lead to a higher level of harmony and balance between the three functions of Production Forests (economic, social and ecological).

Box 6.1

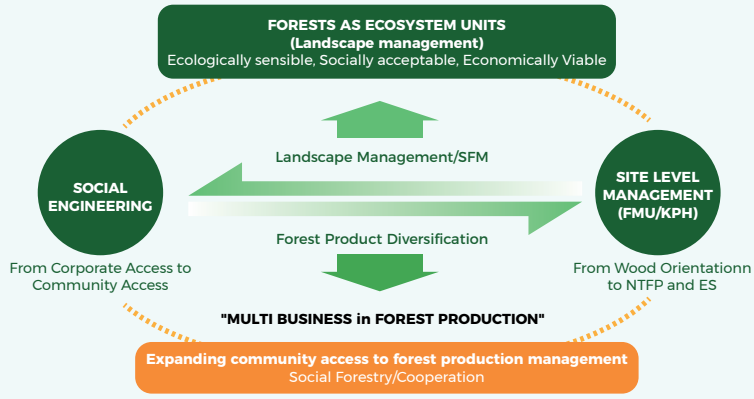
New Business Configurations for Sustainable Production Forest Management

In order to realize forest governance that is beneficial for community prosperity in Indonesia, a significant shift is underway from timber management based on licensing to forest management with more of a site focus. FMUs, provincial and district level governments play an extremely significant role in strengthening the national forest management system at the site level. The institutional model according to which FMU operate is based on three principles, these being economic, social and ecological management.

The change in paradigm is 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, eco-tourism, agro-forestry, non-timber forest products, and environmental services; an increase in the proportion of resources made available to communities; conflict resolution; and increased effectiveness of forest management. 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.

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, more effective management of KPHs can be achieved, with greater benefits for community members. Consideration is being given to one site, one product sustainably. The critical determinant for the success of the new business configuration 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.

BUSINESS RECONFIGURATION IN PRODUCTION FORESTS



CONTRIBUTOR: Directorate General of Sustainable Production Forest Management.

Box 6.2

Kendilo Production Forest Management Unit, East Kalimantan

Kendilo Production Forest Management Unit (KPHP Kendilo) covers parts of four sub-districts -- Muara Komam, Batu Sopang, Muara Samu and Batu Engau -- all within Paser District. The Extent of KPHP Kendilo is 137,495 hectares. KPHP Kendilo is divided into a Protection Forest (*Hutan Lindung*, HL) area of 41,558 hectares, a Limited Production Forest (*Hutan Produksi Terbatas*, HPT) of 34,049 hectares, and permanent Production Forest (*Hutan Produksi,* HP) of 61,888 hectares.

Non-timber forest products identified by KPHP Kendilo as having the highest potential for development include bamboo, rattan, honey, and compost. Ecosystem services have also been identified as having potential for development, such as the bottling of drinking water. Meanwhile, new ways of utilizing the KPHP's area for business purposes include nature tourism, and the Riam Siteru camping ground.

KPHP Kendilo has been implementing agroforestry activities through endemic forest trees planting, and the inter-cropping of trees with rice, maize and vegetables. These agroforestry activities have been conducted through partnerships with forest farmer groups. The first rice harvest was conducted in May 23, 2017, with rice marketed locally, in the village and within the district, as well as regionally within the East Kalimantan province. Chilli and maize were also harvested from these agroforestry areas. The first maize harvest was in April 25, 2017. ■

CONTRIBUTOR: Directorate General of Sustainable Production Forest Management.

The most significant change according to this new paradigm is the reposition of community's role in the management of production forests, from instead serving only as a source of labor to become active entrepreuners 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 the resources derived from Production Forests to form new forestry business configuration. Forest Management Units (FMU) play a critical role in facilitating this new paradigm. As such, a target has been set to establish 347 production forest management units (KPHP) by 2019 to cover all production Forest Areas. As of 2017, 212 KPHP had been established, of which 91 KPHP have already developed their Long-Term Forest Management Plans (*Rencana Pengelolaan Hutan Jangka Panjang*, RPHJP), which include social forestry programs. The paradigm is shifting from access to licenses for forest corporations to expanding community access. Local communities may be involved in Production Forest management through non-license forest utilization schemes by partnering with FMU.[143]

Another change relates to the increased efforts to maintain the ecological functions of production forests and thereby to facilitate the achievement of Nationally Determined Contribution (NDC) targets. These targets mandate a minimum 29 percent reduction of emissions by 2030, with the forestry sector responsible for 17 percent of that amount. This is to be achieved through 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 will be applied to all production forest concession holders. RIL-C is an intensive logging technique 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 the 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 logging practices. To date, 22 IUPHHK concession holders in natural forests have implemented RIL-C. By early 2018, this policy implementation will become mandatory for all concession holders. 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 developments of certification and information systems. To ensure that Indonesia's exports remain competitive in dealing with increased global and regional competition, processes related to obtaining production forest business licenses must be made simpler and faster. A number of systems, including the Forest Product Administration Information System (*Sistem Informasi Penatausahaan Hasil Hutan*, SIPUHH);[144] the Timber Legality Information System (*Sistem Informasi Legalitas Kayu*, SILK), the Non-Tax State Revenue Information System (*Sistem Informasi Penerimaan Negara Bukan Pajak*, SIPNBP),[145] the Industrial Raw Material Supply Plan Information System (*Sistem Informasi Rencana Pemenuhan Bahan Baku Industri*, SIRPBBI) and the Technical Officer Information System (*Sistem Informasi*

[143] Peraturan Menteri Lingkungan Hidup dan Kehutanan Nomor P.49/MENLHK/SETJEN/KUM.1/9/2017 tentang Kerjasama Pemanfaatan Hutan pada Kesatuan Pengelolaan Hutan.

