Working Draft 2022

INDONESIA

Country Profile and Context

AFoCO
Asian Forest Cooperation Organization

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Abbreviations and Acronyms

AATHP	ASEAN Agreement on Transboundary Haze Pollution
AFoCO	Asian Forest Cooperation Organization
AIKO	Automatic Wood Identification Tool
APL	*Area Penggunaan Lain*/ Other Use Areas
ASEAN	Association of Southeast Asian Nations
BP2SDM	*Badan Penyuluhan dan Pengembangan Sumber Daya Manusia/* Extension and Human Resource Development Agency
BPS	*Badan Pusat Statistik*/the Central Berau of Statistic
BRIN	*Badan Riset dan Inovasi Nasional*/National Research and Innovation Agency
COP	Conference of the Parties
CPO	Crude Palm Oil
DPD	*Dewan Perwakilan Daerah*/ the Regional Representatives Council
DPR	*Dewan Perwakilan Rakyat*/the Indonesian House of Representative
FAO	Food and Agriculture Organization
FLEGT VPA	Forest Law Enforcement. Government and Trade-Voluntary Partnership Agreement
FOERDIA	Forest and Environment Research and Development Agency
FREL	Indonesia's National Forest Reference Emission Level
GDP	Gross Domestic Product
HD	*Hutan Desa*/Village Forests
HDI	Human Development Index
HK	*Hutan Konservasi*/Conservation Forest
HKm	*Hutan Kemasyarakatan*/Community Forests
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 Industry*/ Timber Industrial Forest Estate
HTR	*Hutan Tanaman Rakyat*/ Community Plantation Forests
IBSAP	Indonesian Biodiversity Strategy and Action Plan
IDR	Indonesian Dollar Rupiah
IPK	*Izin Pemanfaatan Kayu*/Timber Utilization Permits
ISPO	Indonesian Sustainable Palm Oil
ITPC	International Tropical Peatland Center
IUPHHK-HA	*Izin Usaha Pemanfaatan Hasil Hutan Kayu pada Hutan Alam*/Natural Forest Timber Concession
IUPHHK-HT	*Izin Usaha Pemanfaatan Hasil Hutan Kayu pada Hutan Tanaman*/Timber Estate Concession
KHG	*Kesatuan Hidrologis Gambut*/ Peat Hydrological Unit
KLHK	Kementerian Lingkungan Hidup dan Kehutanan/Ministry of Environment and Forestry
KPA	*Kawasan Pelestarian Alam*/Nature Conservation Area
KPH	*Kesatuan Pengelola Hutan*/Forest Management Unit
KSA	*Kawasan Suaka Alam*/Sanctuary Reserve Area
LDCM	Landsat Data Continuity Mission
MOEF	Ministry of Environment and Forestry

MPA	*Masyarakat Peduli Api*/ society cares about fire
MPR	*Majelis Permusyawaratan Rakyat*/ the People's Consultative Assembly
NDC	Nationally Determined Contribution
NFMS	National Forest Monitoring System
NTFP	Non Timber Forest Products
POLRI	*Polisi Republik Indonesia/* Indonesian National Police
PHPL	*Sertifikasi Pengelolaan Hutan Produksi Lestari/*Sustainable Production Forest Management Certification
RIL-C	Reduced Impact Logging-Carbon
RPJMN	*Rencana Pembangunan Jangka Menengah Nasional/*National Medium-Term Development Plan
SCP	Sustainable Consumption and Production
SDGs	Sustainable Development Goals
SEA	the Strategic Environmental Assessment
SFM	Sustainable Forest Management
SIDIK	*Sistem Informasi dan Data Indeks Kerentanan/* National Vulnerability Index Data and Information System
SIMPEG	*Sistem Informasi Manajemen Kepegawaian/*Personnel Management Information System
SLK	*Sertifikasi Legalitas Kayu*/Certification of Timber Legality
SOIFO	The State of Indonesia's Forests
SPORC	*Satuan Polisi Hutan Reaksi Cepat/* Forest Rangers Quick Response Unit
SVLK	*Sistem Verifikasi Legalitas Kayu*/ Indonesian Timber Legality Assurance System
TORA	*Tanah Objek Reforma Agraria/* National Land Reform Program
TNI	*Tentara Nasional Indonesia/* Indonesian Armed Forces
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
UNDP	United Nations Development Programme
USD	United State Dollar
USGS	The U.S. Geological Survey
UUD 1945	Undang-Undang Dasar/The Fundamental Law of Indonesia built in 1945
VOC	*Vereenigde Oostindische Compagnie*
WB	World Bank

1. Introduction

Indonesia is well known as the "Emerald of the Equator" (*Zamrud Khatulistiwa*), where the 1700+ lined islands dangling in the middle of the equator with 120 million hectares of tropical rainforest area as its emerald pendant. The forest covers 64 percent of nation's entire land area. The country is located between two continents, Asia and Australia, and between two oceans, the Pacific and the Indian Oceans. The geographical location makes Indonesia has rich biodiversity with tropical rainforest and wildlife species. The well-known endemic species from Indonesia are the Sumatran tiger, the Sumatran elephant, the Sumatran and Javan rhinoceros, the Kalimantan orang utan and sumatran orang utan, the new discovered Tapanuli orang utan, the anoa (dwarf buffalo), the komodo dragon and the bird of paradise for fauna. In addition, they also have the endemic flora such as *Rafflesia arnoldi*, matoa (*Pometia pinnata*), agarwood (*Aquilaria microcarpa*), eboni (*Diospyros celebica bakh*), cendana (*Santalum album*), and many rainforest orchids.

The government of Indonesia, through the Ministry of Environment and Forestry, has a commitment to sustainably manage and utilize forest resources to prevent and minimize deforestation and the degradation of forests resource to increase the quality of forests and the environment, and to ensure environmental justice and equal justice and equal opportunity for all members of Indonesia's community to secure better access to forest resources. The commitment carried out through the implementation of system for certification of sustainable management of forest which is also aimed to halt illegal logging; heightening the engagement of specialized unit for law enforcement; and the implementation of a system to resolve conflict and uphold the land rights and forest tenure of communities in surrounding forest areas, including custom communities through Social Forestry Program.

In addition, the government of Indonesia also has a wide range of policies intended to facilitate the effective management of peat ecosystems that are located within industrial plantation forest and large agricultural (especially oil palm) plantation. New policies related to peatland ecosystem are aimed to better prevent peatland fires in both agricultural and forest plantations. Fire prevention and good fires management conducted by engaging stakeholder collaboration to protect nation's forest from any disturbance, especially fires. Indonesia also continues to address climate change mitigation and adaptation through update its Nationally Determined Contribution (NDC) and commits to resolve tenure conflicts related to forest land. Those have been achieved by shifting from a corporate-oriented approach to a more community-oriented approach.[1]

[1] Ministry of Environment and Forestry, Republic of Indonesia. 2020. The State of Indonesia's Forest 2020. Ministry of Environment and Forestry, Republic of Indonesia: Jakarta.

2. Country Overview

2.1. Geographic Profile

The Republic of Indonesia is located between the continents of Asia and Australia. The country extends 5,100 km east to west, and 2,100 km north to south. Lying as it does on the edge of two continental plates, it has large numbers of active volcanoes and is subject to frequent tectonic activity. It comprises 16,056 islands, with 34 provinces spreading over five main islands and four archipelagos. The five main islands include Sumatra, Java, Kalimantan, Sulawesi and Papua. The four archipelagos are Riau, Bangka Belitung, Nusa Tenggara, and Maluku. Papua (319,036.05 sq km) is the largest and the smallest is Daerah Khusus Ibu kota Jakarta (664.01 sq km).

With over 275.20 million people, it is the world's 4th most populous country. Despite its large population and densely populated regions, Indonesia has vast areas of wilderness that support a high level of biodiversity. The country has abundant natural resources like oil and natural gas, coal, tin, copper, gold, and nickel, while agriculture mainly produces rice, palm oil, tea, coffee, cacao, medicinal plants, spices, and rubber. Industrial forestry and logging had greatly contributed in Indonesian economic growth between 1960s and 1990s, however, recent forestry policies has been re-oriented to support reducing degradation and deforestation of Indonesian forests in perspectives of climate change mitigation and biodiversity conservation.

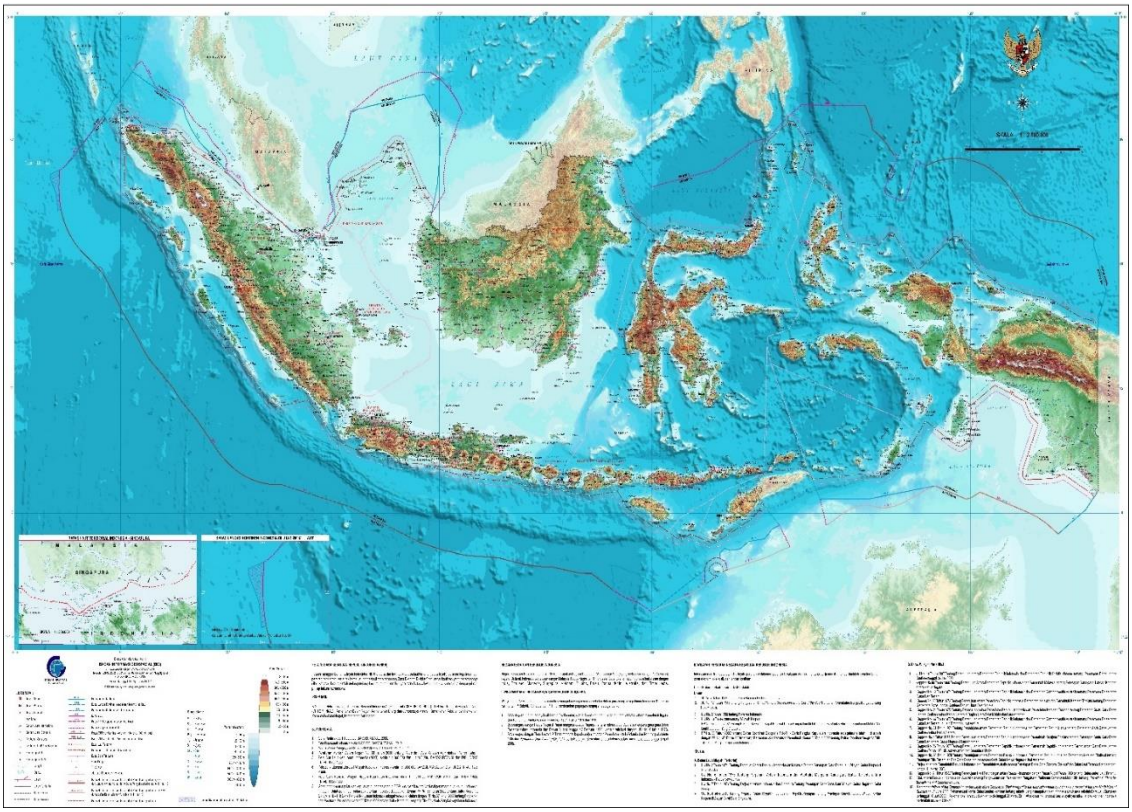


Figure 1 Map of The Republic of Indonesia

Indonesia declared its independency in August 17th 1945 by Soekarno, who become the first President of Indonesia, after the long colonialism of the Dutch East India Company (VOC) and the Japanese invasion and subsequent occupation in 1942-1945. Since the independence day, there are some regime of government[2]. First is the Old Order (*Orde Lama*) under President Soekarno from 1945 until 1965, he is well known as the Founding Father of Indonesia and the Mr. Proclamation (*Bapak Proklamasi*). Then the New Order (*Orde Baru*) under the 2nd President Soeharto who governed 32 years from 1965 until 1998, he is well known as the Mr. Development (*Bapak Pembangunan*). The year of 1998 is the turning point of the era in Indonesia, which is called the Reform Era. This time the government was forced to be changed through scholar and citizen movements demanding new changes that were pro-democracy and free of corruption. This year Indonesia also suffered economic crisis and President Soeharto's resignation. He was replaced by his deputy, Vice President B.J. Habibie, who become the 3rd president of Indonesia. He is well known as the Mr. Democracy and Technology (*Bapak Demokrasi dan Bapak Teknologi*). In 1999, for the first time the People's Consultative Assembly (MPR) elected Abdurrahman Wahid, commonly referred to as "Gus Dur", as the 4th President and Megawati Soekarnoputri as Vice-President. Gur Dur is well known as the Mr. Pluralism (*Bapak Pluralisme*). Then in 2011, student protesters stormed parliament grounds and demanded that President Abdurrahman Wahid resign. Therefore, Megawati Soekarnoputri replaced him and becomes the 5th President of Indonesia. She was the first female President of Indonesia.

In 2004 there was the first-ever direct presidential election in Indonesia and Susilo Bambang Yudhoyono won and become the 6th President of Indonesia. He is well known as the Four Star General (*Jendral Bintang Empat*) due to his background in the military and he was reelected in 2009. In 2014 Joko Widodo was elected become the 7th President of Indonesia through a direct presidential election and reelected in 2019. He was well known as Mr. Renewal and Innovation (*Bapak Pembaharuan dan Inovasi*) who has renewed all state structures, both in reforming the government, economic, political, social, and economic infrastructures.

Official name	Republic of Indonesia
Capital	Jakarta
Population	275,774,000 million [3]
Language	Indonesian (official) and over 700 regional languages
Currency	Indonesian Rupiah (IDR 14.445 per USD, as of April 2021)
Land Area	1,916,906.77 sq km[4]/171.9 million ha (FAO, 2020)
Forest Area	120.3 million ha (MOEF, 2020)/92.1 million ha (FAO, 2020)
GDP per capita	4,291.8 current USD (WB, 2021)
GINI index	37.3 (WB, 2021)
HDI	0.707, 111th rank (UNDP, 2019)
Leader	President Joko Widodo (Served for 2014-2019, Reelected for 2019-2024)

Table 1 Key Facts of Indonesia

[2] https://www.indonesia-investments.com/culture/politics/item65
[3] BPS RI. 2022. Hasil Sensus Penduduk 2021. Badan Pusat Statistik: Jakarta. from https://www.bps.go.id
[4] BPS RI. 2020. Statistik Indonesia 2020. Badan Pusat Statistik: Jakarta. from https://www.bps.go.id

2.2. Government and Administration

The Indonesian Government follows the presidential system based on the Five Principles (Pancasila) Pancasila consists of five principles, namely:

1. Belief in the Almighty God (Ketuhanan Yang Maha Esa);
2. A just and civilized humanity (Kemanusiaan yang Adil dan Beradab);
3. The Unity of Indonesia (Persatuan Indonesia);
4. Citizens, led by collective wisdom in representation (Kerakyatan yang Dipimpin oleh Hikmat Kebijaksanaan dalam Permusyawaratan/Perwakilan);
5. Social equity for all the people of Indonesia (Keadilan Sosial bagi Seluruh Rakyat Indonesia).

The political system in Indonesia is based on Trias Politica principle or separation of legislative, executive, and judicative power. Legislative power is held by the People's Consultative Assembly (MPR, Majelis Permusyawaratan Rakyat) as the highest institution. The MPR members are all The Indonesian House of Representative (DPR, Dewan Perwakilan Rakyat) members plus Regional Representatives Council (DPD, Dewan Perwakilan Daerah). They are elected through a general election and appointed for a five-years membership. The executives consist of president, vice president, and ministerial cabinet. In Indonesia, the ministerial cabinet follows the Presidential Cabinet System where every minister is responsible to the president and does not represent political parties in the parliament. Since the reformation era and after the amendment of UUD 1945, The judicative power has been run by the Supreme Court, including the administrative arrangement of judges.

The government structure of the Republic of Indonesia period 2019–2024 consists of the president, vice president, state supreme agencies, ministerial-level institutions, and non-ministerial institutions. Ministries consist of coordinating ministry and departmental ministry. Coordinating ministries consist of 4 coordinating ministries, namely Coordinating Ministry for Political, Legal, and Security Affairs; the coordinating Ministry for Economy; the Coordinating Ministry for Maritime Affairs; and Coordinating Ministry for Human Development and Culture. Departmental Ministries consist of 30 ministries, including the Ministry of Environment and Forestry. The number of civil servants in Indonesia is about 4.168.118 officers in 2020 (National Civil Service Agency, 2021).

There are 34 provinces in Indonesia led by the Governor. The government under it is the district/city, sub-district, and village respectively. There are 416 districts, 98 cities, 7,094 sub-districts, and 74,957 villages in Indonesia. Based on Law Number 6/2014 concerning Villages, the village government now has an authority to plan and manage the development in their respective villages and have the right to manage the village fund for the welfare of the people. The village fund budget for 2020 is IDR 72 trillion for 74,953 villages, each village gets about IDR 960,6 million for one year. This law has a very significant impact in increasing economic and community development in villages, previously the villages did not have these rights and authorities.

Indonesia is a sovereign state and presidential, constitutional republic with an elected legislature. From the 34 provinces, of which five (Aceh, Jakarta, Yogyakarta, Papua, and West Papua) have special status with greater legislative privileges and a higher degree of autonomy from the central government. The province is the first level of subdivisions, each with its own legislature (*Dewan Perwakilan Rakyat Daerah*, *DPRD*) and an elected governor. The second is the regencies (*kabupaten*) and cities (*kota*), led by regents (*bupati*) and mayors (*walikota*) respectively and legislature (*DPRD Kabupaten/Kota*). The third is the districts (*kecamatan* or *distrik* in Papua), and finally the fourth is the administrative villages (either *desa*, *kelurahan*, *kampong*, *nagari* in West Sumatra, or *gampong* in Aceh). Following the implementation of regional autonomy measures in 2001, regencies and cities have become chief administrative units, responsible for providing most government services.[5]

2.3. People and Population

As an archipelagic country, Indonesia has a population of various types of human races. The various kinds of human races in Indonesia are caused by various factors, one of which is a large number of immigrants in Indonesia since ancient times. Experts say that there is no pure human race in Indonesia except because the result of interbreeding between human races. Some of the races with characteristics that exist in Indonesia are as follows:

- Malayan

The Malayan race is the dominant race in Indonesia because it is spread over almost all the islands in Indonesia, so it is considered as the race that became the ancestor of the Indonesian people. This race has the characteristics of yellow to brown skin color, round face, big eyes, with straight wavy to curly hair.

- Mongoloid

The Mongoloid race is a race that originates from China and is widely spread in big cities in Indonesia such as Jakarta, Surabaya, Semarang, Samarinda, Denpasar, Medan, and several other big cities. This race is characterized by white skin, slanted eyes, and straight hair.

- Veddoid

Weddoid races are races originating from India and Sri Lanka with characteristics of small stature, tan skin, and wavy hair. The tribes in Indonesia who come from this race are the Tomuna Tribe on Muna Island, the Toala Tribe in the Southwest Peninsula of Sulawesi, the Gayo Tribe around Lake Toba, the Sakai Tribe in Siak, the Tomuna Tribe in the Mentawai Islands and the Kubu Tribe in Jambi.[6]

- Kaukasoid

The Caucasoid race in Indonesia is a race that is descended from the Middle East (Arabic), Australia, America, and Europe. Has the characteristics of tall stature, sharp nose, olive skin

[5] Wikipedia (https://en.wikipedia.org/wiki/Indonesia)

[6] https://www.merdeka.com/trending/5-macam-ras-di-indonesia-ketahui-ciri-ciri-dan-persebarannya.html

color. This race is widely spread in North Sumatra, such as Sibolga, Binjai, Medan, Pematang Siantar, Tebing Tinggi, and Tanjung Balai.

- Melanesoid

This race has almost the same physical characteristics as the Negroid race with characteristics of black skin, curly hair, and a stocky stature. Melanesoid race lives in Papua, Maluku, and East Nusa Tenggara.[7]

Indonesia also has the fourth largest population in the world with a population of 275,774,000 people (BPS, July 2022), with high population growth at 1.25%. 58% of the population lives in Java, the world's most populous island. The country currently possesses a relatively young population, with a median age of 30.2 years (2017 estimate). About 8 million Indonesians live overseas – most settled in Malaysia, Netherlands, Saudi Arabia, United Arab Emirates, Hong Kong, Singapore, the United Sates, and Australia.[8]

2.4. Sociocultural Context

The culture of Indonesia has been shaped by long interaction between original indigenous customs and multiple foreign influences. Indonesia is centrally-located along ancient trading routes between the Far East, the South Asia, and the Middle East, resulting in many cultural practices being strongly influenced by a multitude of religions, including Buddhism, Christianity, Confucianism, Hinduism, and Islam, all strong in the major trading cities. The result is a complex cultural mixture very different from the original indigenous cultures. Examples of the fusion of Islam with Hinduism include *Javanese Abangan* belief. Balinese dances have stories about ancient Buddhist and Hindu kingdoms, while Islamic art forms and architecture are present in Sumatra, especially in the Minangkabau and Aceh regions. Traditional art, music and sport are combined in a martial art form called *Pencak Silat*. The Western world has influenced Indonesia in science, technology and modern entertainment such as television shows, film, and music, as well as political system and issues. India has notably influenced Indonesian songs and movies. A popular type of song is the Indian-rhythmical *dangdut*, which is often mixed with Arab and Malay folk music.

