

An aerial photograph showing a sharp boundary between a dense, green forest on the right and a cleared area on the left. The cleared area is covered with a thick layer of dry, brown branches and debris, indicating recent logging or deforestation.

Factsheet on
**Indonesia's
Forest Cover
Status in 2025**

Fact Sheet on Indonesia's Forest Cover Status in 2025

Writing Team:

Ogy Dwi A.
Aryo Adhi C.
Isnenti Apriani
Agung Ady S.
Ayudia Febrina
Annida Fauziyyatul A.
Eryana Nurwenda A.
Luluk Afifah
Andi Juanda
Khaerunnisa
Respati Bayu K.
Abd. Rakib Soumena
Fathan Hibatul W.
Nabilah Nurfazrina
Kandhita Puan N.
Hana Primanda R.

Layout Editor:

Fathan Hibatul W.

English Translation by:

Ni Kadek Ayu Septiari

Introduction

| Background

Indonesia is one of the world's mega biodiversity hotspots, with tropical forests that serve as habitats for thousands of endemic species and as vital ecosystem buffers. In addition to maintaining ecosystem balance, Indonesia's forests also play a role in climate change mitigation through carbon sequestration and storage. However, these functions continue to face pressure due to deforestation, forest degradation, and land-use conversion. Forest management in Indonesia still faces various challenges, ranging from weak governance, inconsistencies in spatial planning, unclear tenure rights, to low law enforcement capacity.

In 2022, the Ministry of Environment and Forestry (Kementerian Lingkungan Hidup dan Kehutanan/KLHK) released the Indonesia Forestry and Other Land Use (FOLU) Net Sink 2030 Operational Plan, a strategic policy instrument that sets a target for the forestry sector to achieve a net carbon sink status in support of the net-zero emissions target by 2060. Meanwhile, in 2024, the Ministry of Forestry also allocated an area of 20 million hectares for the expansion of food and energy reserves. This large-scale land allocation, accelerated by measures to streamline investment permitting, raises the likelihood of significant conversion of natural forest cover. The overlap between these policies demonstrates the government's lack of seriousness in curbing deforestation rates and meeting its emissions targets.

To address these challenges, forestry data is crucial for supporting monitoring, policy evaluation, and improved governance. However, public access to forestry data remains limited, including information on the permitting system, concession maps, and the status of forest areas. Yet, open access to information is a prerequisite for strengthening transparency, accountability, and public participation in forest management.

Although information transparency is regulated under Law No. 14 of 2008 on Public Information Transparency, its implementation in the forestry sector remains suboptimal. This situation is exacerbated by economic pressures from various sectors, particularly the palm oil sector, which often expands at the expense of good governance principles. Therefore, open access to forestry data is a critical prerequisite for supporting public oversight, policy evaluation, and more sustainable forest management.

Considering this, Forest Watch Indonesia (FWI) has taken the initiative to promote transparency in forestry by producing and managing forestry data that is accessible to the public. This fact sheet presents up-to-date information on the dynamics of natural forests to serve as a basis for policy advocacy and efforts to promote more transparent and sustainable forest management.

| Methodology

As an alternative forestry data and information center, Forest Watch Indonesia conducts annual analyses of natural forest cover using high-resolution satellite imagery from PlanetScope and Sentinel-2, with spatial resolutions of 5 meters and 10 meters, respectively. More than 100,000 forest and non-forest sample points are corrected and validated each year to ensure accurate and reliable analysis results. The classification process uses the Random Forest approach to improve the accuracy of land cover identification (Aulia et al. 2023).

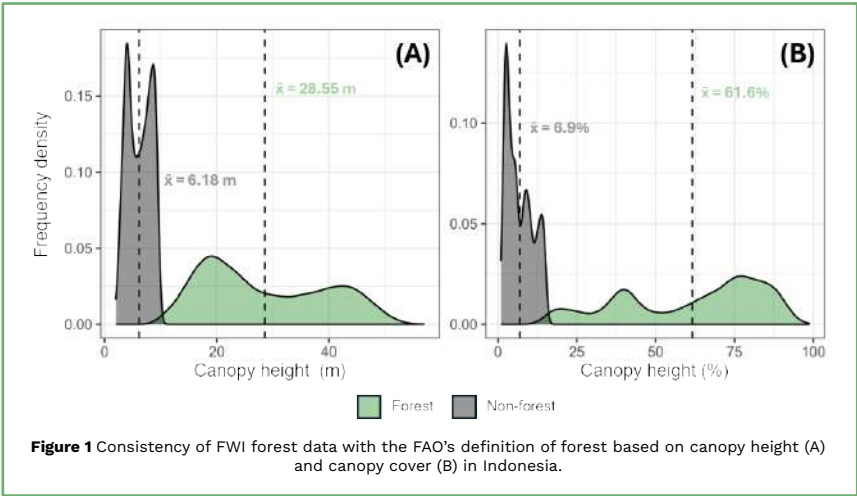
Consistency with the FAO Definition of Forest