[144] Monitoring of production and distribution of forest product.

[145] Monitoring of Non-Tax State Revenue from forest utilization.

Tenaga Teknis, SIGANIS)[146] have already been implemented, with these systems expected to increase efficiency both in terms of time and cost. All of these systems have been integrated within the Sustainable Production Forest Management Information System (*Sistem Informasi Pengelolaan Hutan Produksi Lestari*, SIPHPL; see Box 6.3).

SIPUHH is intended to reduce bureaucratic costs for forestry business sector to make them efficient, well structured, and adhere the rules. In past decades, forest products administration was implemented primarily to record, document, and report on the utilization of forest resources in order to ensure compliance with obligations to the State and to facilitate the achievement of forest sustainability. The administration processes were conducted manually, with supervision performed by officials located on the ground in associated forest sites. However, this mechanism was constrained by limited number of government officers, high cost economy that burden the business, and often inaccurate information.

Since 1 January 2016, a new system was introduced. This is a web-based procedure for self-assessment called Forest Product Administration Information System (SIPUHH). The system has significantly reduced bureaucratic procedures and requires less 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 utilize forest products, distribution hub, and primary wood processing industries.

The system 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 the top 99 public service innovations in 2017, with more than 3,054 competing contestants participated in this award. SIPUHH also awarded as Top 40 Public Service Innovation for 2017, based on Decree No. 40, 2017.

[146] Monitoring of human resources with technical specific competency for facilitating the process of forest products utilization.

Box 6.3

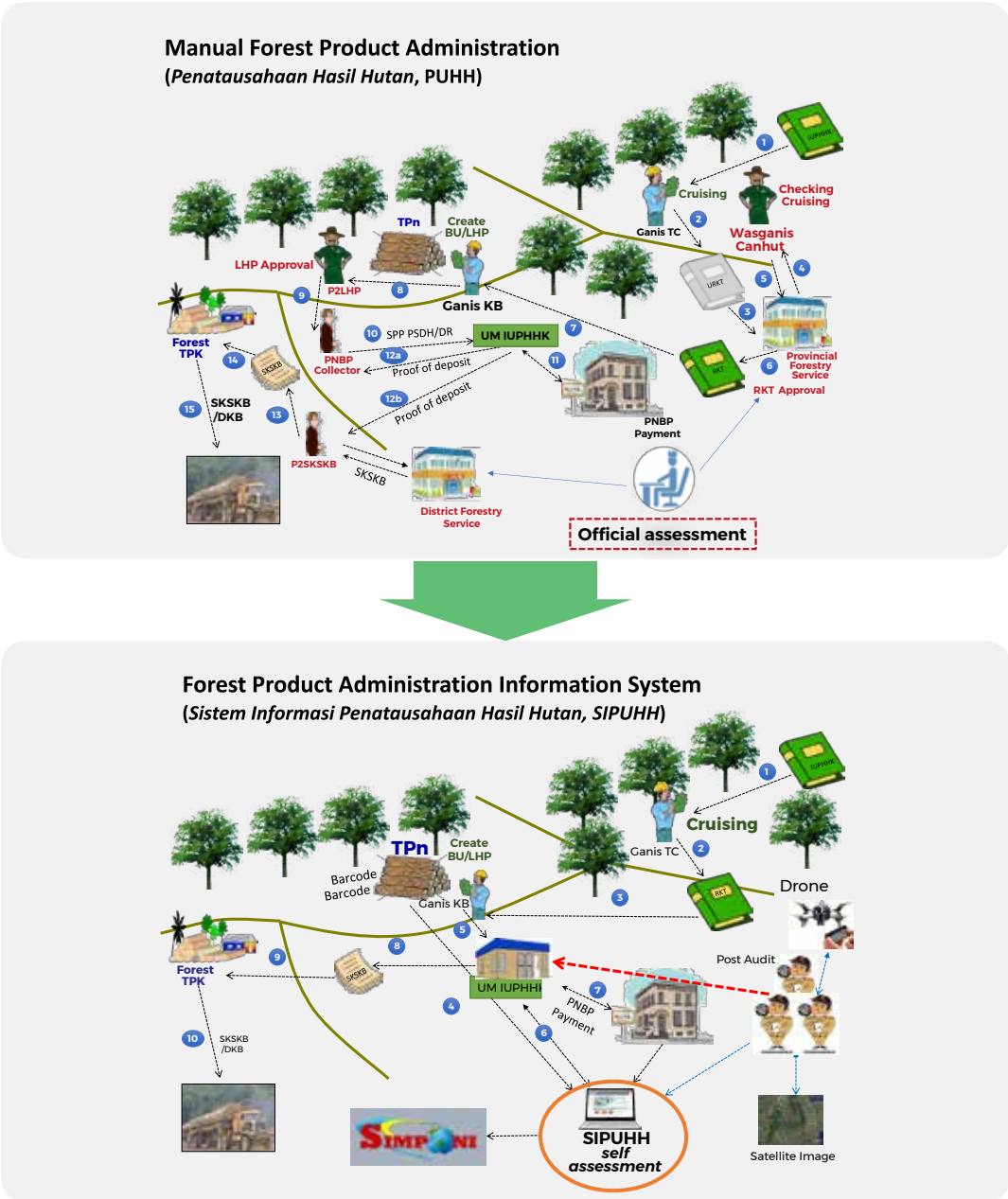
The Sustainable Production Forest Management Information System (SIPHPL): The Integration of Information Systems at the Directorate General for Forest Management Information Systems

The Sustainable Production Forest Management Information System (*Sistem Informasi Pengelolaan Hutan Produksi Lestari*, SIPHPL) was established to facilitate transparent, accountable and sustainable forest management, while at the same time protecting state revenues and ensuring good governance. SIPHPL is an information technology-based system used to supervise and control the governance of all aspects of the timber industry, including records of timber receipts, processing and marketing. With the establishment of this system, the management unit does not need to enter data from timber reports manually.