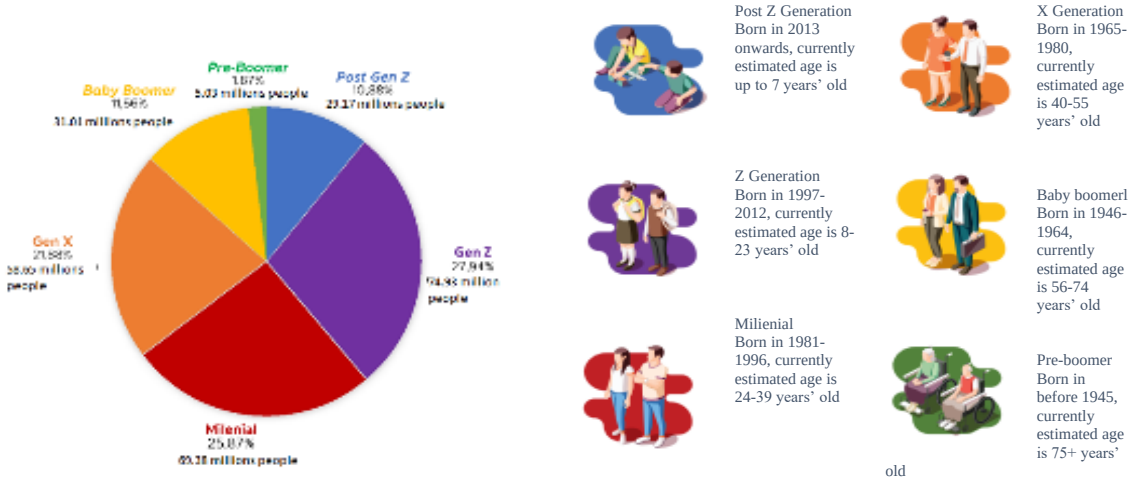
Despite the influences of foreign culture, some remote Indonesian regions still preserve uniquely indigenous culture. Indigenous ethnic groups *Mentawai, Asmat, Dani, Dayak, Toraja* and many others are still practicing their ethnic rituals, customs and wearing traditional clothes. There are 1,340 ethnic tribes and the Javanese is the largest ethnic group which covers 40.2 percent of Indonesia's population. Each ethnicity has their own language and several different dialects. There are six religions recognized by the Indonesian government namely Islam, Protestantism, Catholicism, Hinduism, Buddhism and Confucianism. Islam is the majority consist of 87.2% of the population. Although diverse, Indonesian society has a high tolerance and mutual respect for differences. The slogan held by all Indonesian people is the *Bhineka Tunggal Ika,* which means Unity in Diversity. In addition, Indonesia has a culture of kinship, mutual cooperation, deliberation, and amicable

[7] https://www.kompas.com/stori/read/2021/10/12/143037579/macam-macam-ras-yang-ada-di-indonesia?page=all
[8] Wikipedia (https://en.wikipedia.org/wiki/Indonesia)

friendly.[9] Indonesia consists of hundreds of distinct native ethnic and linguistic groups, with the largest – and politically dominant – ethnic group being the Javanese (40.2% of the population). The Sundanese, Batak, and Madurese are the largest non-Javanese groups. A sense of Indonesian nationhood exists alongside strong regional identities. Indonesia's national motto, "Bhinneka Tunggal Ika" ("Unity in Diversity", literally, "many, yet one"), articulates the diversity that shapes the country.[10]

From a rural to an urban economy. By 2025, Indonesia is expected to have 68% of its population living in cities. While urbanization is occurring at a higher rate in Indonesia than the other emerging economies, Indonesia has not been gaining full benefits from its urbanization growth due to the congestion, pollution, and disaster risks resulting from insufficient infrastructure investment.[11] Also increasing population disparity between urban and rural areas has also been creating a gap in wealth, unemployment rate, and health among them.[12]

The percentage of the population of productive age (15-64 years) has continued to increase since 1971. In 1971 the proportion of the population of productive age was 53.39 percent of the total population and increased to 70.72 percent in 2020. With such a population structure, Indonesia is still at the window of opportunity to enjoy the demographic bonus. The population structure can be a form of development capital when the number of productive age population is very large. The SP2020 results noted that the majority of Indonesia's population is dominated by Generation Z and Millennial Generation. The proportion of Generation Z is 27.94 percent of the total population and Millennial Generation is 25.87 percent of the total population of Indonesia. These two generations are included in the productive age which can be an opportunity to accelerate economic growth[13].



Source of classification William H. Frey analysis of Census Bureau Population Estimates (25 June, 2020) in BPS, 2021

Figure 2 The Indonesian Population Composition Based on Age

[9] https://www.kemdikbud.go.id/
[10] Wikipedia (https://en.wikipedia.org/wiki/Indonesia)
[11] World Bank (https://www.worldbank.org/en/news/feature/2016/06/14/indonesia-urban-story)
[12] Wikipedia (https://en.wikipedia.org/wiki/Indonesia)
[13] BPS RI. 2021. Berita Resmi Statistik no. 7/01/Th XXIV, 21 Januari 2021.

2.5. Economic situation

Indonesia has charted impressive economic growth since overcoming the Asian financial crisis of the late 1990s. The country's GDP per capita has steadily risen, from $807 in the year 2000 to $3,877 in 2018. Today, Indonesia is the world's 7th largest economy in terms of GDP at purchasing power parity and a member of the G-20. An emerging middle-income country, Indonesia has made enormous gains in poverty reduction, cutting the poverty rate to more than half since 1999, to 9.8% in 2018.

Despite heightened global uncertainty, Indonesia's economic outlook continues to be positive, with domestic demand being the main driver of growth. Supported by robust investment, stable inflation, and a strong job market, Indonesia's economic growth is forecast to reach 5.2% in 2019.[14]

Indonesia's economic planning follows a 20-year development plan, spanning from 2005 to 2025. It is segmented into 5-year medium-term plans, called the RPJMN (*Rencana Pembangunan Jangka Menengah Nasional*) each with different development priorities. The current medium-term development plan – the third phase of the long-term plan – runs from 2015 to 2020. It focuses on, among others, infrastructure development and social assistance programs related to education and health care. Such shifts in public spending have been enabled by the reform of long-standing energy subsidies, allowing for more investments in programs that directly impact the poor and near-poor.[15]

2.6. Climate and Biodiversity

2.6.1. Climate

Geographically, Indonesia is located between 60 04' 30'' North latitude and 110 00' 36'' South latitude, and between 940 58' 21'' and 1410 01' 10'' East longitude, and lies on equator line located at 00 latitude line. In terms of geographic position, Indonesia has boundaries as follows: North - Malaysia, Singapore, Vietnam, Philippines, Thailand, Palau, and South China Sea; South - Australia, Timor Leste, and Indian Ocean; West - Indian Ocean; East - Papua New Guinea and Pacific Ocean. The boundaries spread on 111 outermost islands of Indonesia that must be well managed and guarded. The outermost islands are immediately adjacent to other countries and have strategic sovereignty values that should be strengthened.

In terms of geographic location, Indonesia is located between Asian Continent and Australian Continent, and between Indian Ocean and Pacific Ocean. As an archipelagic country, Indonesia consists of thousands of islands interconnected by straits and seas. Currently, there are 13,466 islands that have been registered. Total area of Indonesia is 1.9016.906,77 sq.km with number of islands 16.056 islands, with 12.857 village in coastal area and 71.074 villages in non-coastal area. Indonesia has 34 provinces spreading over five main islands and four archipelagos. These include:

[14] Wikipedia (https://en.wikipedia.org/wiki/Indonesia)
[15] The World Bank in Indonesia. https://www.worldbank.org/en/country/indonesia/overview

- Sumatera Island: Aceh, Sumatera Utara, Sumatera Barat, Riau, Jambi, Sumatera Selatan, Bengkulu, and Lampung.
- Riau Archipelago: Kepulauan Riau.
- Bangka Belitung Archipelago: Kepulauan Bangka Belitung.
- Jawa Island: Jakarta, Jawa Barat, Banten, Jawa Tengah, Yogyakarta, and Jawa Timur.
- Nusa Tenggara Archipelago (Sunda Kecil): Bali, Nusa Tenggara Barat, and Nusa Tenggara Timur.
- Kalimantan Island: Kalimantan Barat, Kalimantan Tengah, Kalimantan Selatan, Kalimantan Timur and Kalimantan Utara.
- Sulawesi Island: Sulawesi Utara, Gorontalo, Sulawesi Tengah, Sulawesi Selatan, Sulawesi Barat, and Sulawesi Tenggara.
- Maluku Archipelago: Maluku and Maluku Utara.
- Papua Island: Papua and Papua Barat.

2.6.2. Biodiversity

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

Indonesia has the greatest biodiversity in the world after Brazil and Colombia. Indonesia contains 13 land-based ecosystems and six aquatic ecosystems (including both freshwater and marine ecosystems). Within these 19 ecosystems, there are 74 systems of vegetation types. As explained in the Indonesian Biodiversity Strategy and Action Plan (IBSAP) 2015-2020, the nation is blessed with 1,605 recorded bird species; 723 reptile species; 385 amphibian species; 720 mammal species; 1,248 freshwater fish species; 197,964 invertebrate species; 5,137 arthropod (spider) species; 151,847 insect species including 30,000 from the hymenoptera order (wasps, bees and ants).

In terms of plant life, there are 91,251 species of spore-based plants. Of plants that produce seeds (*spermatophytes*), there are 120 species of vascular plants that produce exposed seeds (*gymnosperms*) and an estimated 30,000 to 40,000 species of flowering plants (*angiosperms*), of which only 19,112 species have been identified so far. Indonesia's wildlife includes the sumatran tiger (*Panthera tigris sumatrae*), the sumatran elephant (*Elephas maximus sumatrensis*), the sumatran rhinoceros (*Dicerorhinus sumatrensis*), the javan rhinoceros (*Rhinoceros sondaicus*), the kalimantan orangutan (*Pongo pygmaeus*), the sumatran orangutan (*Pongo abelii*), anoa (*Bubalus quarlesi*) in Sulawesi, the komodo dragon (*Varanus komodoensis*) in East Nusa Tenggara and the bird of paradise (Paradisaea apoda) in Papua.

3. Major Trends and Issues in Forest and Forestry

3.1. State of Forest

3.1.1. Land Use and Forest Cover

Forest in Indonesia[16] has a definition 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*". This working definition has been recognized by the UNFCCC through its approval of Indonesia's National Forest Reference Emission Level (FREL) for Deforestation and Forest Degradation.

Under Indonesian law, the area legally designated as "Forest Area" (*Kawasan Hutan*) is under the jurisdiction of the Ministry of Environment and Forestry. The Forest Area has areas that are both covered by forest or "forested" (*berhutan*) and not covered by forest or "not forested" (*tidak berhutan*). Similarly, public lands that are categorized under Indonesian law as "Other Use Areas" (*Areal Penggunaan Lain, APL*) can be both forested or not forested. The full extent of Indonesia's forest is usually referred to as the forested area (*areal berhutan*) or forest cover area (*luas tutupan hutan*), a term that encompasses both the Forest Area and APL. On land designated as Forest Area and APL, land cover may take several different forms, including natural forests (consisting of primary forest and secondary forest), plantation forest, plantation/estate crops, agriculture, shrub, settlements, and various others. There are 23 land cover categories in Indonesia and these are used for forest and forest resource monitoring. (MOEF, 2021).

Indonesia's total land area is around 190 million hectares (ha), of which some 55 million ha are agricultural, and 129 million ha is forest. Of the agricultural land, 24 million ha consist of arable land, with 20 million ha under permanent crops. Some 7 million ha, or 30% of the total arable land, are irrigated.[17]

The rapid expansion of land-based sectors, growing population and fast urbanization have had adverse effects on the environment and livelihoods of local communities. Unsustainable practices in the land-use sector have been major causes of environmental degradation and greenhouse gas (GHG) emissions.

Degraded land in Indonesia was estimated to 24.3 million ha in 2013, which was attributed to inappropriate land use, no soil and water conservation measures applied in such areas entailed to sever erosion, sedimentation and degradation of water condition in the downstream area. Indonesia aims to achieve Land Degradation Neutrality by 2040.[18]

[16] The Decree of the Minister of Forestry of Indonesia, No. 14 of 2004
[17] ADB, 2015. Summary of Indonesia's Agriculture, Natural Resources, and Environment Sector Assessment, p. 3
[18] Ministry of Environment and Forestry, 2015. Land Degradation Neutrality National Report

For the Forest Cover Served by following data:

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. Forested	17.4	24.0	21.4	17.8	80.6	6.3	86.9	7.2	94.1	50.1
- Primary Forest	12.5	15.9	9.8	4.7	42.7	2.5	45.3	1.5	46.8	24.9
- Secondary Forest	4.8	7.8	11.3	9.7	33.6	3.7	37.3	4.9	42.2	22.5
- Plantation Forest	0.1	0.3	0.4	3.5	4.3	0.0	4.3	0.8	5.1	2.7
B. Non-Forested	4.5	5.6	5.4	11.4	26.8	6.5	33.4	60.3	93.6	49.9
Total Terrestrial Area	21.9	29.6	26.8	29.2	107.4	12.8	120.3	67.5	187.8	100.0
% Forested Area	**79.6**	**81.0**	**80.0**	**61.0**	**75.0**	**49.1**	**72.2**	**10.7**	**50.1**	

Notes: HK-Conservation Forest; HL-Protection Forest; HPT-Limited Production Forest; HP-Permanent Production Forest; HPK-Convertible Production Forest; APL-Other Use Area/Non-Forest Area. Source: MoEF (2020a)

Table 2 Extent of Land Cover Types in Forest Area and Non-Forest Area in Indonesia (2019)

Based on a reassessment of land cover conducted in 2019 using image interpretations derived from the Landsat Data Continuity Mission (LDCM)/ Landsat 8 OLI for 2019 coverage, 79.6 percent of Indonesia's conservation forest area; 81.0 percent of its protection forest area; and 80.0 percent of its limited production forest area are covered by forest. In permanent production forest areas, the forest cover is 61.0 percent, while in convertible production forest areas, the figure is 49.1 percent. Another form of forest is planted forest, land cover with trees developed by humans that fulfill the definition of forest, either Industrial Plantation Forests or reforestation and re-greening activities within and outside the forest area. The remaining land cover types found in all the forest area are estate crops, agriculture, shrub, settlements, etc. which are classified as non-forested areas or areas without forest cover.

3.1.2. Forest Use Categories

120.6 million hectares (63 percent of total land area) of land in Indonesia is designated as National Forest Area (Kawasan Hutan), with most of the remaining public land being designated for other purposes (*Areal Penggunaan Lain, APL*). In addition, 5.3 million hectares of its territorial waters have been designated as marine conservation areas (*kawasan konservasi perairan*) within the mandate of the Ministry of Environment and Forestry. These public forests and marine conservation areas are designated as the Forest Area and Marine Conservation Areas.

The forest area is managed in accordance with three functions - Production Forests (Hutan Produksi, HP) which covers a total area of 68.8 million hectares (57% of forest area),

Conservation Forests (Hutan Konservasi) which is 22.1 million hectares (18%), and Protection Forests (Hutan Lindung) which has a function of watershed conservation and covers 29.7 million hectares (25%).[19]

The majority of Indonesian forest lands are considered to be owned by the government. These are generally managed by public administrators and business entities with limited ownership rights. The amount of land managed by communities is unknown, however "*adat*" means that forests are located in traditional jurisdiction areas. While Forestry Law 41/1999 states that Indigenous forest laws will be respected, a recent constitutional court decision indicates that community lands may in fact not fall under the Ministry of Forestry jurisdiction at all.[20]

Indonesian forests face significant degradation and deforestation pressure from oil palm and other large agricultural and forestry operations, mining, and infrastructure. While the rate of forest cover change continues to be debated, land use change emissions – including those from net deforestation and peat fires – are estimated to contribute to about 85% of Indonesia's greenhouse gas emissions.[21]

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

Figure 3 Areas Allocated to various land uses in the forest land and marine conservation

The conservation forest area is categorized into Sanctuary Reserve Areas (*Kawasan Suaka Alam, KSA*) and Nature Conservation Areas (*Kawasan Pelestarian Alam, KPA*). KSA consist of Strict Nature Reserves (*Cagar Alam*) and Wildlife Sanctuaries (*Suaka Margasatwa*). Meanwhile, KPA consist of National Parks (*Taman Nasional*), Nature Recreation Parks (*Taman Wisata Alam*), and Grand Forest Parks (*Taman Hutan Raya,*

[19] MOEF, 2018. The State of Indonesia's Forests 2018
[20] WRI website: https://www.wri.org/our-work/project/governance-forests-initiative/indonesia
[21] WRI website: https://www.wri.org/our-work/project/governance-forests-initiative/indonesia

Tahura). KSA/ KPA can be terrestrial or marine. All types of KSA/KPA with a majority of area on land are classified as terrestrial KSA/KPA (*KSA/ KPA darat*) and cover a total of 22.1 million hectares. On the other hand, all types of KSA/ KPA where the majority of the area is located in the sea are classified as marine KSA/KPA (*KSA/KPA perairan*) and cover a total of 5.3 million hectares. One of the most famous terrestrial KPAs in Indonesia is Komodo National Park, the home of the unique and rare Komodo Dragon (*Varanus komodoensis*), and a UNESCO world heritage site. World famous Indonesian marine conservation areas include Bunaken National Park, Wakatobi National Park, and Raja Ampat Marine Protected Area.

3.1.3. Main Drivers of Forest Changes

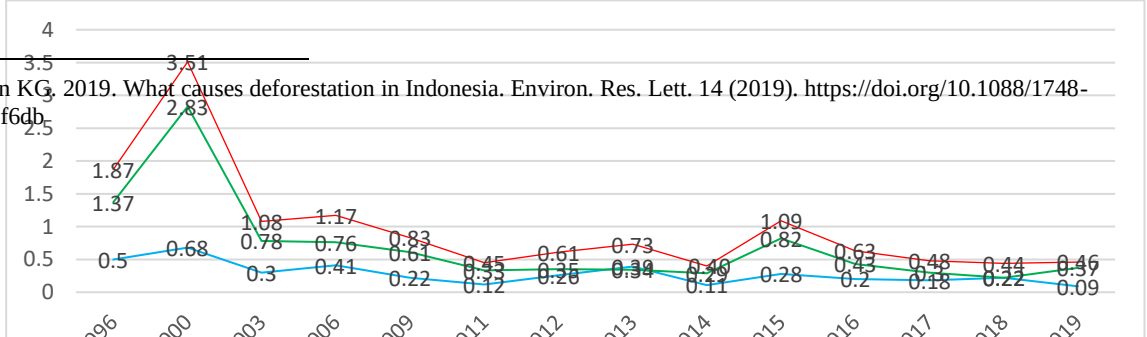
Land cover in forest areas, particularly forest cover, is dynamic and subject to rapid change, with both the condition and the extent of forest cover declining. Several factors contribute, including the conversion of forest areas for use by other sectors; unsustainable management of forests; illegal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

The study of Austin et al, 2019[22] reveals that the main driver of deforestation in Indonesia is Oil Palm (23%) of deforestation nationwide, even it reached almost 40% in 2008-2009. The expansion of timber and other large-scale plantations together resulted in 21% of national deforestation (14% and 7%, respectively).