Managing forests in Indonesia is apparently not as easy as one might imagine. Let alone the fieldwork, we still often ‘stumble’ over definitions even at the data level. Because the definition of “forest” is prone to shifting, interpretations by communities, institutions, and even the state vary. The impact is clear: these differing interpretations directly affect how our forests are managed.

To mitigate this, this study also investigates how well the natural forest data produced and analyzed by FWI aligns with the Food and Agriculture Organization’s (FAO) definition of forest, using various available geodata. The FAO defines a forest as an area larger than 0.5 hectares with a tree canopy height exceeding 5 meters and a canopy cover of more than 10%, or where trees meet or exceed these thresholds in situ, excluding areas used for agriculture or built-up land. This definition is also used and included in the international regulations regarding the EU Deforestation Regulation 1115 of 2023, specifically in Article 2, Paragraph 4. This indicates that the FAO’s definition of forest is a universally recognized standard accepted by the international community; therefore, this study also assesses the alignment of FWI forest data with the FAO definition.

To apply the FAO definition to FWI’s natural forest data, this study used the 2025 FWI forest data layer. This study also elaborated on canopy height data from Lang et al. (2023) as well as canopy cover data analyzed by the FWI team in this study. To estimate canopy cover, a Random Forest algorithm with 500 trees was used, based on predictors from PlanetScope spectral data ($n = 4$) with training data from GEDI L2B representing the percentage of tree canopy cover.

The results of the study show excellent agreement between the FWI forest data and the FAO definition. In terms of canopy height, the average canopy height identified in natural forests was (28.55 ± 11.01) meters, while non-forests had an average canopy height of (6.18 ± 2.08) meters. The average canopy height in the FWI forest data showed good agreement with the FAO definition, as the average canopy height exceeded the threshold of 5 meters. The higher standard deviation of canopy height in natural forests compared to non-forest areas indicates that the variation and complexity of canopy structure (in this case, tree height) are greater in forests than in non-forest areas (Figure 1A). Furthermore, this study also found that the FWI forest data has a statistical value for canopy cover of $61.6\% \pm 21.8\%$, while non-forest areas have a canopy cover of $6.9\% \pm 4.1\%$. This is also highly consistent with the FAO definition, where the threshold for forest classification requires canopy cover to exceed 10% (Figure 1B). Regarding the FAO-defined forest plot size (i.e., greater than 0.5 hectares), the analysis of FWI forest data involved filtering the data to select only forest plots with an area greater than 0.5 hectares from the final dataset of Indonesia's natural forests. Therefore, FWI's natural forest data in Indonesia aligns with the FAO's definition of forest, based on three components (canopy height, canopy cover, and forest plot area).



Level of Fragmentation

Fragmentation analysis was conducted in accordance with the methodology described by Potapov et al. (2017), which defines forests that still qualify as Intake Forest Landscape (IFL) as those consisting of patches with a minimum area of 50,000 hectares and a 1 km buffer zone, free from significant human disturbance. A distance of 1 km from an IFL serves as the threshold for connectivity between forest landscapes, so if a forest patch is more