To facilitate the reconciliation of data, SIPHPL is integrated with other information systems at the Directorate General of Sustainable Production Forest Management, including the Forest Product Administration Information System (SIPUHH); the Non-Tax State Revenue System (SIPNBP); the Industrial Raw Material Supply Plan Information System (SIRPBBI) and Timber Legality Information System (SILK). SIPHPL also includes information related to timber forest products derived from community forests and imported timber that has not been recorded either by the ministry or by local districts.

This system was developed to meet the need to reconcile data related to forest management and the production and processing and marketing of wood forest products, for both domestic and export purposes. The system is intended to improve the accuracy and transparency of supply chain data related to timber derived from production forests, forest industries and forest products marketing. It is also intended to ensure that the State receives the revenues to which it is entitled from the forestry sector. Thus, SIPHPL enables the Ministry of Environment and Forestry to collect and process all data related to timber production and trade, both domestically and abroad. It also facilitates the detection of errors and/or irregularities in processes related to timber governance. ■

CONTRIBUTOR: Directorate General of Sustainable Production Forest Management, 2018



NOTES

Ganis TC = *Tenaga Teknis Timber* Cruising (Timber Cruiser)
Wasganis = *Pengawas Tenaga Teknis* (Cruising Supervisor)
Canhut = *Perencanaan Hutan* (Forest Planning)
RKT = *Rencana Kerja Tahunan* (Annual Work Plan)
Ganis KB = *Tenaga Teknis Pengujian Kayu Bulat* (Log Grader)
BU/LHP = *Buku Ukur/Laporan Hasil Produksi* (Log Book)
P2LHP = *Pejabat Pengesah Laporan Hasil Produksi* (Log Book Officer)
UM = *Unit Manajemen* (Management Unit)
IUPHHK = *Izin Usaha Pemanfaatan Hasil Hutan Kayu* (Business License for the Utilization of Timber Forest Products)
PNBP = *Pendapatan Negara Bukan Pajak* (Non-Tax State Revenue)
SKSKB = *Surat Keterangan Sah Kayu Bulat* (Legal Log Certificate)
TPn = *Tempat Penampungan Kayu* (Temporary Log Yard)
TPK = *Tempat Penimbunan Kayu* (Permanent Log Yard)
SKSKB/DKB = *Surat Keterangan Sah Kayu Bulat/Daftar Kayu Bulat* (Legal Log Certificate/Log List)
P2SKSKB = Petugas Penerbit Surat Keterangan Sah Kayu Bulat (Legal Log Certificate Officer)
SPP PSDH/DR = Surat Perintah Pembayaran Provisi Sumberdaya Hutan/Dana Reboisasi (Payment Instruction for Forest Resource Royalty/Reforestation Fund)

Straight and big standing tree at PT Gunung Meranti, Central Kalimantan Province.