Driver	Area (ha)	Propotion (%)	90% CI
Oil palm plantation	2,080,978	23%	(18%–25%)
Timber plantation	1,26,028	14%	(10%–17%)
Large-scale plantation	616,208	7%	(5%–10%)
Grassland/shrubland	1,840,884	20%	(16%–24%)
Small-scale agriculture	1,361.784	15%	(12%–16%)
Small-scale mixed plantation	662,418	7%	(6%–9%)
Logging road	257,391	4%	(4%–5%)
Secondary forest	554,617	6%	(5%–7%)
Mining	219,987	2%	(1%–3%)
Fish pond	71,717	1%	(0%–1%)
Other	157,619	2%	(1%–2%)

Source, Austin et.al., 2019

Table 3 The area (ha) and proportion (%) of deforestation nationwide from 2001-2016 were caused by each driver category



[22] Austin KG. 2019. What causes deforestation in Indonesia. Environ. Res. Lett. 14 (2019). https://doi.org/10.1088/1748-9326/aaf6db

Source: MoEF (2020a)
Figure 4 The Trend of Deforestation in Indonesia

3.2. Forest Policy Direction and Strategies

3.2.1. Forest Legislations

The legal basis of natural resources legislation in Indonesia is the Basic ACT 1945 Article 33 that stated the earth, soil, water, and wealth contained therein controlled by the state and used for the people's welfare. While for forest legislations in Indonesia regulated under the Law of the Republic of Indonesia No. 41 of 1999 concerning on Forestry. This Forestry Law came into effect in 2000, and regulates the management of forests in Indonesia. Forestry Law No. 41 of 1999 replaced the Basic Forestry Law (Law No. 5 of 1967), which had focused mainly on timber management, and not conservation. Article 4 Para (1) stated that all forests in the authority of the Republic of Indonesia, including the natural resources therein are governed by the State for the greatest welfare of the people. Article 4 Para (2) stated that the authorities of the government (Ministry of Forestry and Environment) are (a) to govern and manage all affairs related to forests, forests areas, and forest products; (b) to determine or change the category of certain lands as forest areas or otherwise; and (3) to administer and determined legal relations between people and forests, and legal undertakings related to the forests.

In addition, there is the other Laws related to Forestry Indonesia, namely:

1) Law No. 5 of 1967 on Basic Provisions of Forestry
2) Law No 5 of 1990 on Conservation of Natural Resources and Their Ecosystems
3) Law No. 17 of 2003 on State Finance.
4) Law NO. 18 of 2004 on Plantation
5) Law No. 26 of 2007 on Spatial Planning.
6) Law No. 14 of 2008 on Public Information Disclosure.
7) Law No. 32 of 2009 on Environmental Protection and Management**.**
8) Law No. 4 of 2009 on Mineral and Coal Mining
9) Law No. 4 of 2011 on Geospatial Information
10) Law No. 18 of 2013 on the Prevention and Eradication of Forest Degradation.

11) Law No. 6 of 2014 on Villages**.**
12) Law No. 23 of 2014 on Regional Governance.
13) Law No 11/2020 on Job Creation in other term is Omnibus Law.
14) Presidential Decree for MoEF (Ministry of Environment and Forestry): Number 92/2020 about The Ministry of Environment and Forestry.
15) Ministerial Regulation (MoEF), Number 15/2021 about Organization and Working Procedure.

The forest policy directions and strategies in Indonesia for 5 years are contained in the Strategic Plan (*Rencana Strategis*). The latest strategic plan is for 2020-2024[23]. Strategic targets that have been agreed upon and will be achieved in 2020-2024 by the Ministry of Environment and Forestry are:

1. The realization of a quality and responsive forest and living environment against climate change with indicators, namely: (1) Quality Index Environment (IKLH), (2) Reduction of Greenhouse Gas (GHG) Emissions verified in the Forestry and Waste Sector, (3) Decreasing rate Deforestation, (4) Solid Waste Management Performance Index (IKPS), (5) Land area in a restored watershed condition, and (6) the area of value High Conservation (HCV);
2. The achievement of optimal utilization of forest and environmental resources in accordance with the carrying capacity and carrying capacity of the environment, with indicators namely: (1) Contribution of the Environment and Forestry Sector to GDP National, (2) Export Value of Forest Products, TSL and Bioprospecting, and (3) Increase in the Value of Functional Non-Tax State Revenues (PNBP) of the Ministry of Environment and Forestry;
3. The existence, function and distribution of forest benefits in an equitable manner and sustainable, with indicators, namely: (1) Extent of forest area with Status of Determination, (2) Area of Forest Area Released for TORA (Land Agrarian Reform Objects), and (3) Extent of Forest Areas Managed by Public;
4. The implementation of Environmental Development Governance and Innovation and Good Forestry (LHK) as well as the Competence of Empowered LHK Human Resources Competitiveness, with indicators, namely: (1) Area Management Effectiveness Index forest, (2) Number of LHK Cases Handled through Law Enforcement, (3) Electronic Based Government System Index (Index-SPBE), (4) Results Innovative and / or Implementative R & D, (5) Reform Performance Value Bureaucracy, (6) WTP Opinion on KLHK Financial Statements, (7) Productivity Index and LHK HR Competitiveness, and (8) Maturity Level of SPIP (Control System Government Intern) KLHK.

3.2.2. Institutional Settings for National Forest Management

The Forestry Law number 41 of 1999 reaffirms the Ministry of Forestry as the lead authority at the national level for almost all things related to forests. The text (Article 4, Paragraph (2) says that the responsibilities of the Government (Minister of Environment and Forestry) are to Govern and manage all affairs related to forests, forest areas, and forest

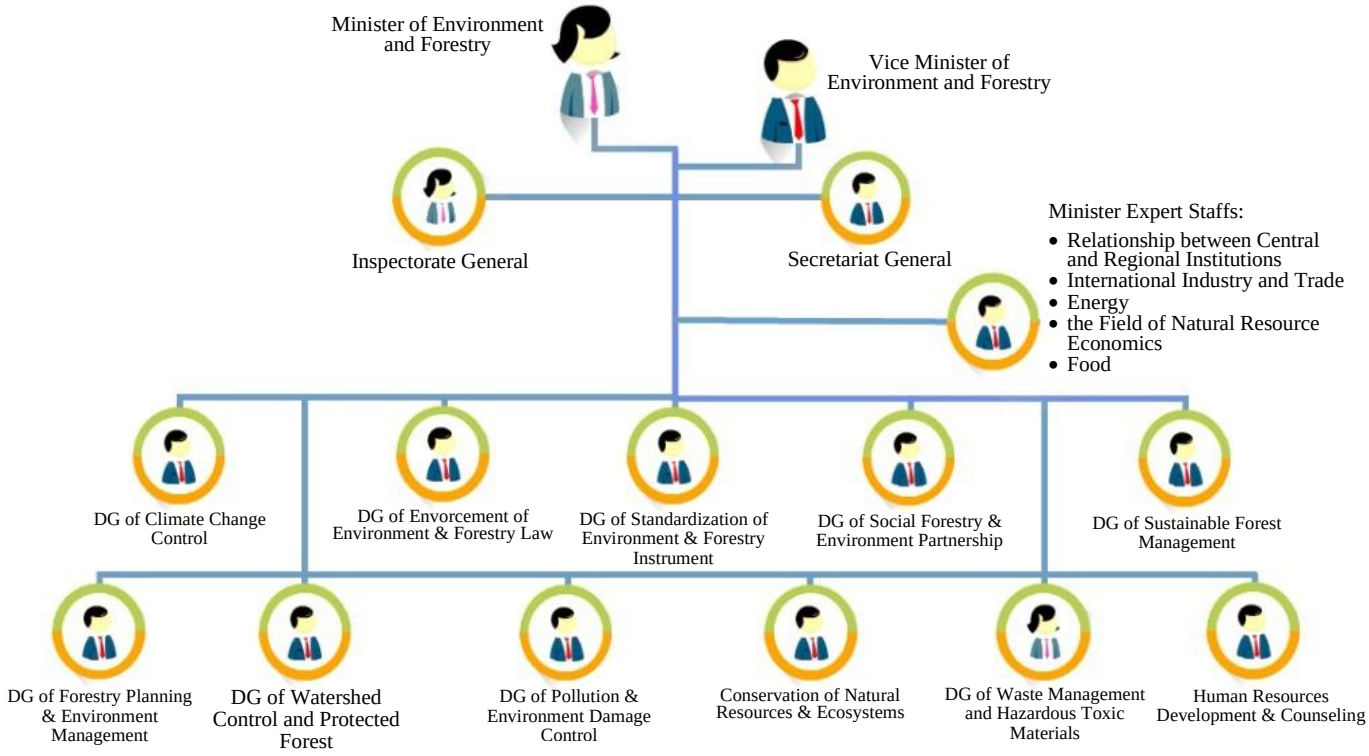
[23] Ministry of Environment and Forestry. 2020. Rencana Strategis tahun 2020-2024. Lampiran Peraturan Menteri Lingkungan Hidup dan Kehutanan Republik Indonesia Nomor .16/menlhk/setjen/set.1/8/2020 tentang Rencana Strategis Kementerian Lingkungan Hidup dan Kehutanan tahun 2020-2024.

products; Determine or change the category of certain lands as forest areas or otherwise; and Administer and determine legal relations between people and the forests, and legal undertakings related to the forests.

In accordance with the mandate of the Presidential Decree, Number 92/2020 The Ministry of Environment and Forestry has the task of carrying out government affairs in the field of environment and forestry to assist the President in administering state government. In carrying out the tasks as mentioned above, the Ministry of Environment and Forestry carries out the following functions:

a. Formulation, stipulation and implementation of policies in the field of implementing forest area consolidation and environmental management in a sustainable manner, management of conservation of natural resources and their ecosystems, increasing the carrying capacity of watersheds and forest rehabilitation, sustainable forest management, increasing competitiveness of forest product primary industries, controlling pollution and environmental damage, waste management, hazardous and toxic materials, and hazardous and toxic waste materials, climate change control, forest, and land fire control, social forestry and environmental partnerships, as well as law enforcement in the environmental and forestry sectors;
b. Coordination and synchronization of policy implementation in the field of sustainable environmental management, increasing the carrying capacity of watersheds and forest rehabilitation, controlling pollution and environmental damage, managing waste, hazardous and toxic materials, and hazardous and toxic waste materials, controlling climate change, controlling fires forest and land, environmental partnerships, and law enforcement in the field of environment and forestry;
c. Coordination of the implementation of tasks, development, and provision of administrative support to all organizational elements within the Ministry of Environment and Forestry;
d. Management of state property/wealth which is the responsibility of the Ministry of Environment and Forestry;
e. Supervision the implementation of tasks within the Ministry of Environment and Forestry;
f. Implementation of technical guidance and supervision of the implementation of the affairs of the Ministry of Environment and Forestry in the regions; and
g. Implementation of substantive support to all organizational elements within the Ministry of Environment and Forestry.

In carrying out its duties, the Minister of Environment and Forestry is assisted by thirteen (13) Directorate Generals levels and five (5) Ministerial Expert Staff as shown in the following organizational structure:



Source: Rencana Strategis KLHK Tahun 2020-2024/ Strategic Plan of MoEF, 2020-2024

Figure 5 Organogram Structure of MoEF the Republic of Indonesia

Additional information about institutional settings for national forest management, namely:

1) ***Law No. 23 of 2014 on Regional Governance.*** This law withdraws the authority over natural resource management from district and city governments and shifts it to provincial and national-level governments.
2) ***Law No. 6 of 2014 on Villages***. This law has enormous implications for the forestry sector by expanding the authority of villages to manage their own assets and natural resources, revenue and administration. It specifically reallocates a specific portion of the State budget to village administrations, providing all of Indonesia's villages with annual discretionary funding for making local improvements that support poverty alleviation, health, education and infrastructure development.
3) **Establishement of Forest Management Unit (FMU)** for site level management. The paradigm is shifting from access to licenses for forestry corporations to one that also expands community access. Local communities may be involved in Production Forest management through non-license forest utilization schemes by partnering with FMU.

3.2.3. Forest Tenure and Governance

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

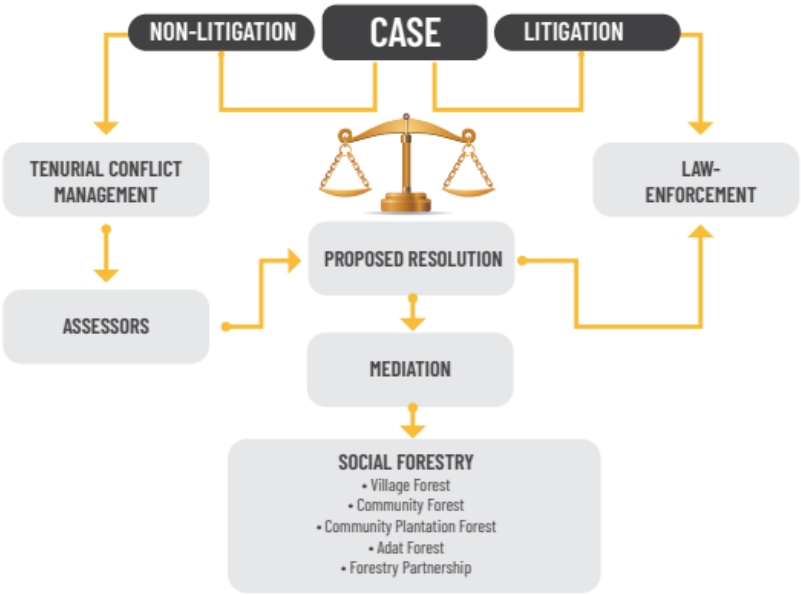


Figure 6 Forest Land Tenure Conflict Management Flowchart

The Land Forest Tenurial Conflict Management is regulated by Minister of Environment and Forestry Regulation No. P.84/MENLHK-SETJEN/2015. Of the number of complaints related to land tenure in the Forest Area and *Adat* forests referred to the Ministry of Environment and Forestry in the period from January 2015 to May 2020, 62 cases have been completed, 243 cases are ongoing, 179 cases have been returned to the complainants or transferred to other authorized units because of a lack of documentation or because cases could not be resolved through the award of Social Forestry permits. Conflicts can be resolved through litigation. But a resolution process is also available which employs assessors, mediators, paralegals, and extension workers.

3.2.4. Government Budget Allocation for Forest and Forestry Sector

The budget expenditure for forest and forestry sector in Indonesia relatively smaller than the other sectors such as infrastructure, national defense, police, social, health and education sectors.

The government's budget allocation for environmental and forestry management activities in Indonesia in 2022 can be described on budget per Echelon, budget based on the kind expense, and budget based on the source of the funds as described below:

a. Ministry of Environment and Forestry Budget (per Echelon 1)

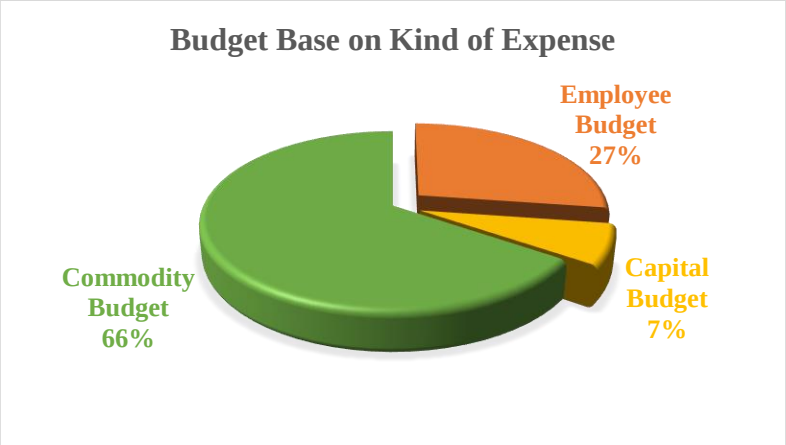
No.	Echelon	Budget	
		IDR	USD
1	PHLHK (Envorcment of Environmental & Forestry Law)	325,340,000,000	21,927,613.40
2	BP2SDM (Human Resource Development & Counseling)	285,850,000,000	19,266,024.13
3	ITJEN (Inspectorate General)	71,370,000,000	4,810,271.62
4	SETJEN (General Secretariat)	480,450,000,000	32,381,883.13
5	PSKL (Social Forestry & Environmental Partnership)	325,160,000,000	21,915,481.57
6	PPI (Climate Change Control)	287,270,000,000	19,361,730.81
7	PKTL (Forestry Planning & Environmental management)	450,400,000,000	30,356,541.08
8	KSDAE (Conservation of Natural Resources & Ecosystems)	1,836,800,000,000	123,798,611.58
9	PHL (Sustainable Forest Management)	344,720,000,000	23,233,807.37
10	BSI (Standardization of Environment & Forestry Instrument)	316,710,000,000	21,345,959.43
11	PSLB3 (Waste, Waste & B3 Management)	263,920,000,000	17,787,962.53
12	PPKL (Pollution & Environmental Damage Control)	253,280,000,000	17,070,836.42
13	PDASRH (Watersheed Control & Protected Forest)	1,754,830,000,000	118,273,909.82
14	BRGM (Agency for Peat land and Mangrove Restoration)	378,600,000,000	25,517,287.86
	Total	**7,374,700,000,000**	**497,047,920.74**

Source: MoEF, August 2022

Table 4 Ministry of Environment and Forestry budget per echelon 1

Budget Kind	Budget	
	IDR	**USD**
Employee Budget	2,011,870,000,000	135,598,166.75
Capital Budget	535,540,000,000	36,094,897.89
Commodity Budget	4,827,290,000,000	325,354,856.10
Total	**7,374,700,000,000**	**497,047,921**

Table 5 Ministry of Environment and Forestry Budget Base on Kind of Expense



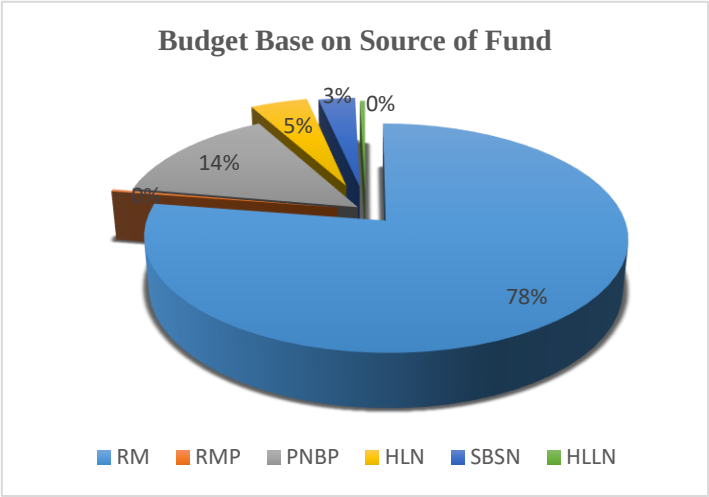
Source: MoEF, August 2022

Figure 7 MoEF Budget Based on Kind of Expense

b. Budget Base on Source of Fund

Budget Source	Budget	
	IDR	USD
RM (Pure state revenue budget)	5,713,090,000,000	385,056,952
RMP (Pure state revenue budget for Companion)	23,260,000,000	1,567,702
PNBP (Non taxe state revenue budget)	1,050,000,000,000	70,769,023
HLN (International Grant)	340,260,000,000	22,933,208
SBSN (Special Activies Budget)	217,560,000,000	14,663,342
HLLN (Direct International Grant)	30,530,000,000	2,057,694
Total	**7,374,700,000,000**	**497,047,921**

Table 6 Ministry of EnvironmeprogramsForestry Budget Based on Source of Fund



Source: MoEF, August 2022

Figure 8 Ministry of Environment and Forestry Budget Based on Source of Fund

3.2.5. Key National Forest Policies and Programs

The Ministry of Environment and Forestry has 8 key national program on forestry[24], namely:

1) Indonesian Legal Wood[25]
   Indonesian Legal Wood is a program to support the certainty of the wood source and prevent illegal logging and deforestation. This program is supported by Timber Legality Information System (TLIS, or SILK Sistem Informasi Legalitas Kayu) under the Sub-dit of Information for Timber Legality Verification,the Directorate of Forest Product Processing and Marketing Development, MOEF. This organization that will function as a licensing information unit as well as a timber legality verification information center. The SILK V-Legal Document online is connected to INATRADE (Indonesian Trading from Ministry of Trade), INSW (Indonesian National Single Window from Ministry of Finance) and can be connected with the respective authority in the export destination country to open direct communication regarding the V-Legal documents clarification.
2) Forest Management Unit (FMU or KPH, Kesatuan Pengelola Hutan)[26]
   Forest Management Unit is a site-level organization in managing state forest areas. This program established based in the Permenhut P.6/Menhut-II/2008 on Establishment of KPH area and Permenhut P.6/Menhut-II/2010 on Norms, Standards, Procedures and Criteria (NSPK) for Forest Management in Protected KPHs (KPHL) and Production KPHs (KPHP).
3) Land and Forest Fire Control (DALKARHUTLA)[27]
   The Ministry of Environment and Forestry established Manggala Agni (Fire Task Force) and SiPongi (Fire Monitoring System). This program is under Sub-Directorate Land and Forest Fire Control, Directorate General of Climate Change Control (Direktorat Jenderal Pengendalian Perubaan Iklim, DITJEN PPI). The Sipongi website displays real time data regarding the distribution of hotspots, fire area, weekly hotspots, monthly per year metrics, and CO2 emissions. It also includes a provincial hotspot map, map filters and daily reports. There is a hotline for reporting incidents of forest and land fires which will be linked to Manggala Agni.
4) Company Performance Rating Program in Environmental Management (PROPER)[28]
   PROPER is developed with several basic principles, namely that PROPER participants are selective, namely for industries that have an important impact on the environment and care about their image or reputation. Information about company performance is communicated using color to facilitate the absorption of information by the public. The business and / or activity performance rating given consists of Gold, Green, Blue, Red, Black.