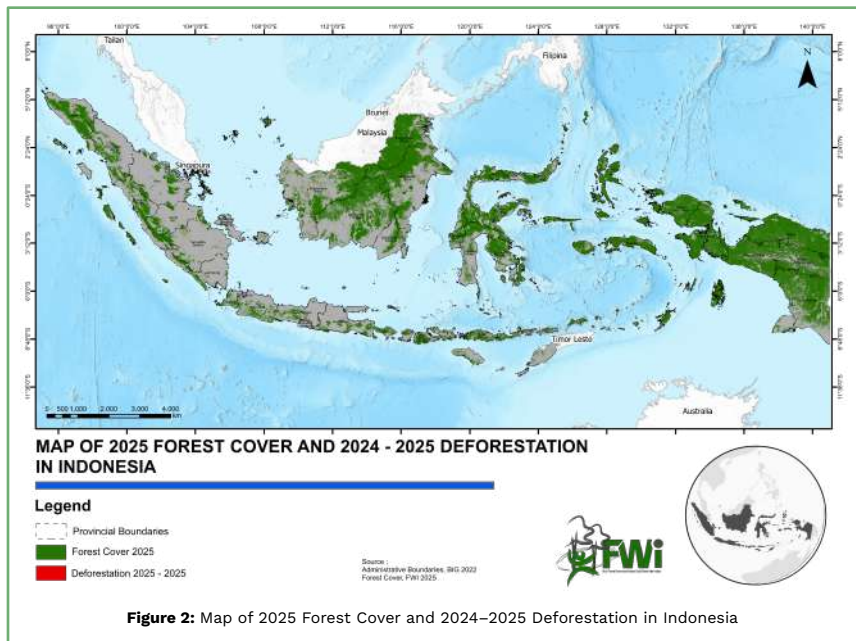
than 1 km away and has an area of less than 50,000 hectares, then it can be considered fragmented. Fragmentation levels are divided into three categories:

Table 1 Fragmentation Level		
Fragmentation Level	Forest Patch Area (hectares)	Distance from the IFL
Severely Fragmented	< 50	1 km
Fragmented	50 - 10,000	1 km
Moderately Fragmented	10,000 - 50,000	1 km

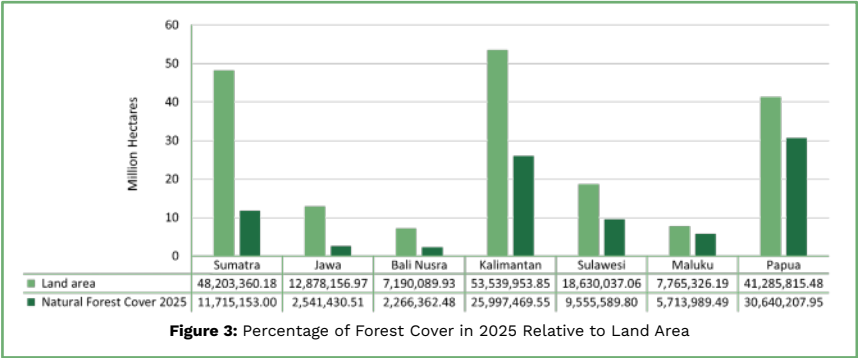


The State of Forest Cover and Deforestation in Indonesia from 2024 to 2025

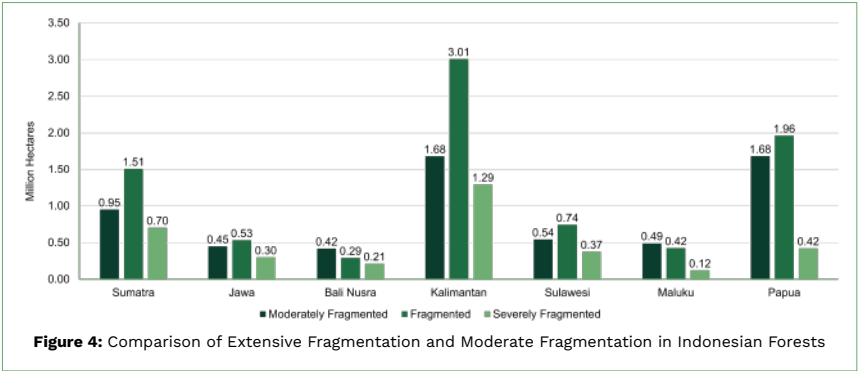
The results of this study indicate that Indonesia's remaining natural forest area in 2025 will be 88.43 million hectares, or 47% of the total land area. This area has decreased by 1.06 million hectares compared to 2024, when the natural forest area was 89.5 million hectares. This figure was derived from the output of the Random Forest model, which has proven highly effective in predicting Indonesia's forest cover, with an Overall Accuracy of 0.984 ± 0.003 and a Kappa Coefficient of 0.967 ± 0.003 .