LOCATION
Central Kalimantan Province

PHOTO BY
Rina Tektonia

CHAPTER 7

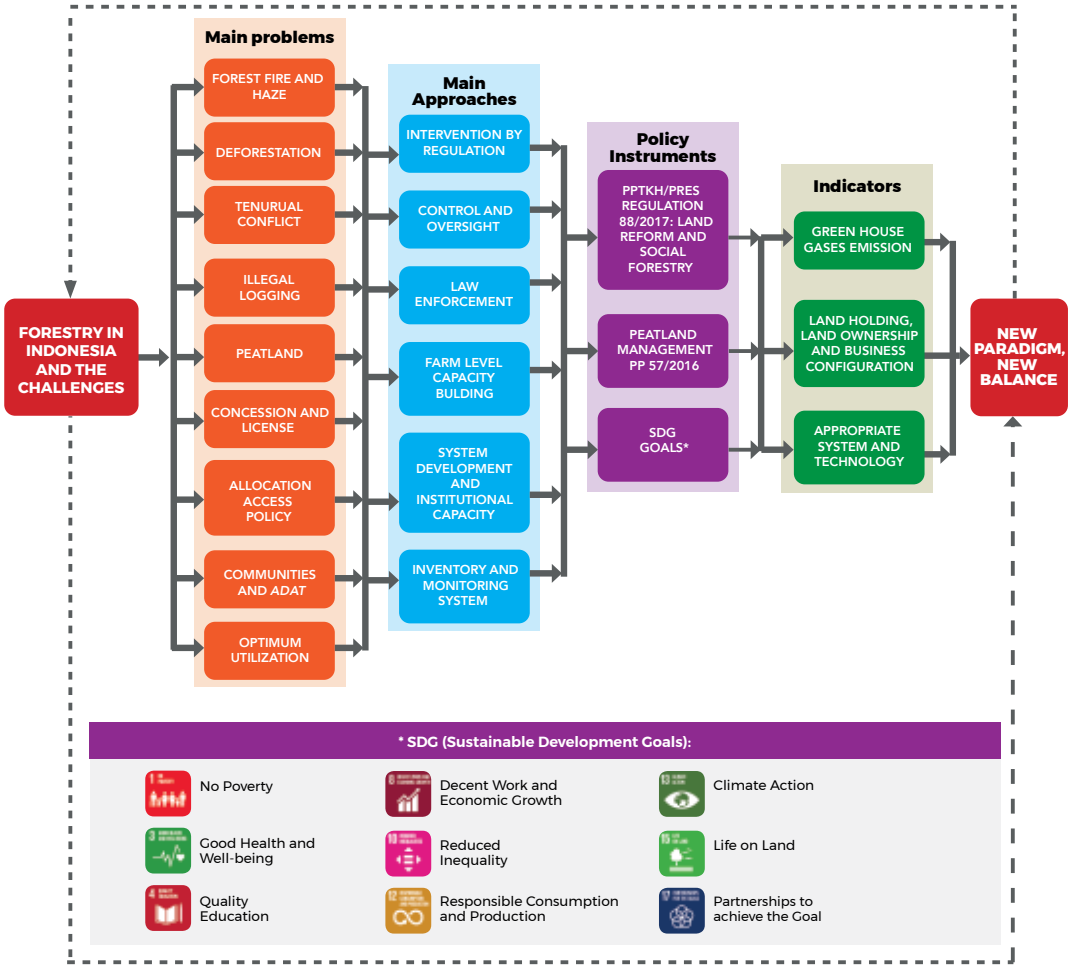
Concluding Note

A major shift is taking place in the country toward a new perspective of sustainability. In the past, various policies and actions were mainly aimed at achieving sustainable forest production. Now the perspective is shifting toward balancing social, environmental and economic developmental values for the benefit of the country. This includes democratization of the allocation of forest resources; prevention of deforestation and forest degradation; and ensuring environmental justice and equality of opportunity for all Indonesian communities, including *Adat* communities.

In 2015, under the administration of President Joko Widodo, the Ministry of Environment and Forestry was established. This integrated two large portfolios, forestry and environment. The purpose of the integration is to address persistent national-scale environmental challenges, including relatively high rates of deforestation, recurrence of serious haze and wild fires, continuous illegal logging, tenurial conflicts, unsustainable use of peatlands, limited community access to forest resources, and inappropriate management regimes in production forests. For the wood-based industries, the government is facilitating them, as well as evaluating their working performance, in order to improve their commitment to managing the production forest sustainably.

Social forestry is being accelerated with an explicit emphasis on improving the welfare of forest communities – under the orders of President Joko Widodo. Through new partnership arrangements, conservation areas have also contributed to improving the welfare of households, especially in or at the fringes of 15 national parks. The Ministry is accelerating social forestry though the timely introduction of policy reforms, improved government regulations, and at the imposition of better controls at all levels. Presidential Regulation No. 88 of 2017 regarding the settlement of tenurial conflict, for instance, is a major reform in providing livelihood assurances and legal solutions to many community conflicts, paving the way to more extensive social forestry. Underlining these efforts, the Government launched an equitable economy policy to reduce inequality starting in 2015. The agrarian reform (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 communities and/or *Adat* communities.

The government also promotes local capacity building, and institutional development, while developing a nationwide resource inventory and monitoring system. To support the inventory and monitoring of forest areas, the government developed the Environment and Forestry Thematic Geospatial Information System which, when integrated with the National Geospatial Information Network, will enable Indonesia's One Map policy - a standard geospatial reference for the nation. It is hoped that the One Map will help Indonesia to avoid the European experience of the "Tragedy of the Commons," where inattention and inexperience led to public lands being overused and destroyed.



▶ **FIGURE 7.1.** Forest Governance in Indonesia: New Paradigm, New Concept

The moratorium on the utilization of primary natural forest and peatlands under Presidential Instruction No. 6 of 2017 is also a significant policy, as it suspends the issuance of new permits in one third of the nation's land area. In addition, Government Regulation No. 57 of 2016 related to peatland management reduces pressure on the use of peatlands for crop plantations and will also significantly reduce fire hotspots and annual forest fire recurrence. President Joko Widodo has reaffirmed Indonesia's commitment to preventing fires and has emphasized the importance of effective early warning and prevention, systems of reward and punishment, the importance of improving field reviews, law enforcement, synergies between central and local government agencies, and all elements of society supporting and playing a role in fire prevention.

Indonesia is fully committed to achieving all Sustainable Development Goals (SDG), and takes into account the economic needs and well-being of a population of no less than 250 million. The nation's recent interventions and corrective measures reflect a new paradigm

in managing, governing and administering forest resources. Indonesia also plays an active role in forums to foster global cooperation to address the climate issue, particularly forums associated with the United Nations Framework Convention on Climate Change (UNFCCC).

Indonesia's new approach is expected to provide a new balance in land holding and business configurations, with better equity to smallholders and local communities. Furthermore, the new approach is also expected to go beyond empowerment of local communities by creating local entrepreneurs that are well-equipped and productive. This may contribute to a gradual reduction in greenhouse gas emissions in order to achieve the national targets stipulated under Indonesia's Nationally Determined Contribution (NDC). It harnesses appropriate new systems based on advanced digital technologies. All of this will help the government better manage its precious forest heritage, as mandated by Article 33 of the 1945 Constitution, which clearly enshrines forests for the benefit of the people.