[24] https://www.menlhk.go.id/
[25] http://silk.dephut.go.id/
[26] http://kph.menlhk.go.id/
[27] http://sipongi.menlhk.go.id/
[28] http://proper.menlhk.go.id/

5) National Level of Environmental Awards (KALPATARU)[29]
   Kalpataru Award is a national environmental and forestry award given by the government to members or community groups who are deemed to have been instrumental in pioneering, serving, saving and fostering environmental and forestry protection and management. the name of the recipient of the Kalpataru award was announced during the environmental day commemoration ceremony.
6) Social Forestry Program (*Perhutanan Sosial*)[30]
   The program opens opportunities for forest communities to apply for forest area management rights to the government, for further processing and if it is approved, then the community has the right to manage (process and benefit) from the forest in a sustainable manner. The Ministry of Environment and Forestry continues to expand community management access to forests through social forestry programs by preparing indicative maps for social forests covering an area of 13,625,710 hectares[31], which means an increase of 0.925 million hectares compared to the stipulated area of 12.7 million hectares in the previous 2015-2019 period.
7) Forest Investment Program[32]
   One of the strategic climate-related funding programs under the Climate Investment Funds (CIF) is the Forest Investment Program (FIP). This program is intended to support the readiness of developing countries in implementing REDD +, by providing financing to improve infrastructure and institutional readiness in order to help adapt to the impacts of climate change on forests, improve sustainable forest management or Sustainable Forest Management (SFM) which reduces emissions and protection of carbon storage.
8) Knowledge Management Information System (KMIS)[33]
   KMIS for FMU is a development system supported by Information and Communication technology related to the acceleration of FMU operations to explore and organize knowledge in support of effectiveness and efficient institutions. KMIS activities include collecting, analyzing, visualizing, storing, and sharing / exchanging data, information, and knowledge, as well as developing useful knowledge products related to forest management in activities in the FMU.

While for 2020-2024 Indonesia has a strategic plan on environmental and Forestry, which can be grouped into 4 issues namely:

1) Environmental issues are related to the quality of the environment and the sustainability of its function ecosystems in sustainable development, consisting of: (1) water resistance, (2) waste and hazardous waste management, (3) environmental damage, (4) air quality, and (5) biodiversity;

[29] http://pskl.menlhk.go.id/
[30] http://sinav.perhutanan-sosial.id/
[31] according to the Minister of Environment and Forestry Decree Number: SK.6394 / MENLHK_PKTL / REN / PLA.0 / 7/2019 concerning Indicative Maps and Social Forestry Area Revision IV
[32] http://www.menlhk.go.id/fip2/beranda
[33] https://kmisfip2.menlhk.go.id/

2) Economic issues related to the contribution of forest resources and the environment to the national economy, consisting of: (1) increasing NTFPs, (2) services environment, and (3) circular Economy;
3) Social issues related to community welfare based on forest resources and the environment consisting of: (1) social forestry, (2) TORA, (3) health community, and (4) environmental education;
4) Governance and institutional issues related to strengthening resource governance forest resources and the environment consist of: (1) consolidating forest areas, (2) effectiveness of governance, (3) mainstreaming of climate change, (4) law enforcement and a culture of compliance with LHK laws and regulations, and (5) enabling conditions.

3.2.6. Forest Sector's Alignment to National Imperatives

The government of Indonesia has the National Medium-Term Development Plan (RPJMN) for 2020 to 2024 aims to achieve a prosperous, equitable, and sustainable Indonesia that reaches middle-high income status. The four mainstreaming being sought are: The Sustainable Development Goals (SDGs) including 17 Goals and 118 Targets; Gender; the development of Social and Cultural Capital; and Digital Transformation. These four areas of mainstreaming underlie sectoral and regional development, and implicitly take into account environmental sustainability and inclusive implementation.

The President's five directives for RPJMN 2020-2024 are human resource development, infrastructure development, regulations simplification, bureaucracy simplification, and economic transformation. These directives are then translated into a seven-part Development Agenda/National Program (*Program Nasional, PN*). The Ministry of Environment and Forestry directly contributes to PN 1 Strengthening economic resilience for quality and equitable growth, PN 2 Developing regions to reduce inequality and ensure equal distribution, PN 3 Improving the quality and competitiveness of human resources, and PN 6 Environmental development and enhancing resilience toward disaster and climate change. Under these are assigned to eight Priority Programs (PP), as follows: Increasing quantity/availability of water to support economic growth, increasing value-added, employment, and investment in the real sector, and industrialization, Developing regions to reduce inequality and ensure equal distribution, Alleviating poverty, Increasing productivity and competitiveness, Improving the quality of the environment, Increasing disaster and climate resilience, and Low carbon development.

3.2.7. International Engagement & commitment to International/Regional Goals

- The first Nationally Determined Contribution of Indonesia to Paris Climate Agreement was submitted on 6 November 2016.
- Indonesian Biodiversity Strategy and Action Plan (last update 24 October 2017).

- Updated from the Indonesian Biodiversity Strategy and Action Plan (IBSAP) (2003-2020), the IBSAP (2015-2020) responds to the provisions of decision X/2 of the CBD COP on Strategic Plan for Biodiversity 2011-2020 and national priorities related biodiversity management for achieving sustainable development goals. The current IBSAP comprises the principal guidelines to be taken into account by policy-makers in the biodiversity sector, and is also intended to serve as a key reference document for implementing programs and activities in other development sectors, be they government, private, or civil-society sectors, at either national or sub-national level. The IBSAP also calls for the need to ensure consistency with actions carried out to implement other international treaties to which Indonesia is a Party.
- Indonesia's Voluntary National Contributions in support of the United Nations Strategic Plan for Forests 2017-2030.
- As part of a global effort, the Indonesian Government is committed to do its part under the Paris Agreement and shows progress in the implementation of its Nationally Determined Contribution (NDC), including aspects of both mitigation and adaptation. The Ministry is in the process of reviewing and updating Indonesia's NDC. Currently, Indonesia's 2030 NDC targets for reducing emissions are 29 percent through its own efforts, and up to 41 percent depending upon levels of international cooperation.
- Indonesia also complies with the Katowice Package as part of its UNFCCC commitments. The package sets out the essential procedures and mechanisms that will operationalize the 2015 Paris Climate Agreement.
- The Rio Declaration for Environment and Development at the 1992 Earth Summit determined that Sustainable Consumption and Production (SCP) would be Goal 12 of the Sustainable Development Goals (SDGs). In 2013 the Ministry of Environment and Forestry, together with other ministries and the Indonesian Chamber of Commerce and Industry, published the 10-Year Framework of the National SCP Program. In 2020, the Ministry of Environment and Forestry and the Ministry of National Development Planning updated and incorporated Indonesia's 10-year SCP into the Framework for Indonesia's SCP for 2020 to 2030. SCP themes include climate change, resource efficiency, water, and food.
- Environmental Outlook and Science for Decision-Making: The Indonesian Government communicates forestry programs and achievements, including through the first State of Indonesia's Forests (SoIFO) document launched at the FAO Committee on Forestry forum in 2018 and 2020, submitted the 6th National Report to the Secretariat of the Convention for Bio Diversity (CBD) in 2019 to report Indonesia's achievement toward the Aichi Biodiversity Targets, and organized the 7th Indonesia-EU Joint Implementation SVLK Committee in 2019.
- International Tropical Peatland Center. Indonesia is one of the leading countries in tropical peatlands management and research, and the founding country of the International Tropical Peatlands Center (ITPC), which includes the Democratic Republic of Congo, the Republic of Congo and Peru. Other parties supporting the work of ITPC

include the Center for International Forestry Research (CIFOR), the U.N. Environment Programme (UNEP) and the U.N. Food and Agriculture Organization (FAO). The ITPC was launched in Jakarta on 30 October 2018.

- World Mangrove Center Initiative. Indonesia is aiming to establish a World Mangroves Center (WMC) to serve and share Indonesia‘s experiences in mangrove rehabilitation and conservation actions and collaborate with global stakeholders to save the world‘s mangroves. The WMC will also serve as an International Hub to provide access to mangrove ecosystem research. The WMC will connect, coordinate, and foster collaboration between different stakeholders at all levels and in many sectors across many nations.
- The Convention on Biological Diversity. Indonesia ratified the Convention on Biological Diversity (CBD) in 1994. At the national level, the convention is implemented through the Indonesian Biodiversity Strategy and Action Plan (IBSAP), which is valid for the period from 2015 to 2020. The IBSAP for 2015-2020 was formulated by updating parts of the IBSAP for 2003-2020 document, which had in turn updated the 1993 Biodiversity Action Plan (BAPI). Indonesia has also ratified a number of agreements related to the CBD Convention, including the Cartagena Protocol on Biosafety and the Nagoya Protocol.
- The Convention on International Trade Endangered Species of Wild Fauna and Flora (CITES). Indonesia became a member of CITES in 1975, and ratified the Convention in 1978, with implementation commencing in 1979. Indonesia currently plays a strategic role as a member of the Standing Committee, the Animals Committee and as an alternate member of the Plants Committee as a representative from the Asia region. Indonesia also serves on CITES Tree Species Advisory Committee. The Ministry of Environment and Forestry is the national focal point for management authority, while the Indonesian Institute of Sciences (LIPI) is the national focal point for scientific authority.
- The Ramsar Convention. Indonesia ratified the Ramsar Convention in 1991,100 with implementation commencing in 1992. Signatories to the Ramsar Convention are obliged to register at least one wetland site of international significance as waterfowl habitat. To date, seven Indonesian wetland sites have been designated as Ramsar sites, these being in Berbak National Park (1992), Danau Sentarum National Park (1994), Wasur National Park (2006), Rawa Aopa Watumohai National Park (2011), Sembilang National Park (2011), Pulau Rambut Wildlife Sanctuary (2011) and Tanjung Puting National Park (2013). The total area covered by these seven sites is 1,372,976 hectares.
- The UNESCO Mand and Biosphere Program (MAB). Indonesia had already committed itself to the Man and Biosphere Programme (MAB), conceived by UNESCO in 1968 and launched in 1971. Indonesia formed the Indonesian National Committee for the MAB Programme in 1972. By mid2020, the number of conservation areas in Indonesia designated as biosphere reserve areas had reached 22.
- ASEAN Heritage Parks. As a member of the ASEAN, the Republic of Indonesia participates in the ASEAN Heritage Parks program, which is a regional cooperation

program for ASEAN Member States committed to effectively managing selected and representative conservation areas within the jurisdiction of member countries, which then become the legacy of ASEAN. At present, Indonesia has 7 conservation areas that have the status of ASEAN Heritage Parks.

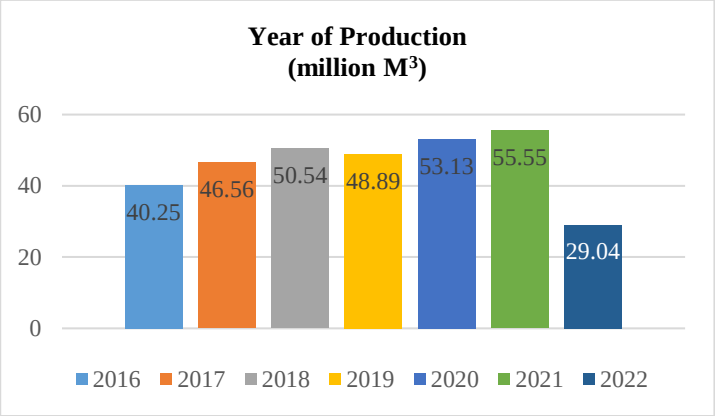
3.3. Forestry and Forest Products

3.3.1. Forest Sector Production

In the forestry sector, there are three (3) types of forest products, namely: timber, processed wood, and non-timber forest products. The following data corresponds to One Data (July 2022) The Directorate General of Sustainable Forest Management, Ministry of Environment and Forestry.

a. Timber.

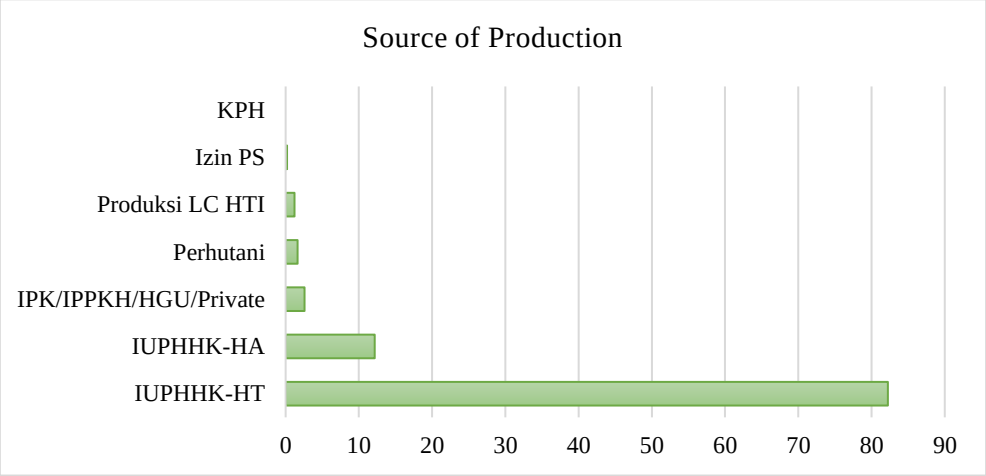
a.1. Timber Based on Year of Production



Source: Satu Data Ditjen PHL (July 2022)

Figure 9 Timber Production Based on Year of Production

a.2. Timber Based on Source of Production



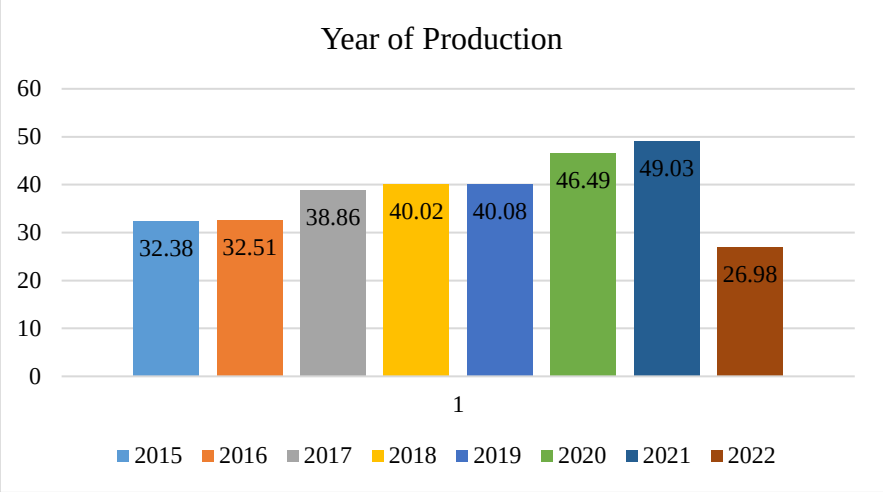
Note: IUPHHK-HT: Timber Forest Product Management Business License-Plantation Forest; IUPHHK-HA: Timber Forest Product Management Business License-Plantation Forest-Nature Forest; IPK/IPPKH/HGU/Private: Lease Area; Perhutani: Forest State Company; Produksi LC HTI: Land Clearing Plantation Forest; Izin PS: Social Forestry License; KPH: Forest Management Unit.

Source: Satu Data Ditjen PHL (July 2022)

Figure 10 Timber Based on Source of Production

b. Processed Wood

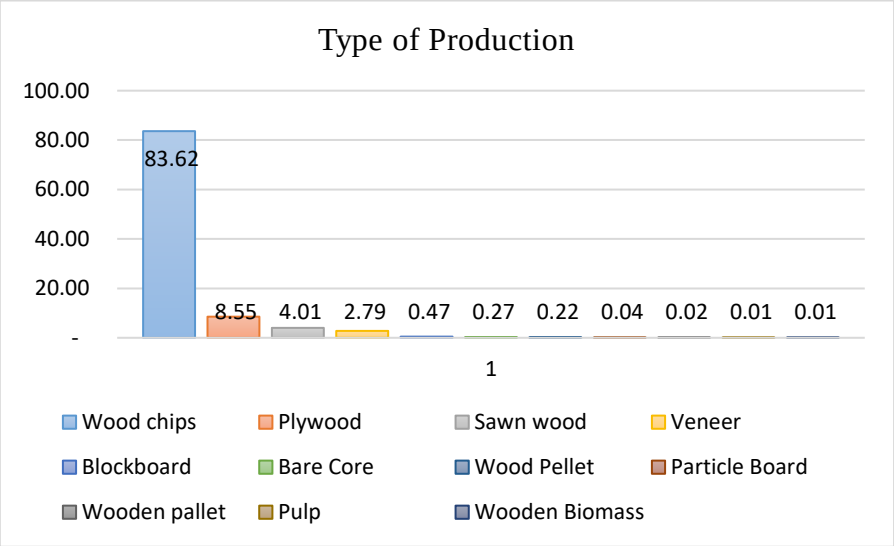
b.1. Processed Wood Based on Year of Production



Source: Satu Data Ditjen PHL (July 2022)

Figure 11 Processed Wood Based on Year of Production

b.2. Processed Wood Based on Type of Product

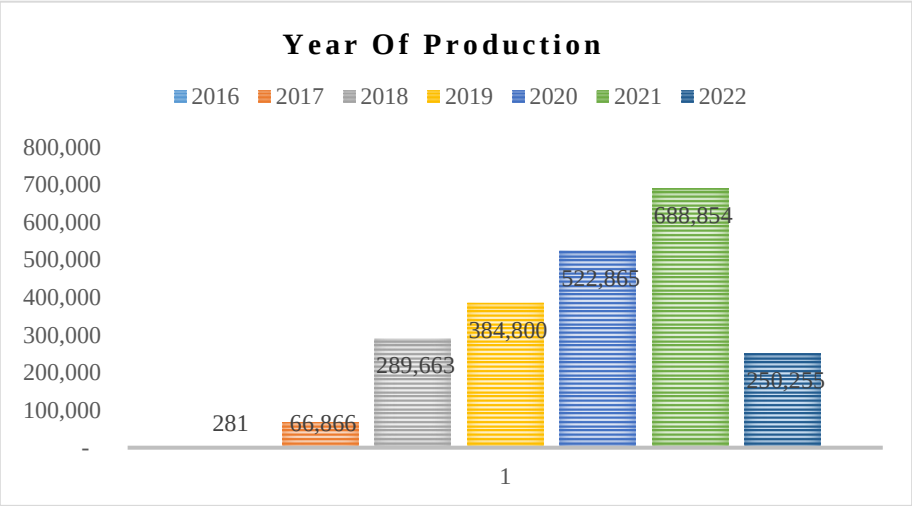


Source: Satu Data Ditjen PHL (July 2022)