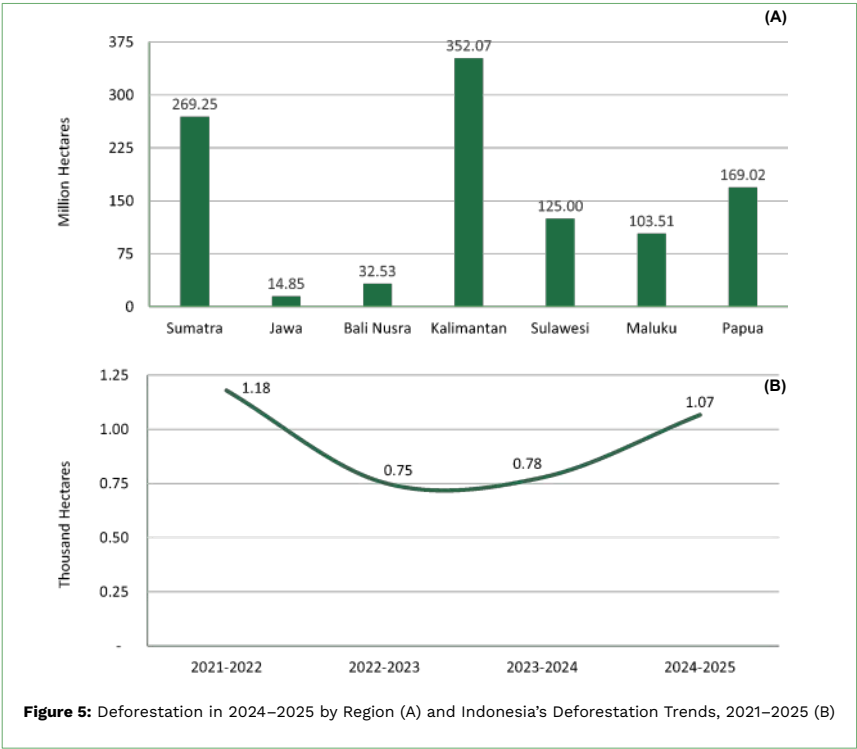
Indonesia’s natural forests are spread across seven regions representing the country’s major islands, namely Papua, Kalimantan, Sumatra, Sulawesi, Maluku, Java, and Bali-Nusa Tenggara. 64% of Indonesia’s remaining natural forests are located in the Papua Region (30.64 million hectares) and Kalimantan (25.99 million hectares). However, when viewed in terms of the FCR (Forest Cover Ratio), the proportion of remaining natural forest cover to total land area, the regions with the highest FCR values are in eastern Indonesia, namely Papua and Maluku, both with an FCR of 74%. Java and Sumatra are the regions with the lowest FCR values, at 24% and 20%, respectively.



In addition to analyzing Indonesia’s remaining natural forests, this study also examines whether these remaining forests still possess good ecosystem functions. This is assessed by examining the level of fragmentation of the identified natural forests. Technically, in spatial and landscape ecology analysis, the level of forest fragmentation is a quantitative measure that describes the extent to which an intact forest block, such as an Intact Forest Landscape with a patch area of more than fifty thousand hectares (Potapov et al. 2025), has been broken up into smaller, isolated patches (fragments) due to non-forest land cover (Ritters et al. 2002).