Nevertheless, there are challenges that need to be address in the future to ensure the achievement and the sustainability of current efforts including the reduction of deforestation, the improvement of timber production and trade, the rehabilitation of degraded forests and the acceleration of social forestry. Thus, to deal with the challenges, the Ministry of Environment and Forestry has been supported by research and development such as post-fire peatland rehabilitation techniques, the use of environmentally-friendly fertilizers for post-mining rehabilitation, development of prioritized non-timber forest commodities which have been used by communities, the use of oil palm trunks for plywood and timber, carbon accounting methodologies, development of INTROP CC as tropical forest microbe collection center, genetically engineered-high quality seeds for commercial and high value species, and integrated charcoal production technology using liquid smoke and bioactive compost. In addition, the government is currently working on establishing a center for tropical peat ecosystems studies in Bogor, West Java, and will also build an international forensic laboratory for plant and animal species. These facilities will serve as information, learning, and training centers, and a place for strengthening networks.

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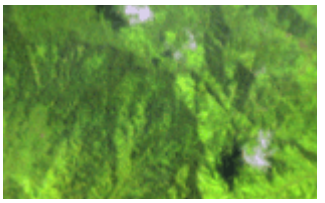
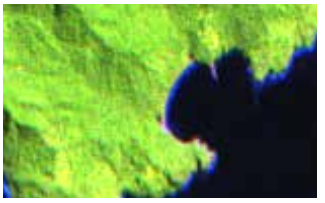
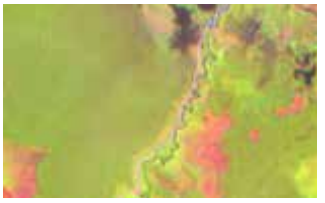
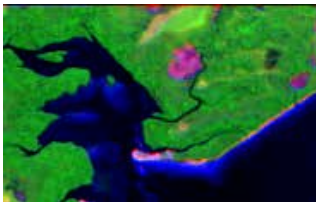
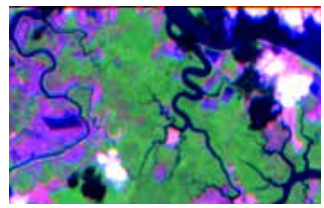
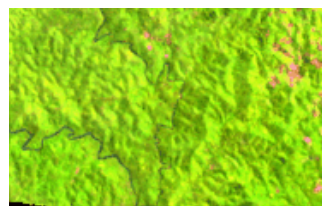
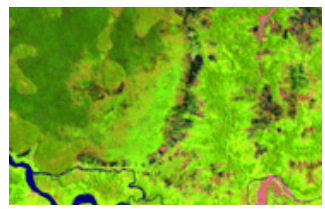
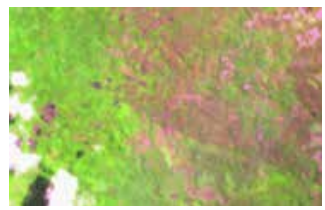
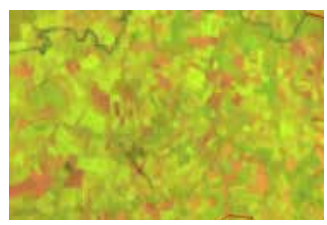
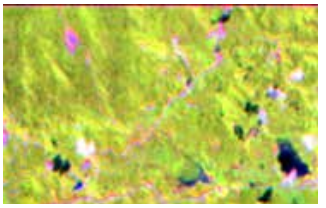
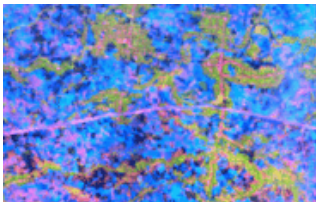
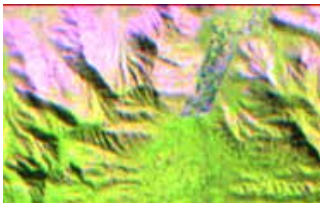
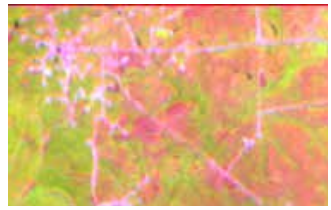
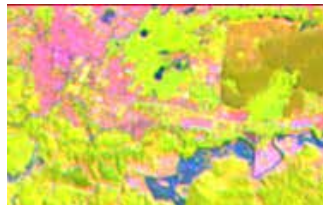
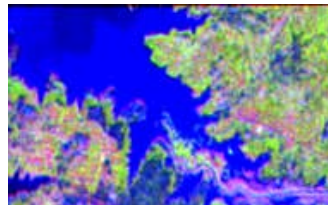
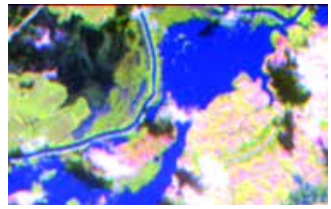
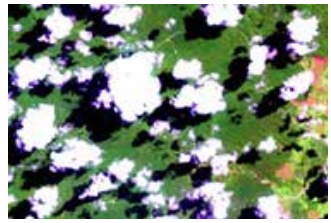
Appendices

Appendix 1: The 23 land cover classes of Indonesia (Margono *et al*., 2016)

Classes	Code	Description	Monogram
FOREST			
Primary dryland forest (*Hutan lahan kering primer*)	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 (*Hutan lahan kering sekunder*)	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 (*Hutan rawa primer*)	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 (*Hutan rawa sekunder*)	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 (*Hutan mangrove primer*)	2004 (Hmp)	*Inundated forest with access to sea/brackish water and dominated by species of mangrove and Nipa (Nipa frutescens) that has no signs of logging activities*	