Figure 12 Processed Wood Based on Type of Product

c. Non-Timber Forest Product

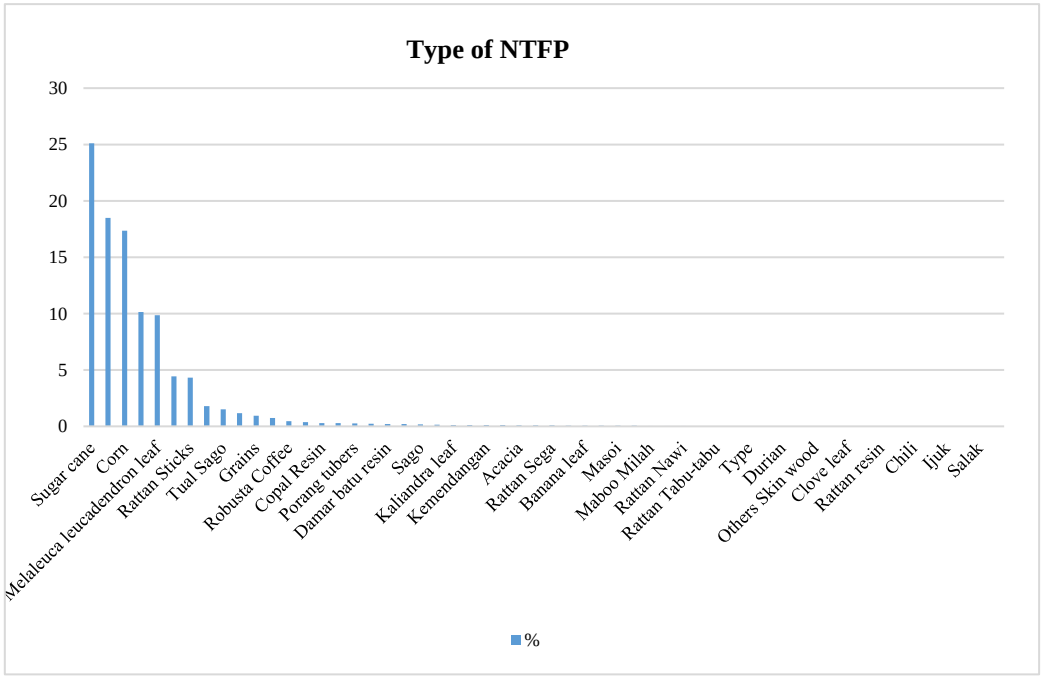
c.1. Non-Timber Forest Product Based on Year of Production



Source: Satu Data Ditjen PHL (July 2022)

Figure 13 Non-Timber Forest Product Based on Year of Production

c.2. Non-Timber Forest Product Based on Type

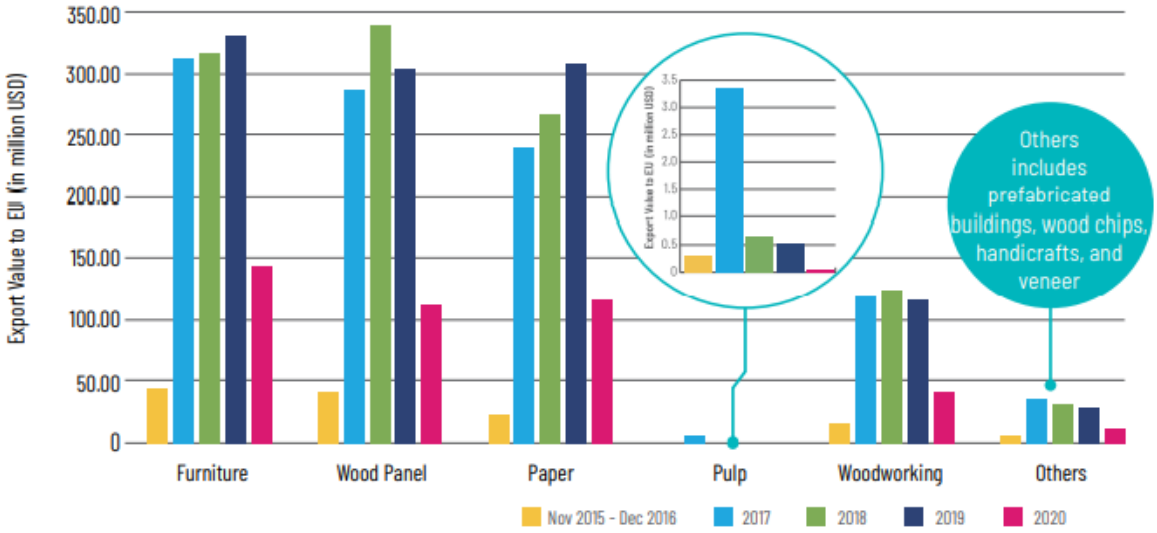


Source: Satu Data Ditjen PHL (July 2022)

Figure 14 Non-Timber Forest Product Based on Type

3.3.2. Forest Sector Trade

Indonesia is one of the world's largest exporters of tropical timber products. It exports a wide variety of timber products, ranging from plywood, wood panel, paper, pulp, woodworking, furniture, and other. The product that is most exported is plywood, followed by sawnwood, industrial roundwood and, in less proportion, veneer. the top 3 export destinations of Indonesia in the last year were China, United States, and Japan. Indonesia also export to EU. The export to EU accounted for 9% of Indonesia's total export value and 5% of export quantity. Within the EU, the top 3 countries that import timber from Indonesia are the UK, Germany and the Netherlands.

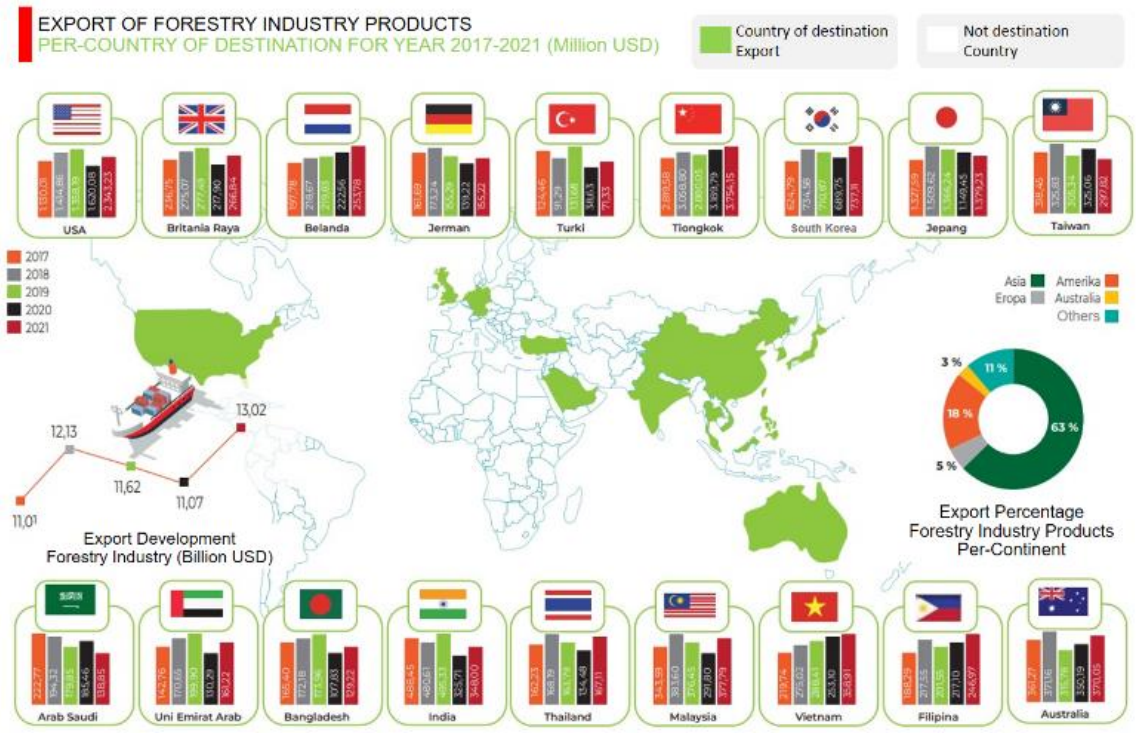


Source: KLHK, Data as May 2020 in SOIFO 2021[34]

Figure 15 Value of Indonesian Processed Timber Exports to European Union (2016-2020)

2016 Indonesia began issuing FLEGT licenses. This guarantee that all timber exported from Indonesia is legal makes the country unique in the timber sector The backbone of the FLEGT-VPA process is the Timber Legality Assurance System (*SVLK*), which is a mandatory system applicable for implementation to every timber-related business in Indonesia. The *SVLK* ensures the timber industry uses legal raw materials and is required for export to all countries, not only the EU. According to data from https://silk.menlhk.go.id/, in the period from 15 November 2016 to 31 December 2019, 123,025 FLEGT licensed and document V-Legal shipments were received by importers in 28 countries in the European Union, with a total associated export value of USD 3.29 billion. Meanwhile, from January to May 2020 the export value to EU reached USD 425.87 million.

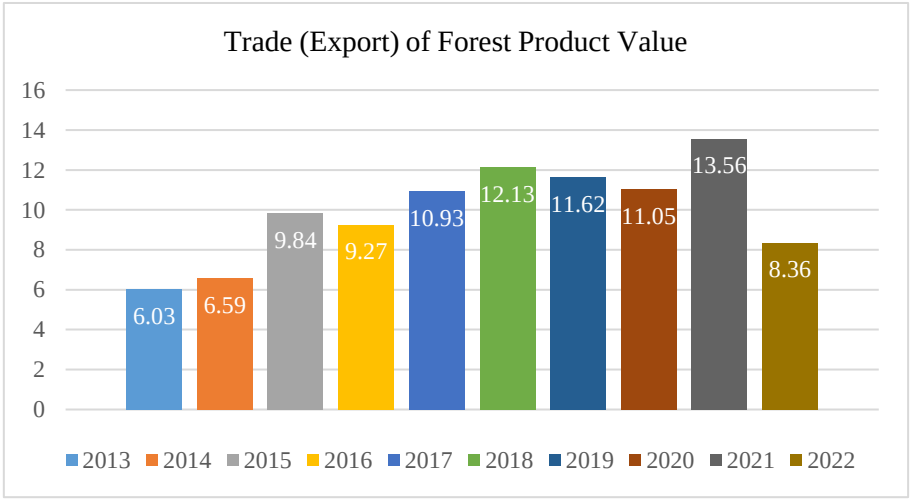
[34] Ministry of Environment and Forestry, Republic of Indonesia. 2020. The State of Indonesia's Forest 2020. Ministry of Environment and Forestry, Republic of Indonesia: Jakarta.



Source: *Satu Data Ditjen PHL (July 2022)*
Figure 16 Eksport to Various Continent (2017-2021)

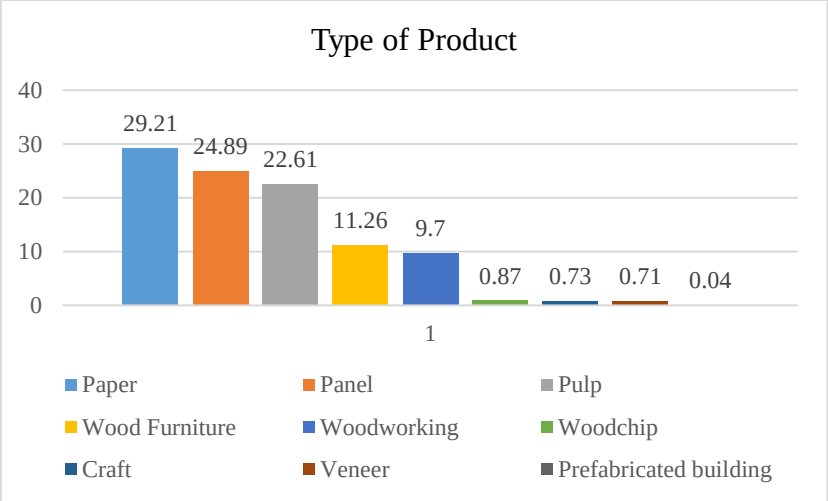
Here is the update data for forest product in Indonesia consisting of data on the export value, forest product types, and eksport destination country from 2013 to 2022 (July).

a. Export Value of Forest Products



Source: Satu Data Ditjen PHL (July 2022)
Figure 17 Trade (Export) of Forest Product Valuse Based on Year Production

b. Export of Forest Products Based on Product Type

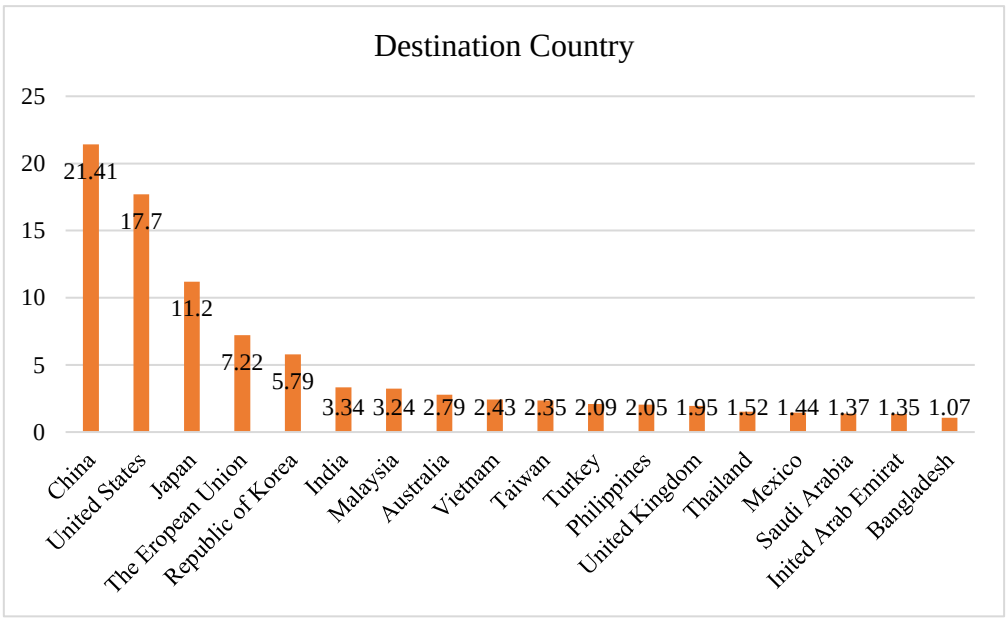


Source: Satu Data Ditjen PHL (July 2022)

Figure 18 Export of Forest Products Based on Product Type

c. Eksport Destination Country

Based on data on forest product export, China is the largest export destination country for forest products from Indonesia, followed by the United States, Japan, the European Union, the Republic of Korea, and other countries with percentages below 1 percent.



Source: Satu Data Ditjen PHL (July 2022)

Figure 19 Export of Forest Product Based on Country Destination

3.3.3. Forest Sector Employment

3.3.3.1. General Worker

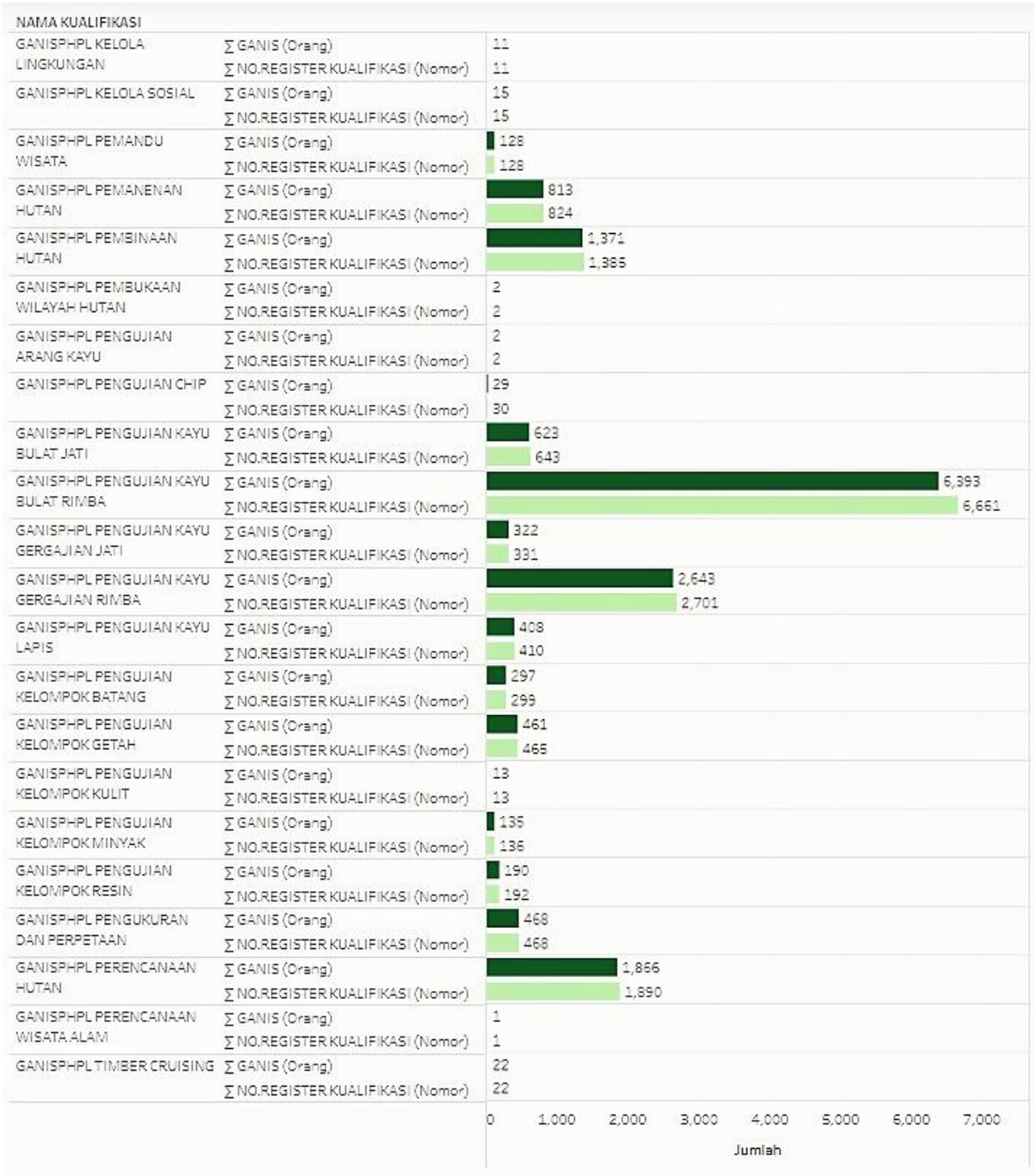
The data about forest sector employment can be referred to the National Labour Force Survey (*Sakernas, Survey Angkatan Kerja Nasional*) and the Indonesian Standard Industrial Classification (*KLUI, Klasifikasi Baku Lapangan Usaha Indonesia*), both published by the Indonesian Statistic Center Berau (BPS, Badan Pusat Statistik Indonesia[35]). These data show that the agriculture, forestry, and fishing sector provides about 29,76% of all jobs in Indonesia. Although this is a relatively low contribution, the forestry sector, especially sustainable forestry and commercial plantation forestry, are sectors of growing importance in Indonesia.

The forestry sector in Indonesia, as expected, has a large number of workers, the great majority of which are assisted by unpaid workers who are likely to be family members. The members of this group are likely to consist of poor farmers who work in social forestry share farming with government entities. Based on BPS, 2021 that the range of salaries of most workers in the Forestry Labor profession from IDR 2,072,079.05 to IDR 4,870,592.95 per month in 2021. Laborers in forestry perform routine and simple tasks to maintain and preserve nature and forest plants, and cut trees, cut and saw Indonesian trees.

[35] BPS RI. 2021. Statistical Year book of Indonesia 2021. Badan Pusat Statistik: Jakarta.

3.3.3.2. Government Employee

Indonesia has technical personnel for sustainable production forest management (GANISPHPL) with a total of 13,029 people consisting of 11,898 men and 1,131 women. Meanwhile, the number of management units that use GANIS is 3,693 units. One technical personnel can have several qualification register numbers and can work in several management unit places.



Source: Satu Data Ditjen PHL-KLHK, July 2022

Figure 20 technical personnel of PHPL

3.4. Forest and Climate Change

3.4.1. Roles of Forest Sector in National Climate Change Policy (NDC, etc.)

One of the countries that contribute to high greenhouse gas emissions is Indonesia. Regarding the impacts of climate change, geographically Indonesia is an archipelagic country that is very vulnerable to the impacts of climate change. Indonesia will not be able to overcome the problem of climate change which has become a global environmental issue without cooperation with other countries. So with these conditions, Indonesia's active involvement in international forums to encourage cooperation under the United Nations Framework Convention on Climate Change (UNFCCC) and other forums related to climate change issues. The climate is something that has to be done. Nationally Determined Contribution (NDC) is an effort that must be made by each country to reduce emissions and adapt to climate change in accordance with the Paris agreement at COP 21 UNFCCC.

In November 2016 Indonesia's NDC was submitted to the UNFCCC. The NDC document submitted is the result of coordination and collaboration with relevant ministries and institutions in the implementation of climate change, and there are five sectors that are targets for reducing greenhouse gas emissions by 2030, namely: the forestry sector, energy, waste, industrial processes and product use (Industrial). Processes and Product Use), and agriculture.