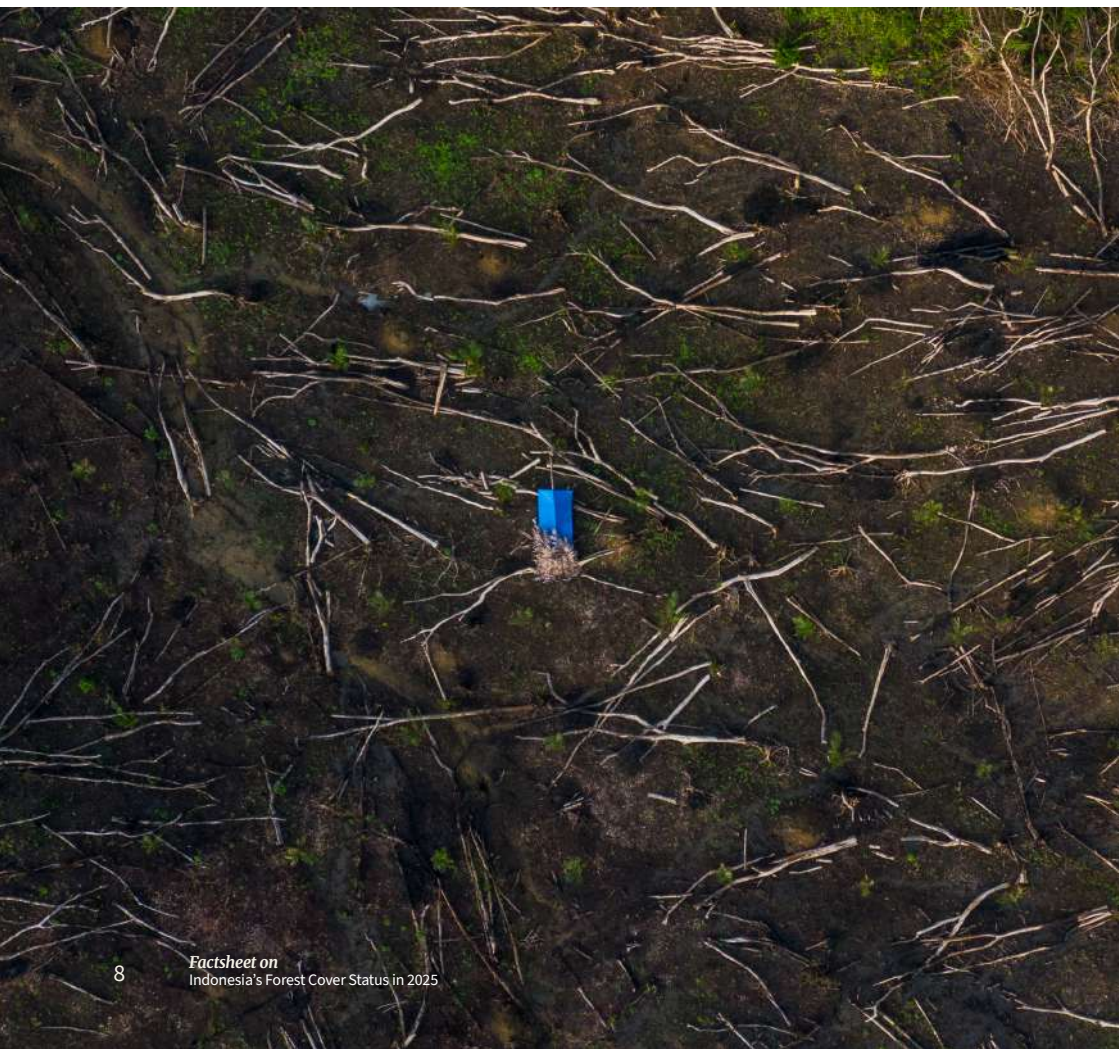


Of the total 88.43 million hectares of identified natural forest, 3.9% or 3.4 million hectares are heavily fragmented natural forests, 9.6% (8.47 million hectares) fall into the fragmented category, 7% (6,2 million hectares) fall into the moderately fragmented category, and the remaining 80% (70.3 million hectares) still constitute intact natural forest landscapes. The Kalimantan and Sumatra regions have the largest areas of heavily fragmented natural forests, at 1.29 million hectares and 703.12 thousand hectares, respectively. Papua has the largest area of intact natural forest, at 26.51 million hectares, representing more than 30% of its remaining natural forest by 2025. On the other hand, 1.68 million hectares of Papua’s natural forests have begun to experience fragmentation, albeit at a moderate level; this indicates that a significant amount of forest clearing activity has already begun, leading to a reduction in the area of intact forest landscapes in this last bastion of Indonesia’s forests.