Secondary mangrove forest (*Hutan mangrove sekunder*)	20041 (Hms)	*Inundated forest with access to sea/brackish water and dominated by species of mangrove and Nipa (Nipa frutescens) that exhibit signs of logging activities indicated by patterns and spotting of logging*	
Plantation forest (*Hutan tanaman*)	2006 (Ht)	*Planted forest including areas of reforestation, industrial plantation forest and community plantation forest*	
NON-FOREST			
Dry shrub (*Semak belukar*)	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 (*Semak belukar rawa*)	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 (*Savanna dan padang rumput*)	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 (*Pure dry agriculture*)	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 2: Nawacita (The Nine National Agendas)

1. Returning the State to its task of protecting all citizens and providing a safe environment, through an active, free foreign policy, reliable national security and the development of an integrated state defense system based on the protection of Indonesia's national interests and the strengthening of its identity as a maritime country.
2. Developing clean, effective, trusted and democratic governance, by prioritizing the restoration of public confidence in democratic institutions through measures to consolidate democracy by reforming political parties, elections, and representative institutions.
3. Developing Indonesia at the periphery through measures to strengthen regions and villages within the framework of the unitary state.
4. Strengthening the nation by reforming its law enforcement system to ensure that it is corruption-free, trustworthy, and dignified.
5. Improving the quality of human life by improving the quality of education and training through a "Smart Indonesia" (*Indonesia Pintar*) program; and improving the people's welfare through "Working Indonesia" (*Indonesia Kerja*) and "Prosperous Indonesia" (*Indonesia Sejahtera*) programs to promote land reform and a nine-hectare land tenure program; a subsidized low-cost housing program; and social security for the people by 2019.
6. Increasing the people's productivity and ability to compete in international markets to ensure that Indonesia can advance and rise with other Asian nations.
7. Promoting economic independence by developing domestic strategic sectors.
8. Improving the character of the nation by reforming the national education curriculum to promote civic education that places an appropriate emphasis on nation-building, patriotic values and love of the country, state defense and character onto the national curriculum.
9. Strengthening the spirit of "unity in diversity" and social reform through policies to promote education on diversity, and by creating inter-community dialogue.

Appendix 3: Nine Development Sub-Agendas Mandated to the Ministry of Environment and Forestry

(1) Water security: Maintain and restore the quality and quantity of water resources and their ecosystems; undertake efforts to decrease river pollution coefficients; reduce the amount of waste entering aquatic environments; improve water quality; improve the protection of water springs; construct galley plugs and control dam; reduce the area of critical land area in areas managed by Forest Management Units (KPH) and in watershed; and restore ecosystems in production forests and conservation forests.

(2) Health: Reduce cancer-causing health risks resulting from heavy metal pollution by improving the management of hazardous and toxic substances and by facilitating the recovery of contaminated soil. Decrease the number of cases of Acute Respiratory Infection (ISPA) resulting from air pollution through measures to improve air quality, including through measures to reduce the number of hotspots resulting from forest and land fires on Sumatra, Kalimantan and Sulawesi.

(3) Food security: Increase the area available for paddy and maize cultivation by 267,000 hectares in forest management units; the establishment of traditional zones covering 100,000 hectares in conservation forests to harvest forest products and/or to support community livelihoods; and to increase the area of land actively managed by communities to support their welfare through the establishment of Community Forests (HKm), Community plantation forest (HTR) and village forests (HD) of 12.7 million hectares.

(4) Energy security: Increase the area of production forest utilized for biomass production by 100,000 ha; increase the use of hydroelectric energy from conservation areas through the establishment of 50 micro hydro power plants; increase the number of partnerships involving the utilization of geothermal environmental services in conservation to at least five units; and increase the use of waste materials for the production of electrical energy.

(5) Tourism: Increase the number of domestic tourists visiting conservation forests by at least 20 million people in five years; increase the number of foreign tourists visiting these forests by least 1.5 million people over the same period;

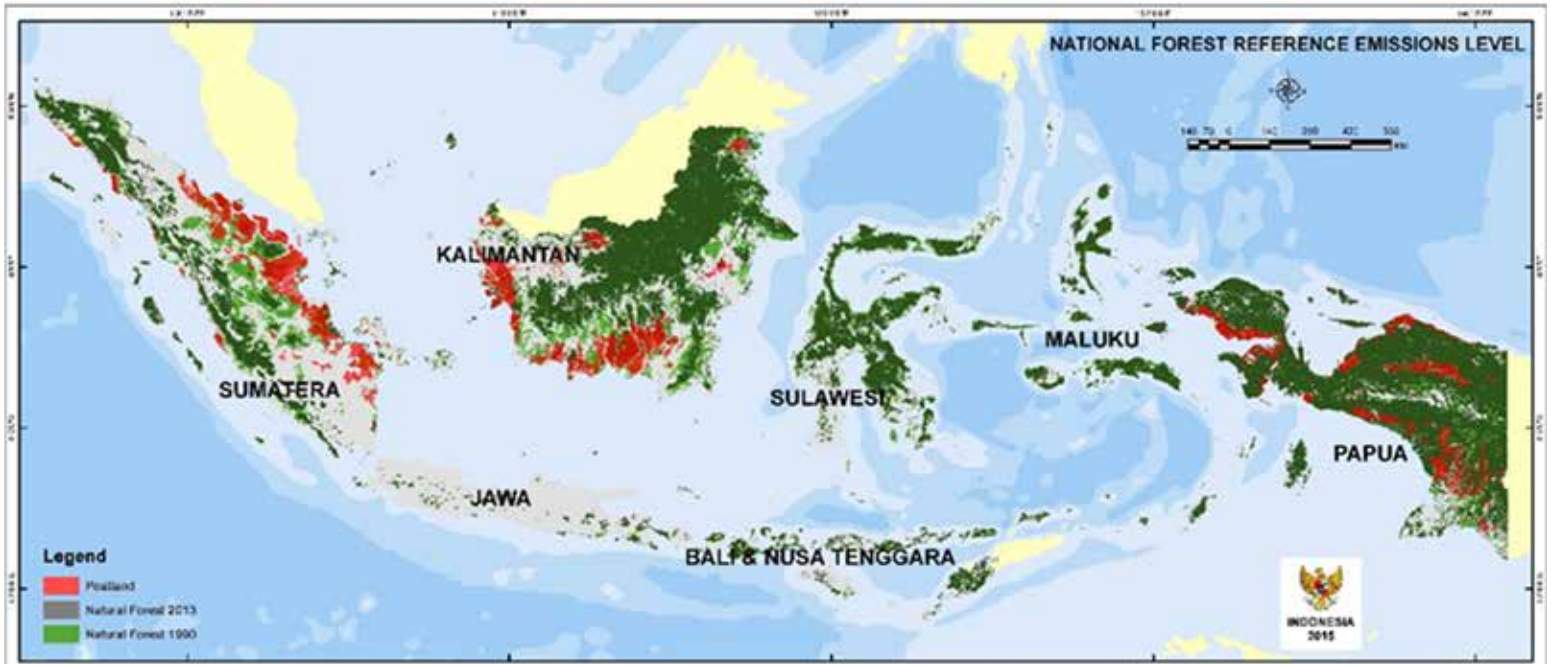
(6) Increased productivity and competitiveness: Increase the number of FMU by 629 units; increase the production of timber from plantations and natural forests by 189 million cubic meters; increase the production of non-timber forest products by 225,000 tons; increase the export value derived by the forestry sector to US$ 40.47 billion; increase the value of exports of wild plants and animals and bioprospecting products to a value of Rp25 trillion; and increase the output of natural forest and NTFP by 15 percent.