The aim of Indonesia's climate change adaptation is to reduce climate change risks in all development sectors (agriculture, water, energy security, forestry, marine and fisheries, health, public services, infrastructure, and urban systems) by 2030 through capacity building, improved management knowledge, policies focused on climate change adaptation and disaster risk reduction, and the application of adaptive technology. The NDC aims to communicate Indonesia's commitment to addressing climate change issues. NDCs are reported and verified in the Biennial Transparency Report, BTR.

Indonesia's commitment to the NDC is to reduce 29% of greenhouse gas emissions through the efforts of the Indonesian government (unconditional), and 41% with international assistance (conditional) and seek to reduce the risk of climate change by 2030. This reduction is expected to occur in the period from 2020 to 2030 as measured using the 'business as usual' (BAU) baseline in 2010. It is expected that the most significant portion of emission reductions from the forestry sector is 17.2 percent (from 29 percent unconditional), and 23 percent (from 41 percent conditional). The energy sector ranks second after the forestry sector, which is 11 percent for unconditional and 14 percent for conditional. Reducing emissions in the waste, IPPU and agricultural sectors are other sectors that are targeted by the Indonesian government through mitigation and adaptation measures that are tailored to the characteristics of each sector. For example, steps for the forestry sector are starting from handling forest and land fires, waste management, campaigning for environmentally friendly transportation modes, and in the agricultural sector, namely low-emission water management.

Indonesia's deforestation rate from 2013–2020 BAU scenario follows the REDD+ Forest Reference Emission Level (FREL) baseline, that is, 920,000 hectares per year of

planned and unplanned deforestation. To reduce the rate of deforestation below the BAU level, Indonesia must limit its average deforestation rate to 450,000 hectares per year in 2013-2020. As shown in Figure 4, the planned and unplanned deforestation during the period 2013-2018, is close to the average deforestation rate. However, in the following two years, the deforestation rate exceeded the predetermined average. Thus, the average rate of deforestation in the six-year period reached 580,000 hectares per year. For BAU in 2021-2030, the average planned and unplanned deforestation rate is estimated to be 0.820 million hectares per year. Indonesia targets to reduce its average deforestation rate to 325,000 hectares per year over the next decade.[36]

The following is data on national greenhouse gas emission figures for 2020:

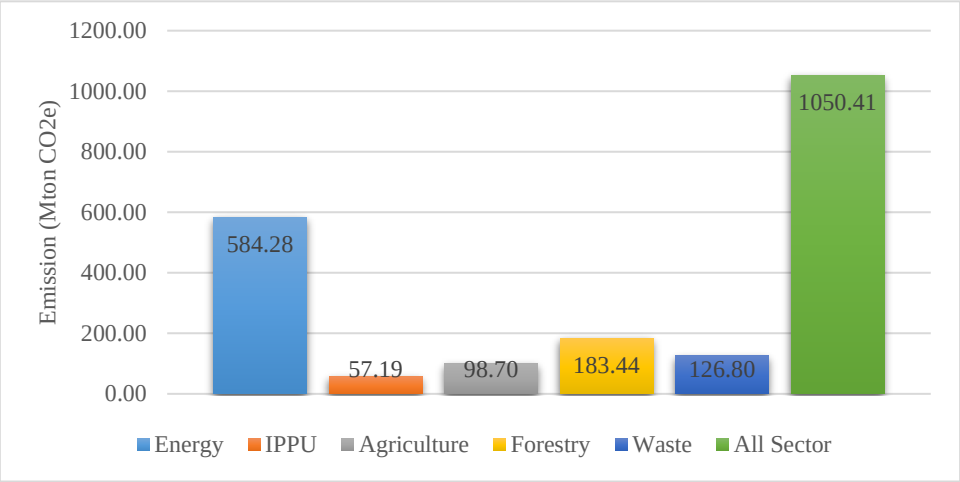


Figure 21 National Green House Emission in 2019 for Each Sector (IGRK Report, MoEF 2021).

The overall greenhouse gas emission profile for the period 2000-2020 is depicted in the following graph:

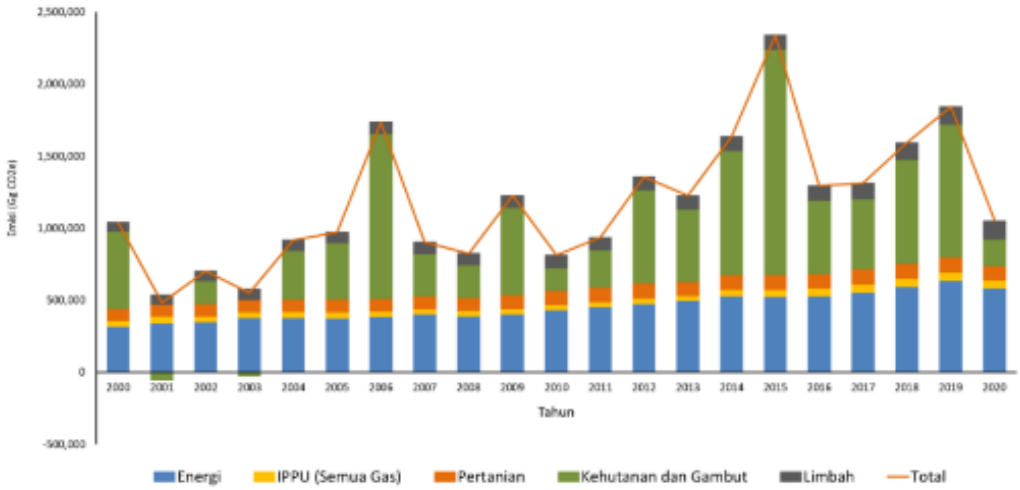
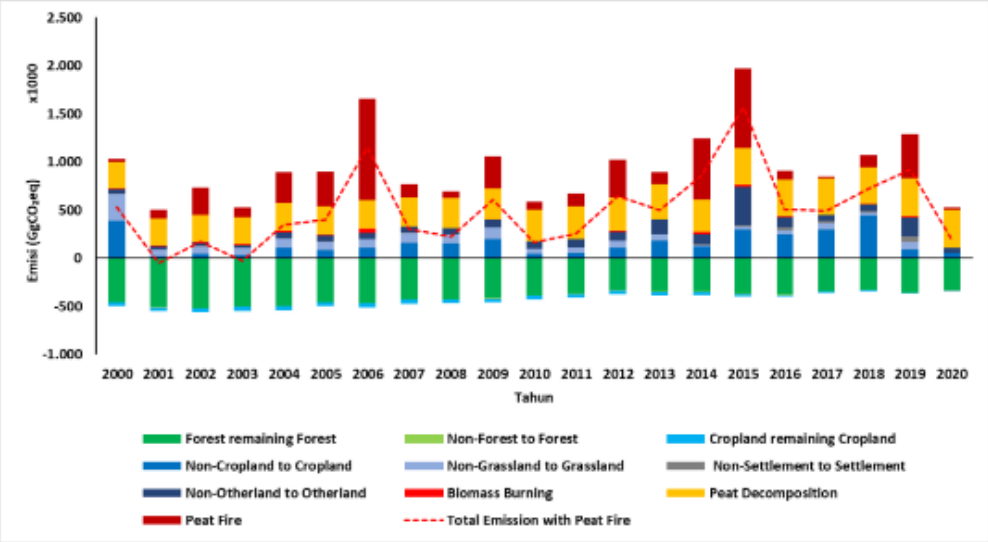


Figure 22 Figure. Profil of National Green House Emission in 2000-2019 (IGRK Report, MoEF 2020)

[36] Status Hutan dan Kehutanan Indonesia 2020

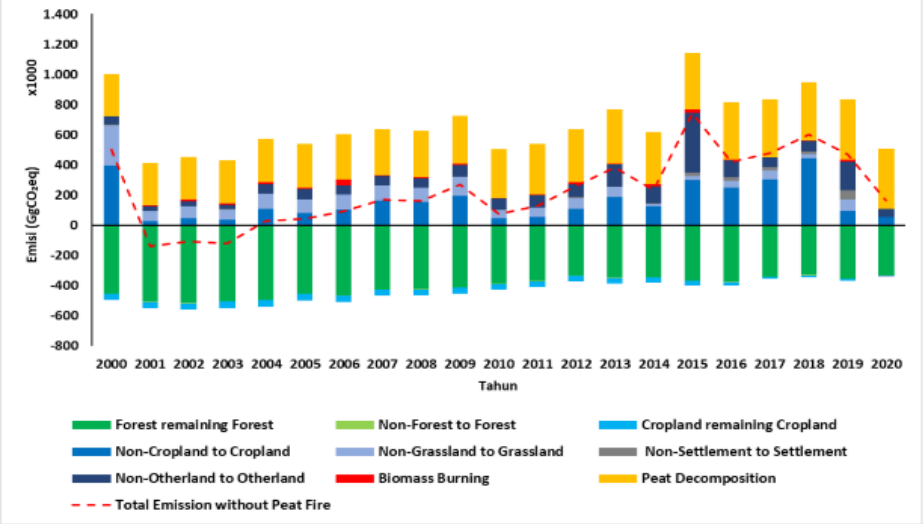
Forestry Sector Emissions and Other Land Use from 2000-2019 are summarized using the 2006 IPCC Guideline format as presented in the following figure with peat fire data and non-peat fire data.

The total greenhouse gas emissions from the inventory and calculations in the forestry sector and other land uses in 2019 was 924,853 Gg CO2e, 27.83% higher than 2018. The following figure is a graph of the trend of emissions in the forestry sector and other land uses with peat fie and without peat fire. From the two graph trends below, it can be seen that greenhouse gases from the forestry sector and other land uses are highly volatile. And peat fire has a big influence in determining the trend of greenhouse gas emissions.



Source: IGRK Report, MoEF 2021

Figure 23 Emissions From The Forestry And Other Land Use Sector, Year 2000-2020 (With Peat Fire)

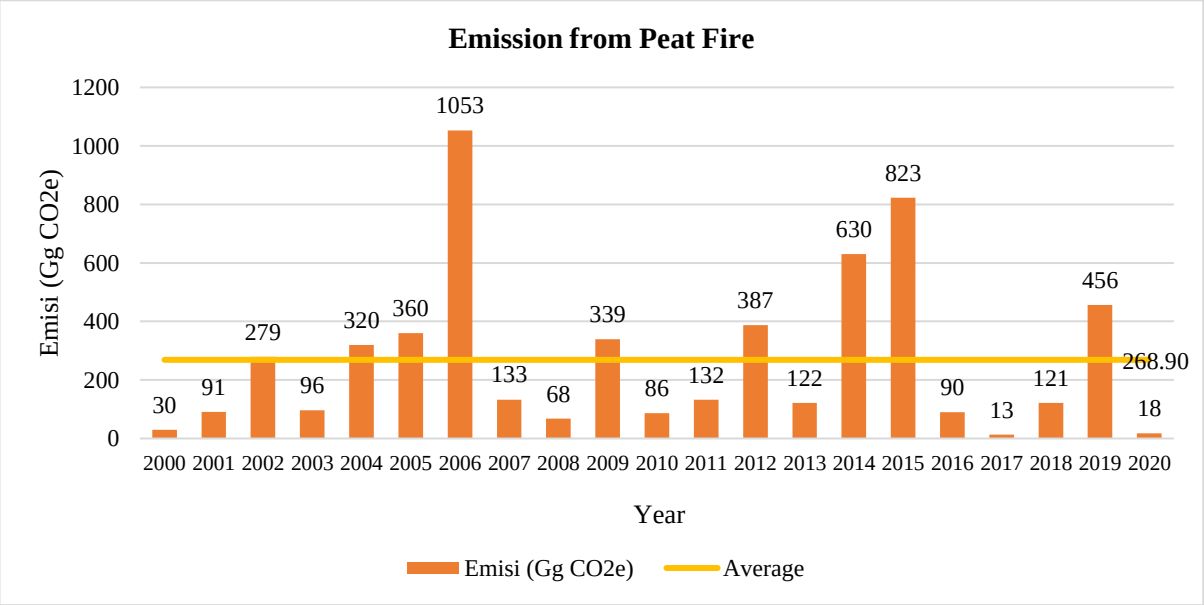


Source: IGRK Report, MoEF 2020

Figure 24 Emissions From The Forestry And Other Land Use Sector, Year 2000-2019 (Without Peat Fire)

The average GHG emission during the period 2000-2020 is 499,329 Gg CO_2e /year. There was an extreme increase in emissions in 2006, 2009, 2014, 2015 and 2019 in those years the El Nino phenomenon occurred. El Nino is a phenomenon of warming sea surface temperatures in the central to the eastern Pacific Ocean. In Indonesia, in general, there is a dry climate and reduced rainfall, causing peatlands to become dry and highly flammable. And the El Nino phenomenon is one of the causes of peat fires with a long enough intensity and covering a large area.[37]

The following figure is a graph showing emissions from peat fires that occurred in 2020 of 18.460 Gg CO_2e. This figure shows a decrease from 2019 which was 456.427 Gg CO_2e. This is directly proportional to the decrease in the area of peat burned, from 494,450 Ha in 2019, to 19,998 Ha in 2020.

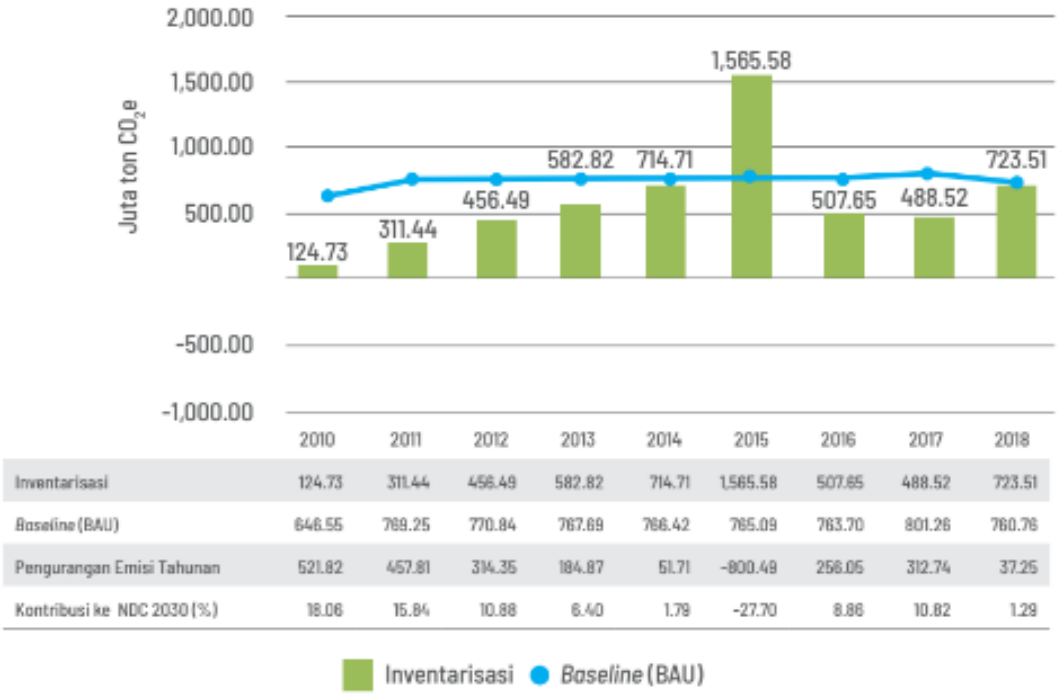


Source: IGRK Report, MoEF 2021

Figure 25 Emissions from Peat Fire 2000-2020

According to the NDC, forestry sector has an unconditional target (CM1) in reducing GHG emissions by 17.2% or 497 Million tonnes of CO2e compared to the BAU scenario in 2030 and in in 2020 the forestry sector has a target CM1 emission level of 447.07 million tons CO2e or 41.48% compared to BAU 2020. it can be seen the achievement of reducing GHG emissions in the forestry sector in 2020 based on a comparison between the actual emissions from the forestry sector GHG inventory with baseline NDC (BAU) emissions in the forestry sector amounting to 580.62 million tons CO2e or 75.99%. Thus, the achievement of reducing GHG emissions in the forestry sector and other uses are above the CM1 2020 target.

[37] Laporan IGRK, MoEF 2020



	2010	2011	2012	2013	2014	2015	2016	2017	2018
Inventarisasi	124.73	311.44	456.49	582.82	714.71	1,565.58	507.65	488.52	723.51
Baseline (BAU)	646.55	769.25	770.84	767.69	766.42	765.09	763.70	801.26	760.76
Pengurangan Emisi Tahunan	521.82	457.81	314.35	184.87	51.71	-800.49	256.05	312.74	37.25
Kontribusi ke NDC 2030 (%)	18.06	15.84	10.88	6.40	1.79	-27.70	8.86	10.82	1.29

Source: KLHK, 2020d

Figure 26 Comparison of forestry sector GHG Inventory Results with Forestry Sector Emission BAU in 2010-2018

3.4.2. Climate Change Adaptation and Disaster Risk Reduction in Forest Sector

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

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

Indonesia's 'Updated NDC' elaborates on adaptation even more, as sets a vision for a long term strategy of climate resilient development. Key programs, strategies, and actions

for each area of resilience have been identified. In general, the key programs, strategies, and actions on adaptation aim at: a) reducing drivers of vulnerability to climate change, b) responding to climate change impacts and managing risks, c) enhancing capacity of communities and sustainability of ecosystem services, d) enhancing engagement of stakeholders at all levels in building climate resilience.

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

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

3.4.3. Global Partnership for Forest Protection

REDD+ is a policy that provides national scale positive incentives to achieve forest and land use GHG emissions reductions with a phased approach. REDD+ in Indonesia is a national program built on sub national implementation in three phases – readiness, transition, and full implementation with result-based payments. Measures to reduce emissions resulting from deforestation and forest degradation are subsumed under the REDD+ program, which holds the promise for particularly significant mitigation measures in the forestry sector. The REDD+ program promotes policy approaches and incentive mechanisms to: reduce the level of emissions as well as risk of climate change from deforestation and the degradation of forests; intensify the role of conservation of carbon stocks; increase sustainable forest management; increase carbon stocks. A national MRV system for REDD+, supported by the National Forest Monitoring System (NFMS), has been developed and undertaken to support climate change adaptation and mitigation, and is committed to presenting this information in a way that is transparent and understandable.

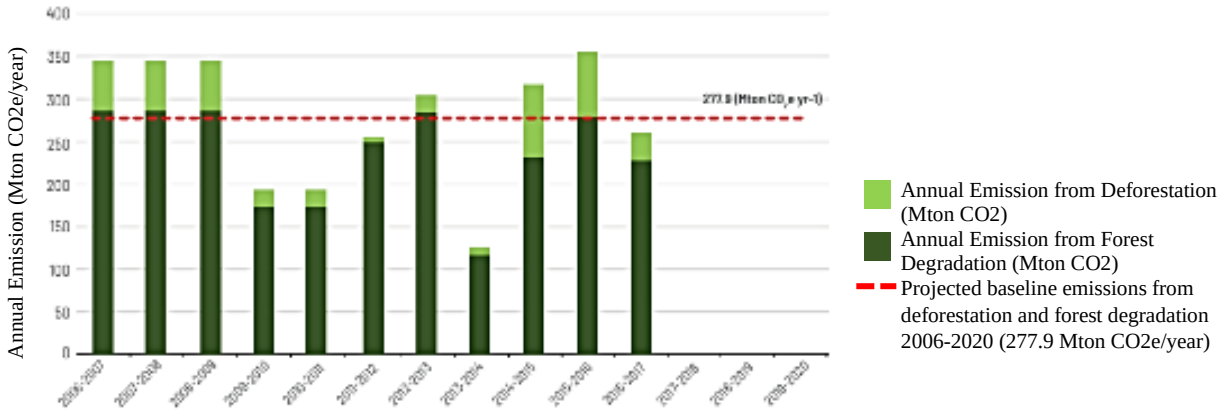


Figure 27 Annual Emissions from Deforestation and Forest Degradation

Indonesia underwent a Technical Assessment process for the 1st FREL document for 10 months in 2016 and passed with the issuance of a Report on the Technical Assessment of the Proposed FREL of Indonesia by the UNFCCC Secretariat. Thus, the FREL document officially becomes the reference level for emissions for the forestry sector, and marks the start of the full implementation phase of REDD+ in Indonesia. Indonesia cut its emissions by 48,978,427 tCO2e annually (average of annual emissions reductions) and 244,892,135 tCO2e cumulatively, as a result of reductions in deforestation and forest degradation between 2013 and 2017, calculated against the 1990 to 2012 baseline emissions in the 1st FREL document. The results achieved by Indonesia from reducing emissions from deforestation and forest degradation for REDD+ in 2013 to 2017 were submitted to the UNFCCC Secretariat in the technical annex to the 2nd Biennial Update Report (BUR) of Indonesia and underwent Technical Analysis by the UNFCCC Secretariat in 2019.