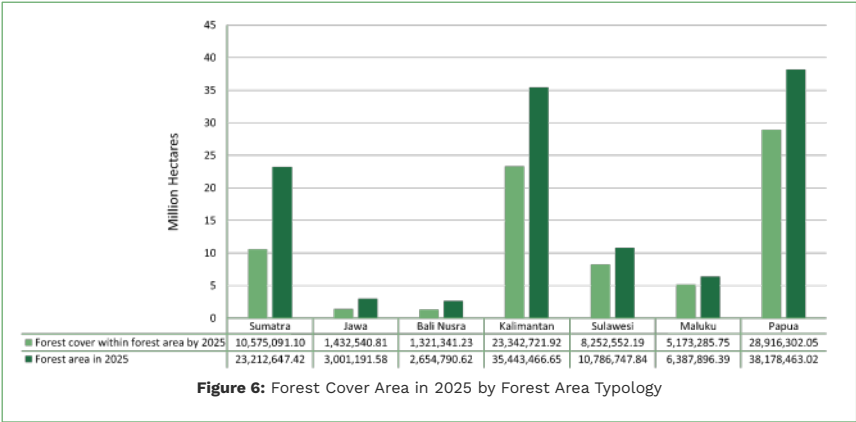


Forest fragmentation and habitat loss are closely linked to rising deforestation rates in a region (Samsuri et al. 2021). Kalimantan is the region with the highest deforestation rate for the 2024–2025 period, at 352.06 thousand hectares, followed by Sumatra (269.25 thousand hectares) and Papua (169.02 thousand hectares).

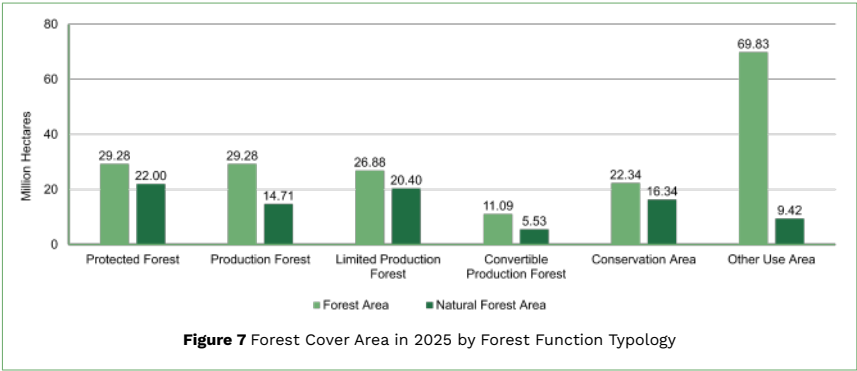
In terms of trends, deforestation in 2024–2025 saw a significant increase compared to the previous year, amounting to 37%. Nearly all regions experienced an increase in deforestation, and Kalimantan once again recorded the largest increase, with total deforestation rising from 227.49 thousand hectares in 2023–2024 to 352.06 thousand hectares in 2024–2025. The Java and Bali-Nusra regions were the only two to experience a decline in deforestation, a trend closely linked to the fact that these regions have very little natural forest remaining.



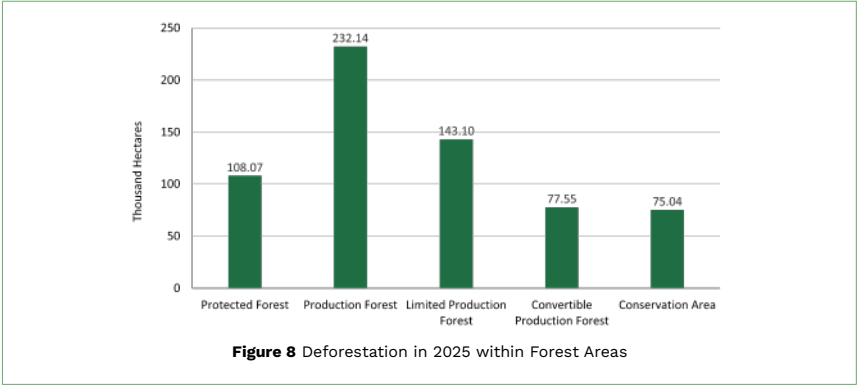
Forest Cover and Deforestation Conditions in the Designation of Forest Areas



According to Minister of Environment and Forestry Regulation No. 7 of 2021 on Forest Planning, Changes in the Designation and Function of Forest Areas, and the Use of Forest Areas, a forest area is a specific area designated by the government to be maintained as permanent forest on land not encumbered by land rights. Forest areas are classified into three main functions: conservation, protection, and production. Areas outside these three functions are categorized as Other Use Areas (Areal Penggunaan Lain/APL), the management of which falls outside the authority of the Ministry of Forestry. The total area of Indonesia's forest areas in 2025 is 124.52 million hectares, of which only about 66% (79.01 million hectares) currently consists of actual forest cover. Based on this forest cover area, the Maluku and Papua regions still have high ratios of forest cover to total forest area, reaching 80.99% and 75.74%, respectively. Meanwhile, the Sumatra region stands in stark contrast, with only 45.56% of the total forest area remaining.