(7) Eradicating illegal logging: Reduce the number of violations of environmental and forest laws by 20 percent from the number of cases recorded in 2014.

(8) Conservation of natural resources, protection of the environment and disaster management: Increase the population of identified endangered wildlife species by 10 percent; increase the number of national parks and other conservation areas that service entries for endangered species; increase the number of high-value ecosystem areas outside conservation Forest Areas (six karst ecosystems, six mangrove ecosystems, six conservation area corridors, and 30 biodiversity parks); increase the collection of 300 endemic and rare species; increase the management effectiveness index of KSA, KPA and Hunting Parks to at least 70 percent (good category).

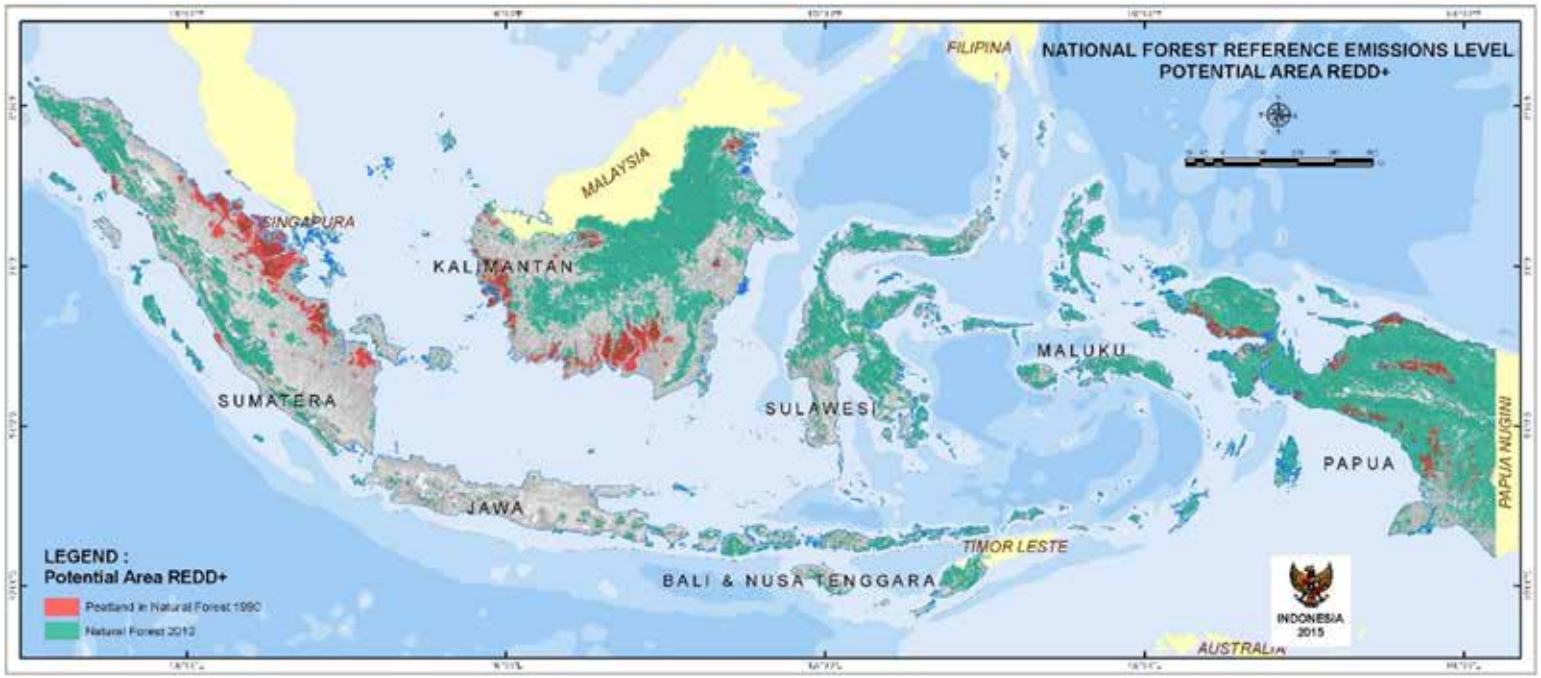
(9) Governance: Increase the percentage of Forest Area with clearly defined boundaries to 100 percent; increase the extent of functional and area boundaries to 40,000 km; increase the number of operating forest management units (KPH) to 629 KPH (347 KPHP, 182 KPHL, and 100 KPHK); increase the number of KPHPs implementing sustainable production forest management principles to 20 KPHPs; increase the area of land allocated for ecosystem restoration to 500,000 ha; increase community access to HKm, HD and HTR management by 12.7 million ha; and increase the number of working areas that have adopted a mangrove forest management model by two working areas each year.