The second FREL uses reference periods with ranges of 10-15 years. Increases its scope to include: (1) deforestation, (2) forest degradation, (3) peat decomposition of areas subject to deforestation and forest degradation, (4) peat fire, (5) mangrove soil carbon, and (6) enhancement of carbon stock. In addition, there are addition of carbon pools: Above Ground Biomass (AGB), Below Ground Biomass (BGB), dead wood, soil organic matter (peat and mangrove). This has improved activity data and emission factors and has an improved uncertainty assessment. If accepted by the UNFCCC, the 2nd National FREL will have a validity period for the years 2021 - 2030.

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

For REDD+ Funding Instruments, the Indonesian Government has established the Environmental Fund Management Agency (Badan Pengelola Dana Lingkungan Hidup, BPDLH). BPDLH is a public service agency (Badan Layanan Umum, BLU) that is accountable to and structurally operationalized under the Minister of Finance of the Republic of Indonesia. Pursuant to Act No. 32 of 2009 on Environmental Protection, the government has issued Government Regulation No. 46/ 2017 on Economic Instruments for the Environment. This regulation states that an environmental degradation/ pollutant fund and conservation grant fund will be managed by central government using a BLU. This regulation, in turn, is now serving as the basis for the establishment of the Environmental Fund Management Agency (BPDLH). Presidential Regulation No. 77 of 2018 on Environmental Fund Management was subsequently issued, and the organization of BPDLH has been further regulated through Ministry of Finance Regulation No. 137 of 2019. The BPDLH was launched on October 9, 2019 by the Minister of Finance, the Minister of Environment and Forestry and the Coordinating Minister for Economic Affairs.

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

a. REDD+ Funds within the framework of cooperation between Indonesia and Norway: As stated in the Indonesia Norway Cooperation Letter of Intent, Norway will provide payments to reduced emissions through REDD+ activities of up to USD 800 million. The payments will be made between 2020 and 2030. At present Indonesia has completed an assessment of the 2016 to 2017 emission reduction results and it is expected that payment will be made by Norway in the near future.
b. Green Climate Fund (GCF) REDD+ Result Based Payment Project: Indonesia has received approval from GCF for its request for resultbased payments for reducing emissions through REDD+ activities between 2014 to 2016. Funds received by Indonesia from this request are expected to be USD 103 million. These funds will be used by Indonesia from 2020 to 2023.
c. Forest Carbon Partnership Facilities (FCPF Carbon Fund): The Indonesian Government participates in the FCPF's Carbon Fund program in collaboration with the World Bank. Results-based payment are intended for REDD+ pilot activities in East Kalimantan Province which will be carried out from 2020 to 2024. The potential funding that can be received is USD 110 million.
d. Bio Carbon Fund Initiative for Sustainable Forest Landscapes (BioCF ISFL): Similar to activities in the Province of East Kalimantan, the Indonesian government is also aiming to access BioCF ISFL funding for REDD+ pilot activities in Jambi province. There, REDD+ result-based payment will be made in amounts up to USD 70 million, if emissions can be shown to have been reduced over the period of 2021 to 2030.

3.5. Human Resources and Institutional Capacities in Forest Sector

3.5.1. National Forest Administrative Capacity

Based on the Regulation of the Minister of Environment and Forestry of the Republic of Indonesia Number P.18 / MENLHK-II / 2015 concerning the Organization and Work Procedure of the Ministry of Environment and Forestry, the Bureau of Personnel and Organization has the task of carrying out guidance and management of personnel administration and institutions within the Ministry Environment and Forestry of the Republic of Indonesia Number P.18 / MENLHK-II / 2015 concerning the Organization and Work Procedure of the Ministry of Environment and Forestry, the Bureau of Personnel and Organization has the task of carrying out guidance and management of personnel administration and institutions within the ministry. The total employes in Ministry of Environment and Forestry based on Data SIMPEG per 2nd of August 2022 is 15,200 government officer plus non-government officer.

Echelon I in MOEF	Number of employees
Secretariat General	845
Inspectorat General	197
Directorate General of Forestry Planning and Environmental Mangement	1.315
Directorate General of Natural Resources and Ecosystem Conservation	6.196
Directorate General of Watershed and Protection Forest Management	1.524
Directorate General of Sustainable Production Forest Management	816
Directorate General of Pollution and Environmental Damage Control	273
Directorate General of Waste Management and Hazardous Toxic Materials	265
Directorate General of Climate Change Control	476
Directorate General of Social Forestry and Environmental Partnerships	337
Directorate General of Environmental and Forestry Law Enforcement	1.178
Agency for Human Resources Development & Counseling	829
Agency for Standardization and Instrument of Environment and Forestry	949
Total	**15.200**

Source: Data SIMPEG per 2nd August 2022 [38]

Table 7 The Number of Employees of the Ministry of Environment and Forestry

3.5.2. Research and Development

Research and Development on forestry before 2020 were conducted by Forest and Environment Research, Development, and Innovation Agency (FOERDIA). But based on Presidential Regulation No. 50 of 2020 about the Ministry of Research and Technology (Kementerian Riset dan Teknologi) all activities related to research, development, and assessment and application (LITBANGJIRAP) which before under the ministries will be integrated to one body namely the National Research and Innovation Agency (BRIN, Badan Riset dan Inovasi Nasional).

[38] http://simpeg.menlhk.go.id/

Based on Presidential Regulation No. 92 of 2020 about the Ministry of Environment and Forestry, that FOERDIA is not mentioned as a part of MOEF.

FOERDIA has already produced 250 innovations in the form of products, methods, processes, tools, and ideas/concepts. There are Intellectual property rights in the form of 29 patents, 11 process patents, 57 copyrights, and 4 PVTs. In addition, there are many inventions such as:

1) Environmental Services Technology, such as Result Base Payment-Forest Partnership, Edu-ecotourism, Forest Carbon Calculation, Micro Hydro Technology;
2) Watershed/Peatland Rehabilitation Technology, such as Superior clones, mutation breeding, Water Balance, reclamation, restoration, microbes, mycorrhizae, briquette bio pot growing media, micopeat;
3) NTFP & Timber Technology, such as Superior clones of eucalyptus oil, food from forest, medicine, wood identification (AIKO technology), preservation, laminate, bioethanol, herbarium, and xylarium of tropical trees;
4) Technology, such as Smart Green City, Green Industry, Circular Economy City forest, RT water management, waste management, waste, pollution, emission test, mercury test;
5) Biodiversities & habitat conservation technology, such as In-situ and ex-situ, engineering breeding, animal corridors, area management, and sanctuary.

FOERDIA had 27 professors of a total of 987 researchers. There are 38 Forest areas with Particular Purposes for Research (KHDTK, Kawasan Hutan dengan Tujuan Khusus) with an area of 33,949 hectares, a Forest Library with 14,000 collections, 8 laboratories including 5 arboretums, Xylarium with 203,809 collections, 3,400 forest microbes' collection, and 8,000 herbarium collections. Under FOERDIA also establish International Tropical Peatland Center (ITPC) as the center for learning tropical peatland as well as Center of Environment Standardization (Pustanling, Pusat Standar Lingkungan). The research and development activities are conducted with partnership with ASOF, ASOEN, ASEAN, ACIAR, CIFOR, ICRAF, IUFRO, IRP-UNEP, UNFF, AFoCO, Komatsu, ITTO, FAO, World Bank, USAID, APFNet.

3.5.3. Forest Education and Training

The education and training related to forestry are conducted by the Extension and Human Resource Development Agency (BP2SDM, Badan Penyuluhan dan Pengembangan Sumber Daya Manusia). The Agency has 8 center of education and training related to forestry throughout Indonesia, 5 vocational high school of forestry, extension office in Regency area throughout Indonesia, training for echelon I, and e-learning education and training due to Covid-19 situation. The agency has 177 widyaiswara/ lecturers on forestry and 2,817 government extension officers.

Follow up on the direction of the Minister of Environment and Forestry in the context of implementation physical distancing policy related to the COVID 19 Pandemic, on March 2020 was the momentum for BP2SDM to take steps changes in systems, methods and work patterns as well as orientation to community while still implementing the intermediate health

protocol others develop E-learning through LHK Learning Management System. here are 5 type of e-learning/training, namely leadership training; administration training; functional training; technique training; and community training. There are 10 class programs provided online in cooperated with the other directorate generals under the MOEF, namely Social Forestry Program; Watershed and Protected Forest Management Program; Climate Change Control Program; Forestry and Environmental Planning Program; Sustainable Production Forest Management Program; Pollution and Environmental Damage Control Program; Natural Resources and Ecosystem Conservation Program; LHK Law Enforcement Program; Waste Management Program; Management Support Programs and More. The activities from preparation, teaching and learning activities, e-certificate, evaluation, and report are conducted online.

4. Challenges and Opportunities

4.1. Challenge

In the forestry sector, Indonesia still has challenges in the future. It is called a challenge because Indonesia must be able to continue to carry out development by protecting forests and the environment to avoid damage. The current challenges include:

- That land is needed to support the food estate development program in supporting the provision of food for the welfare of the community, which from time to time continues to increase in population.
- Indonesia has an obligation together with other countries to play a role in climate change issues, especially in reducing greenhouse gas emissions.
- Deforestation is still possible in the future because non-forestry activities in the form of borrowing to use areas are still ongoing, such as mining, oil palm planting, and other non-forestry activities.

Starting in the beginning of 2020, the early phase of President Jokowi's second term, the COVID-19 pandemic hit all aspects of life in this country, including the forestry sector. It has impeded efforts, and threatened to undermine much of what has been achieved in the last couple of years, especially because the national budget allocation for the forestry sector and the environment has been hugely reduced to cope with the escalating pandemic. Nevertheless, the government is still confident that by prioritizing activities and maintaining consistency with corrective measures, Indonesia can continue to progress towards sustainable forest management within a long-term vision of sustainable development.

Indonesia has continuously improved forest governance through: (1) emphasizing President Jokowi's vision on ensuring the provision of a healthy environment for all citizens, which include sustainable forests; (2) permanently ceasing the issuance of new licenses in all primary forests and most peatlands; (3) enhancing the restoration of forest landscapes, social forestry, forest fire control, as well as improving the effectiveness of conservation management; (4) increasing the participation of the business community in land rehabilitation, such as the planting of 109,000 hectares of trees by the business community (a condition attached to 'lease use' permits), together with 100,000 to 200,000 hectares of trees planted annually by the state (depending upon budget available); (5) state rehabilitation of 637,000 hectares of critical mangrove forests through 2024, out of a nationwide total of 3.3 million hectares of mangrove forests; (6) encouraging habitat development, biodiversity conservation and wildlife corridors connecting their fragmented habitats; (7) maintaining conservation areas that have been recognized by World Heritage, Ramsar, and others; and (8) upscaling best practices developed in through applied research, forest education, and community forests. Since 2018 the Ministry of Environment and Forestry has evaluated oil palm concessions and their licenses, and come up with 1.34 million hectares of forested areas within concessions that will be maintained as high conservation value forests.

Indonesia's scientific approach is strengthened by national experts and the international community, both in the form of technical co-operation as well as intellectual

contributions. Based on the 1992 Rio de Janeiro-Brazil Earth Summit, the concept of sustainable development has been mainstreamed into the country's long-term management plan and is being implemented with the support of practical tools and technologies.

From Strategic Plan of Ministry of Forestry and Environment for 2020-2024, There are some problems relating to the quality of the environment that have not reached a good category and the preservation of ecosystem functions has not been maximized in sustainable development.

a. Problems relating to the decline in the percentage of forest and environmental resources contribution to the national economy.
b. The problem is that the target of access to management and distribution of forest benefits has not been achieved for the welfare of the community.
c. The problems are related to the inadequate strengthening of governance and institutions in the environmental and forestry sector.

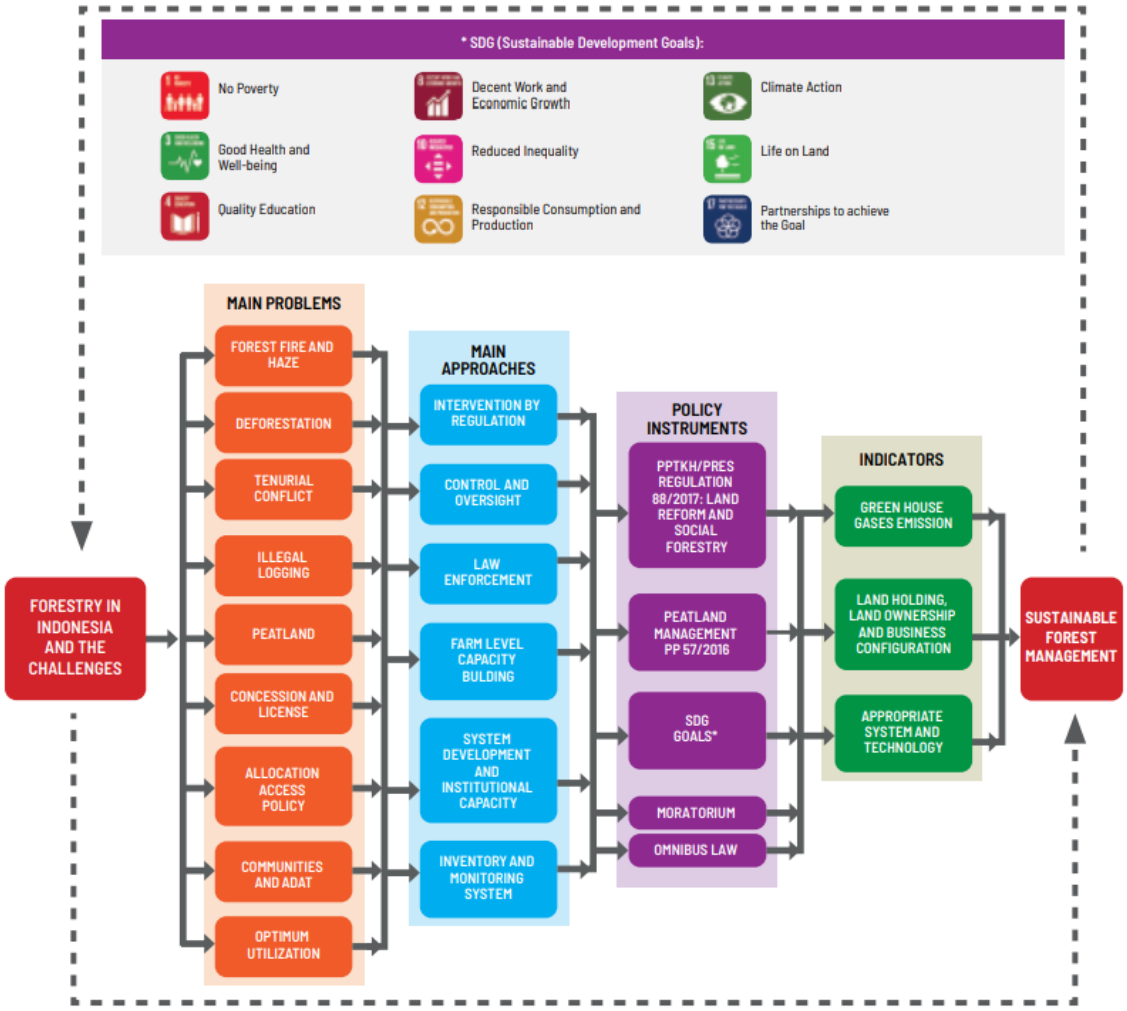


Figure 28 Forest Governance in Indonesia: New Paradigm, New Concept, New Policies.

4.1.1. Forest Protection and Restoration

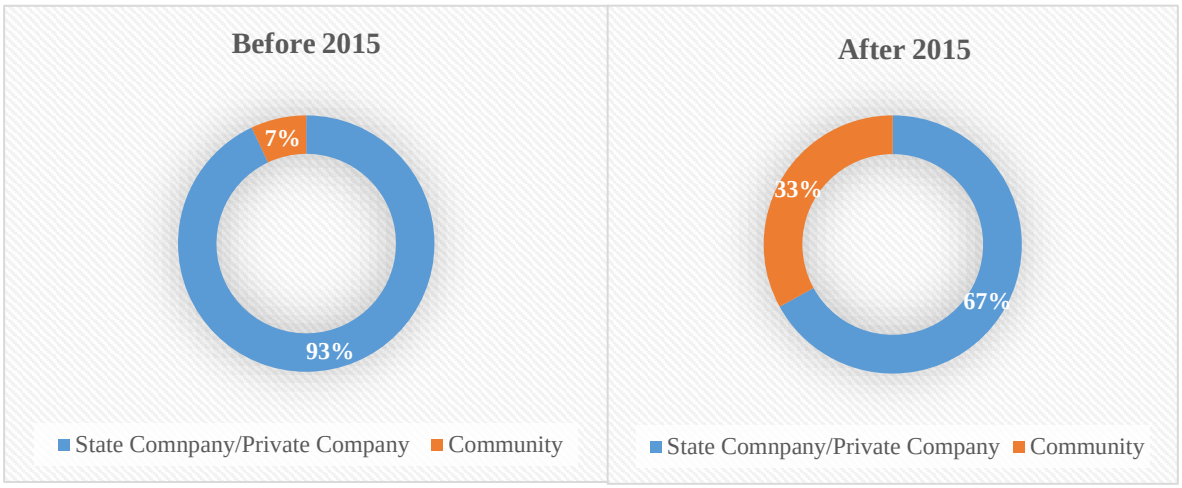
Forest protection efforts are to suppress and prevent deforestation and forest degradation. The causes of deforestation and forest degradation are the conversion of land from forest areas to settlements, the provision of planting areas for food sources, illegal logging, mining, forest and land fires, and others. Therefore, the effort made by Indonesia is to prevent the occurrence of the causes mentioned above. The followings are the effort carried out:

a. Moratorium on Utilization of Primary Natural Forests and Peatlands

The Indonesian government has taken an important policy, namely a moratorium on the use of primary natural forests and peatlands. The legal basis for the policy is in the form of Presidential Instruction No. 10 of 2011 concerning Postponing the Granting of New Permits and Improving Governance of Primary Natural Forests and Peatlands, which are valid for two years. The mandate of the presidential instruction is to temporarily stop granting new permits to primary natural forests and peatlands, which are located in Conservation Forest Areas, Protection Forests, Production Forests, and Other Use Areas (APL). The Presidential Instruction was extended up to three (3) times until finally the issuance of a new presidential instruction number 5 of 2019 which at the same time changed the policy of delay (moratorium) to the termination. The Ministry of Environment and Forestry is following up on the Presidential Instruction policy through the Decree of the Minister of Environment and Forestry which stipulates "Indicative Map of Suspension of Granting New Permits for Forest Utilization, Use of Forest Areas, and Changes in Designation of Forest Areas and Other Use Areas", then shortened to PIPPIB and known as " Moratorium Map".

b. Land Provision for Community and Non Forestry Sector

Population growth and economic growth is a necessity that causes an increase in the need for land. One way to fulfill the need for such land is to change the status of the forest area into settlements or agricultural and plantation land. Government policies prior to 2015 were used more by government-owned enterprises and the private sector than by the community. Meanwhile, starting in 2015 the government took a policy by giving more roles to the community in managing forests. This policy contains 3 important elements, namely land, human resource development, and business opportunities for the community. These conditions can be seen in the following figure:



Source: KLHK 2018a dalam Status
Figure 29 Land Provision for Community

This policy is stated by the government in the TORA (Land Object of Agrarian Program) program. The objectives of the TORA program are to reduce inequality in land tenure and ownership; improve the welfare of rural communities; create jobs in order to reduce poverty levels; increasing public access to economic resources; support the improvement of food security and sovereignty; maintain and improve the quality of the environment; and to facilitate the resolution of agrarian conflicts.

c. Law Enforcement Related to Forest Crimes.