Appendix 4: National FREL Map



Note: National FREL map, covering an area of 113.2 million hectares. the area covered by the map shows areas with natural forest cover in 1990, including both primary and secondary forest cover, both on mineral soils and peatlands.

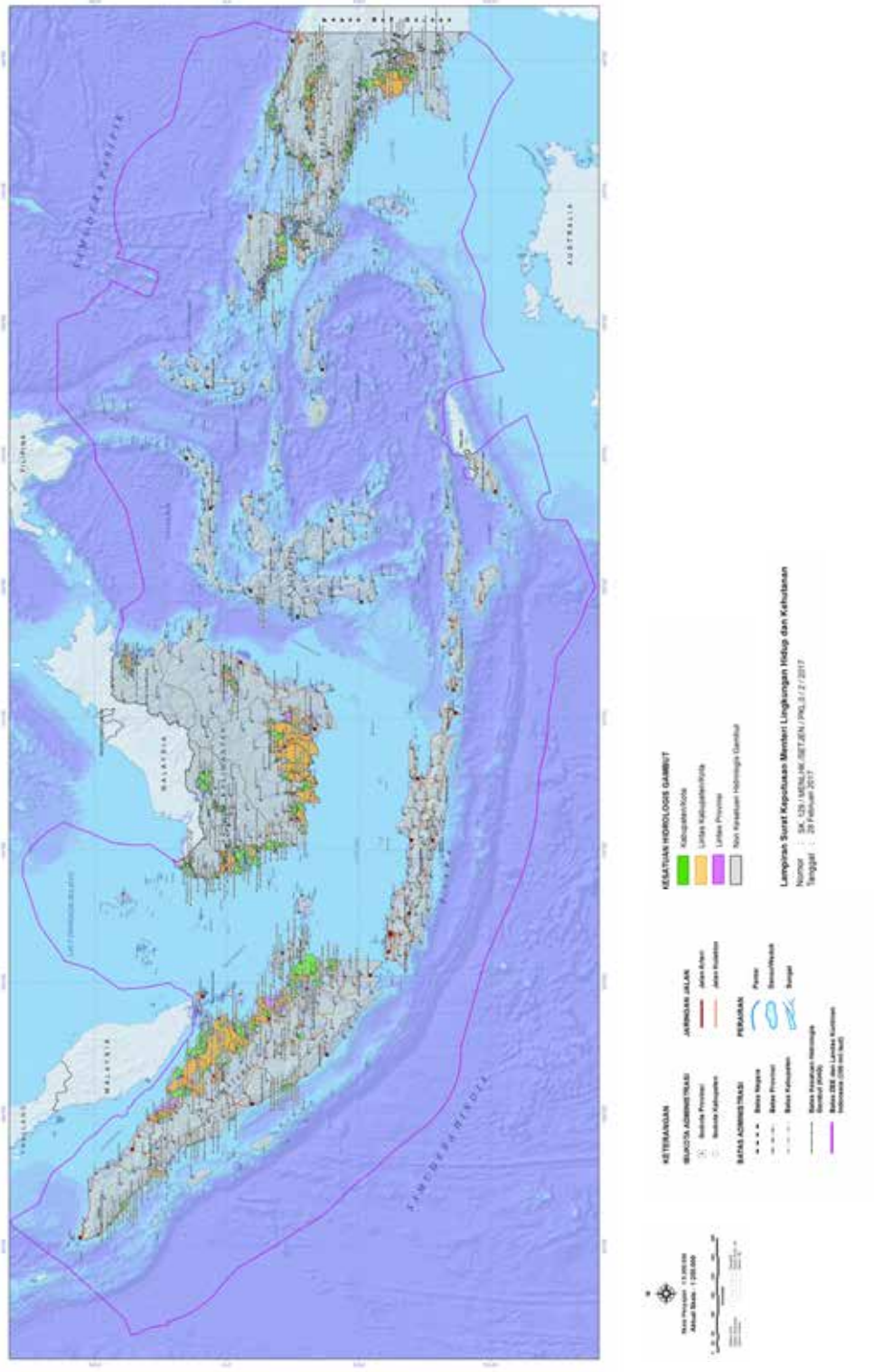
Appendix 5: Map of REDD + Performance Measurement Areas (WPK)



(1) REDD+ WPK include areas with both primary and secondary forest cover in 2012, including both forest on mineral soils and peatlands, including peatlands that had forest cover in 1990 but did not have such forest cover in 2012.

(2) REDD+ WPK must be revised on the basis of reassessments of FREL/National FRL.

Appendix 6: Map of National Peat Hydrological Unit Distribution



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