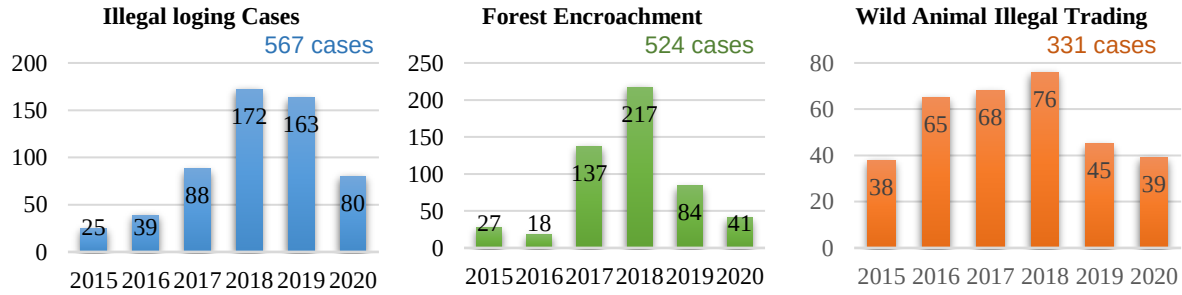
Forestry crimes often occur in the field. Forestry crimes can occur directly in the field and can also occur in cyberspace. Forestry crime prevention activities are carried out by Forestry Officers/Police under the Directorate General of Law Enforcement at the Ministry of Environment and Forestry together with the Regional Government, the Indonesian National Armed Forces, and the Indonesian National Police. Forest crime operations are carried out on three things, namely: forest encroachment, illegal logging and illegal trade in protected wildlife.

Forest encroachment operations are carried out in forest areas in an effort to maintain forest integrity from encroachers, either individuals or companies. Operations are carried out by removing encroachments from within the area and then carrying out follow-up activities in the form of restoration, rehabilitation, and or reforestation in areas damaged by encroachment.

Illegal logging operations are carried out from upstream to downstream, which means that operations are carried out not only in forest areas but also for transportation and also up to the illegal timber processing sites.

Illegal wildlife trade operations are carried out by conducting inspections in animal trade markets and also by checking information technology through websites or online accounts of illegal wildlife trade.

The following is case data in handling forestry crimes:



Source: Status Hutan dan Kehutanan Indonesia 2020

Figure 30 Number of Cases Related to Forestry Crimes

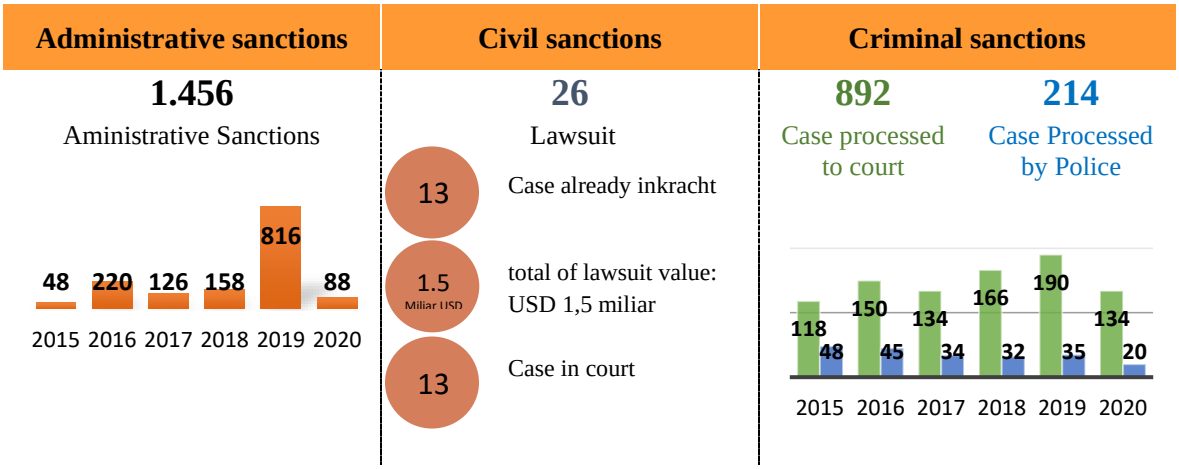
d. Law Enforcement Related to Forest and Land Fires.

In the context of handling forest and land fire prevention and increasing awareness and compliance of people or business entities to be responsible for forest fires in concession areas, the Ministry of Environment and Forestry has taken preventive steps, namely the imposition of administrative sanctions in the form of written warnings, government coercion, revocation of permits, license suspension, up to license revocation. From January 2015 to September 2020, 1,456 administrative sanctions have been issued. 538 administrative sanctions out of 1,456 sanctions are cases of forest and land fires.

No.	Type of Sanction	2015	2016	2017	2018	2019	2020	Total
1	License revocation	3	0	0	0	0	0	3
2	License suspension	16	0	0	0	0	0	16
3	Government coercion	4	18	11	10	35	10	88
4	Letter Warning	0	115	0	0	316	0	431
Total		**23**	**133**	**11**	**10**	**351**	**10**	**538**

Table 8 Type and Amount of Sanctions in Forest and Land Fire Law Enforcement (2015-2020)

Data related to law enforcement is described in detail in the following figure:



Source: KLHK, Status Hutan dan Kehutanan Indonesia, 2021

Figure 31 Types and Process of Sanctions on Law Enforcement for Forestry Crimes

e. Forest Area Restoration.

e.1. Watershed Area Rehabilitation

In order to restore the landscape as before, Indonesia continues to carry out forest and land rehabilitation through rehabilitation programs in watersheds throughout Indonesia. These efforts include rehabilitation of watersheds, priority lake areas, rehabilitation of reservoirs, development of mangrove forests and urban forests. During the period from 2015 to 2021, the following are data on the achievement of forest and land rehabilitation in Restored Watershed.

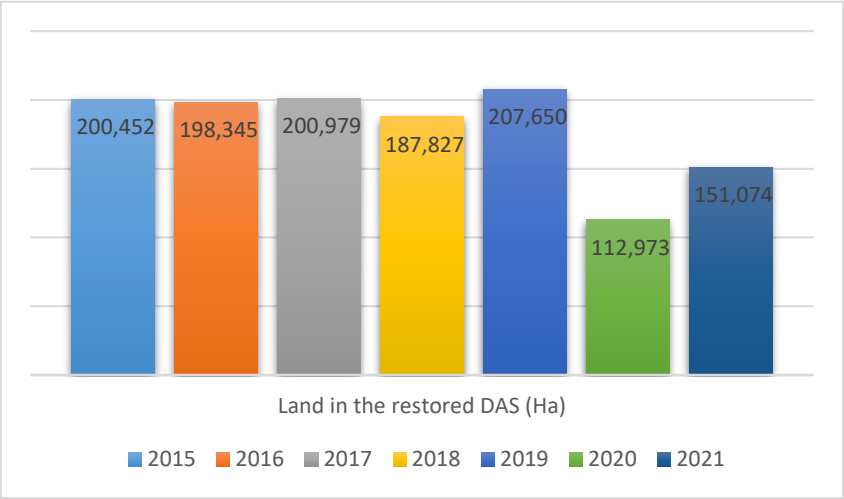


Figure 32 Watershed Area Rehabilitation (Ha) for Period 2015-2021.

e.2. Critical Land Restoration

Landscape restoration activities are also carried out on critical lands with restoration. Critical land is certainly not only located in watershed areas, but can also be located in areas that are difficult to reach, such as areas of former non-forestry activities, namely mining concession areas or forest area borrow-to-use permits (IPPKH).

Year	Management Type of Production Forest area (ha)			
	IUPHHK-HA	IUPHHK-HT	IUPHHK-RE	KPHP
2015	181,052	333,298	974	940
2016	21,339	300,075	2,657	2,344
2017	15,942	206,757	3,477	233
2018	20,865	240,743	24,865	2,424
2019	20,594	330,073	10,378	5,138
2020	3,117	93,149	41,178	-
Total	262,909	1,504,095	83,529	11,079

Source: Status Hutan dan Kehutanan Indonesia (2020)

Table 9 Critical Land Restoration Based on Management Type of Production Forest (2015-2020)

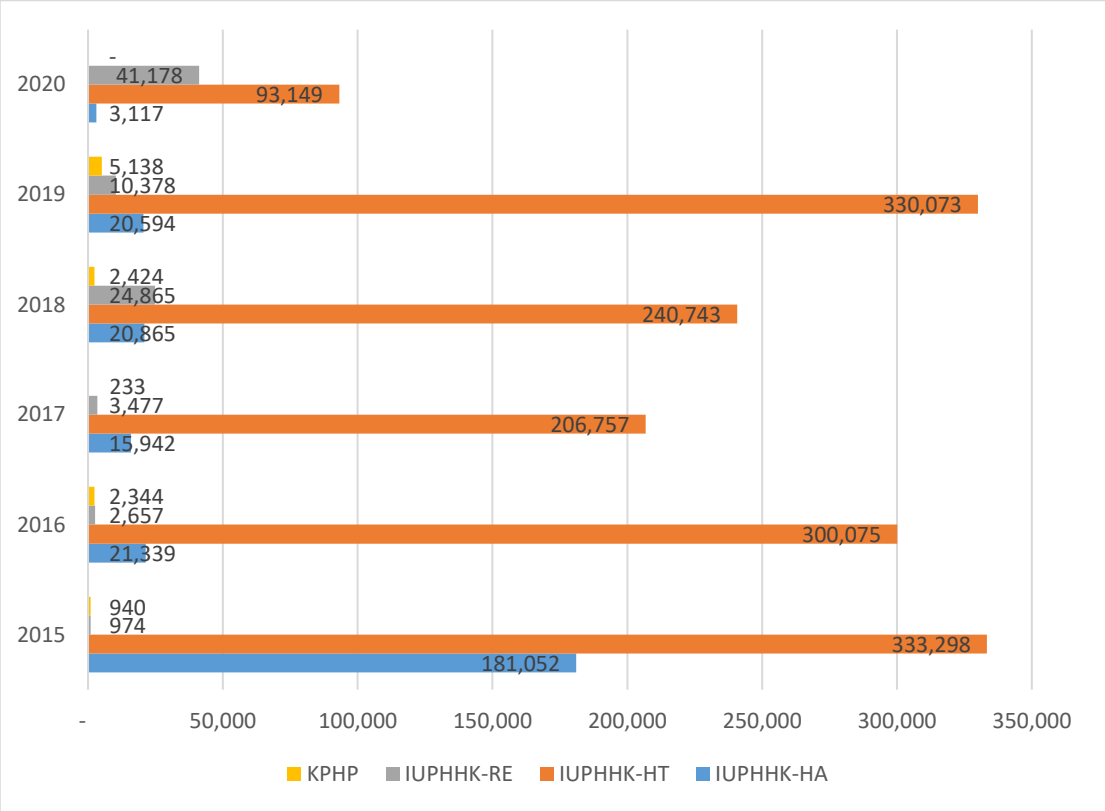


Figure 33 Critical Land Restoration Based on Management Type of Production Forest (2015-2020)

e.3. Restoration of Conservation Forest Area Ecosystem

It has been identified that approximately 2 million hectares of conservation forest areas have been degraded. In accordance with the function of the Conservation Area, it is to protect the life support system, and to preserve the diversity of flora and fauna species and their ecosystems. Restoration of Conservation Forest areas is intended not only to restore stands, but also to restore the entire ecosystem and its functions, including plant and animal populations and other biodiversity, which includes land conservation areas and marine conservation areas. So that ecosystem restoration activities in conservation areas are carried out with three approaches, namely: natural mechanisms, ecosystem rehabilitation and ecosystem restoration.

In the process of ecosystem recovery, there are often obstacles due to several obstacles such as lack of activity budget, lack of equipment and facilities, lack of technical skills of human resources, lack of partners and others. So with these obstacles, a special strategy is needed in restoring ecosystems in conservation areas. Namely by establishing partnerships with stakeholders, especially local communities living in or around conservation areas. Communities who used to be encroachers in or around conservation areas, have now become partners in ecosystem restoration in conservation areas. With this strategy, positive results have been obtained, although the numbers are still relatively small. Of the 554 land

conservation areas and marine conservation areas in Indonesia, there are 13 areas that show success, as shown in the following table:

No.	Concervation Area	Habitat Type	Partner	The extent of the restored ecosystem (Ha)
1	Gunung Leuser National Park	Tropical Rain Forest	UNESCO, OIC	870
2	Bukit Barisan Selatan National Park	Tropical Rain Forest	UNILA-PILI-OWT	200
3	Way Kambas National Park	Tropical Rain Forest	Tropis Alert	1,715
4	CA Pulau Dua (Serang)	Mangrove	Wetlands International	715
5	Gunung Gede Pangrango National Park	Tropical Rain Forest	Mitsubishi Corporation, OISCA Sukabumi TC	18
6	Gunung Ciremai National Park	Tropical Rain Forest	JICA-JICS	7,728
7	SM Paliyan	Karst	Mitsui Sumitomo Insurance Ltd	350
8	Tahura Ngurah Rai	Mangrove	JICA	250
9	Gunung Palung National Park	Tropical Rain Forest	Yayasan Asri	37
10	Betung Kerihun Danau Sentarum National Park	Tropical Rain Forest		36,579
11	Sebangau National Park	Tropical Rain Forest	WWF	688
12	Matalawa National Park	Tropical Rain Forest (Peat land)	JICA-JICS	4,868
13	Taka Bonarate National Park	Coral Reefs		870

Source: Status Hutan dan Kehutanan Indonesia, KHLK 2020.

Table 10 Restoration of Conservation Forest Area Ecosystem

4.1.2. Sustainable Forest Utilization

The challenge in sustainable forest use in Indonesia is a pattern of how to extract products from the forest, either directly or indirectly, while maintaining their sustainability. The pattern implemented is as follows:

1. Implementation of the Program in Production Forest Management Activities
   a. Reduced Impact Logging (RIL)

      Reduce Impact Logging is logging carried out by permit holders trying to use forests to reduce forest damage. Its main activities include logging, skidding using winching, stacking and transporting logs which are carried out effectively and efficiently so that RIL can be used as an indicator of the Sustainable Forest Management System (SPHL). Companies that implement RIL have benefited from:

      - Improved logging efficiency.
      - Decreased standing damage after harvesting.
      - Contribution to local and national emission reduction.

- Market acceptance of wood products has become wider.
- Opportunities for collaboration with non-governmental organizations (NGOs).[39]

b. Forestry Multi-business

The multi-business concept only requires one business license for all company business activities in the forest area. The business period is also slack, up to 90 years and can be extended, including the expanded scope of business covering activities of area utilization, utilization of environmental services, utilization and collection of timber forest products and non-timber forest products, it is hoped that the value of the forest will increase for the welfare of the community.[40]

c. Teknik Silvikultur Instensif (SILIN)

SILIN is a production forest improvement strategy that combines three activities, namely tree breeding, environmental manipulation, and management of Plant Pest Organisms (Organisme Pengganggu Tanaman/OPT).[41]

2. Community involvement in sustainable forest management:

a. Providing access to the community through social forestry.

In Indonesia, there are 25,863 villages whose community lives have close ties to the surrounding forest. Social forestry aims to provide legal access to communities to utilize forest resources. The community-based forest management paradigm guarantees justice, democracy, transparency, anti-corruption, and community welfare. With this, agrarian reform and natural resource management can be implemented in stages. Social forestry and agrarian reform are expected to have a strong relationship so that social forestry can be implemented within the framework of agrarian reform.

b. Recognition of Indigenous forest

Indigenous forest is a social forestry scheme where the forest is in the territory of the Customary Law Community. Indigenous forests must be managed according to their original function. For example, if the forest was previously designated as a Protected Forest, then the Indigenous Peoples are only allowed to use non-timber forest products but are still prohibited from cutting down trees. Likewise, if the area is a Conservation Forest, the activities that can be carried out are only those that are allowed in the Conservation Forest Area. Meanwhile, if the initial function is Production Forest, Indigenous Peoples are allowed to cut trees after submitting a long-term management plan and annual work plan by providing clear information on how much timber will be cut each year.

c. Protected Forest Management through Community Participation

The Forest Management Unit (KPH) is the smallest unit responsible at the site level for managing Indonesia's forests. The Protected Forest Management Unit (KPHL) is responsible for forest protection, water management, flood prevention, erosion control, prevention of seawater intrusion, and maintaining soil fertility. KPHL

[39] PB Vol. 12 No. 17 tahun 2018 RIL-C Kunci Sukses Pengelolaan Hutan Lestari dan Penurunan Emisi, Subarudi *et al*
[40] https://www.menlhk.go.id/site/single_post/4713, Hendroyono, 2022
[41] http://ppid.menlhk.go.id/siaran_pers/browse/1757

also facilitates the community to able to participate in programs related to the utilization of non-timber forest products and the provision of environmental services.

At the site level, KPHL assists communities in utilizing protected areas to support their livelihoods and involves communities in supporting forest protection.[42]

4.2. Opportunities

There are many opportunities for activities in the forestry sector that can be adapted to the national priority programs of the Ministry of Environment and Forestry, namely:

a. Deforestation and Forest Degradation.

Deforestation and forest degradation caused by many activities such as illegal logging, forest and land fires, mining, land conversion, and others are conditions that must be handled seriously by involving various stakeholders.

b. Peat Ecosystem Management

One of the causes of the greenhouse gas effect from the forestry sector is the occurrence of forest and land fires in peat areas. Peatland fires and food estate security for community welfare in Indonesia is currently a condition that requires a management strategy, so there is a need for peat ecosystem management.

c. Community-based Forest Management

Communities living in or around forest areas are currently partners in forest management. So in every forest management activity, it is necessary to intensify community involvement in forest management. Examples of forest management within the community are such as social forestry, Indigenous forest forest management, and protected forest management with the community. Community-based forest management is a pattern of forest management that must be continuously improved and improved in order to maintain the forest and the environment and create a prosperous society.

d. Biodiversity Conservation and Ecosystem Management

Indonesia has 554 designated conservation areas spread throughout all provinces of the country, covering 5.3 million hectares of marine conservation areas and 22.1 million hectares of terrestrial conservation areas. Biodiversity Conservation and Ecosystem Management currently being implemented are resort-based conservation area management, wild flora and fauna management, essential ecosystem area management, community-based conservation area management, and utilization of traditional zones with a partnership pattern.

e. Climate Change

Currently, climate change is a global challenge that must be faced together by all countries, so that in dealing with these conditions, international cooperation is needed.

[42] Status Hutan dan Kehutanan Indonesia 2020

4.2.1. Global Partnership

Until 2021, Indonesia has established many direct collaborations, which strongly support Indonesia in program activities in the environmental and forestry sectors. These collaborations are grouped into several categories, including:

a. **Cooperation with Non Goverment Organization (NGOs) and University** such as CIFOR, ACIAR, ICRAF, Yale University, Griffith University, The Ministry of Agriculture and Forestry of the Republic of Finland.
b. **Cooperation in Membership of International Organizations** such as ASEAN-ROK, AFoCO, IUFRO, APAFRI.
c. **Intra-Regional Bilateral Cooperation** such as ASOF, ASOEN, AMME, ACB, Norwegia, Jerman, Korea, Japan, USAID, England, and KSST.
d. **Multilateral Cooperation** namely UNEP, UNFF, UNEA, AIS Forum, GEF, AFoCO, ITTO, FAO, dan OINP.

4.2.2. Potentials

a. **Job Creation Law (Omnibus Law/UUCK) Number 11 of 2020**: Control of all environmental and forestry sectors is required for compliance with derivative regulations from UUCK.

b. **Forestry and Other Land Uses (FOLU) Net-Sink 2030** is the current forestry policy through the decree of the Minister of Environment and Forestry. Indonesia FOLU Net-Sink 2030 is a condition where the level of carbon sequestration in the forestry sector and other land uses is already balanced or even higher than the level of emissions produced by the sector in 2030.

c. **Ecotourism development** is one of the strategies where income can be obtained and at the same time involve the community in its management considering that there are still many places in Indonesia that have the potential to be developed.

d. **Peat Land and Mangrove restoration and rehabilitation** is one of the program activities that is very crucial at this time in Indonesia considering the conditions and benefits are very large and especially in supporting the reduction of greenhouse gas emissions.

e. **Non-Timber Forest Product** is an alternative to earn income by not always fully depending on forest products in the form of wood.

f. **The Development of the New State Capital City** needs to be fully controlled in its implementation in accordance with the spatial plan that has been prepared and with other rules to avoid environmental damage.

g. **Population Growth**: increasing human resource capacity, namely training people to be more productive in managing land, for example with the agroforestry model, so that people can still grow crops for food sources while maintaining forest and environmental sustainability. As well as the need for awareness among people in urban areas of the importance of protecting the environment by sorting waste starting from the household level so that it will make the recycling process easier.

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