The graph above shows the extent of Forest Areas and Other Use Areas (APL) with remaining natural forest in 2025. The Forest Area with the largest remaining natural forest is the Protected Forest Area, at 22 million hectares. Meanwhile, the Limited Production Forest Area still has a fairly large remaining natural forest area, at 20.40 million hectares. This situation could actually pose a threat to the survival of natural forests due to the potential issuance of permits for the use of Forest Areas. However, areas designated as protected zones, such as Conservation Areas, contain only 14.71 million hectares of remaining natural forest (73% of the total area of Conservation Areas). On the other hand, FWI also found that 9.42 million hectares of remaining natural forest are located within APL areas. These findings reveal a discrepancy between the designation of forest areas and the natural forests actually present within them.



Deforestation within Forest Areas in 2025 reached 635.86 thousand hectares, while in other use areas it reached 429.90 thousand hectares. The greatest deforestation occurred in

Production Forest Areas, followed by Limited Production Forests and Protected Forests. Deforestation does indeed occur predominantly in Production Forest Areas, which is legally permissible because these areas are subject to forest utilization permits. However, of particular concern is the loss of forest cover in Protected and Conservation Areas, covering 108.06 thousand hectares and 75.03 thousand hectares, respectively. Deforestation in these two zones has the potential to cause negative environmental impacts, as these areas serve as ecosystem buffers, support nature conservation and biodiversity, and enable sustainable use.



Forest Cover and Deforestation in Key Ecosystems

Forest Cover and Deforestation in Key Biodiversity Area and Habitat Flagship Species

Key Biodiversity Areas (KBAs) are areas that contribute significantly to the sustainability of global biodiversity across terrestrial, freshwater, and marine ecosystems. These areas are identified based on scientifically established criteria outlined in “A Global Standard for the Identification of Key Biodiversity Areas,” published by the International Union for Conservation of Nature (IUCN) in 2016 (IUCN 2016). This standard also incorporates various pre-existing approaches to identifying important areas, including Important Bird and Biodiversity Areas (IBAs).

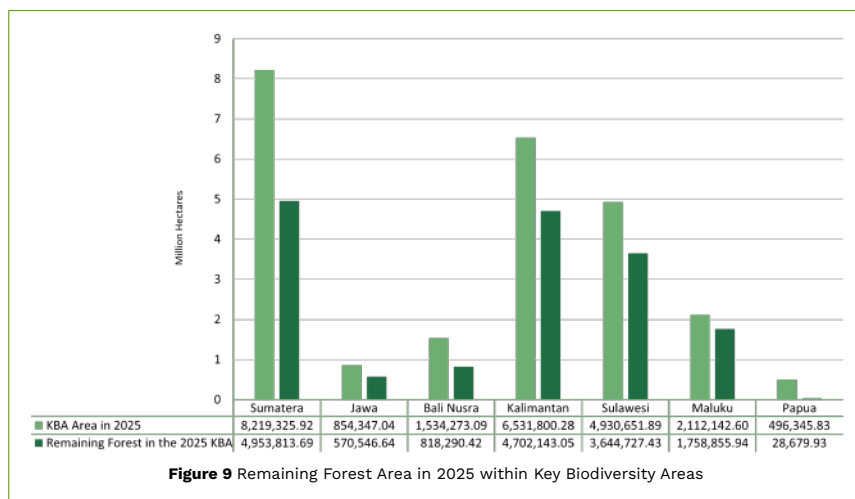


Figure 9 Remaining Forest Area in 2025 within Key Biodiversity Areas

The 2026 FWI analysis shows that there are 24 million hectares of KBA spread across all regions of Indonesia, with the largest KBA area located in the Region of Sumatra at 8.22 million hectares. More than half of the KBAs remain intact, as they are still covered by 16.48 million hectares of natural forest. Although most KBAs are still dominated by forest cover, deforestation continues. During the 2024–2025 period, FWI recorded deforestation covering 160,000 hectares across all KBAs in Indonesia.

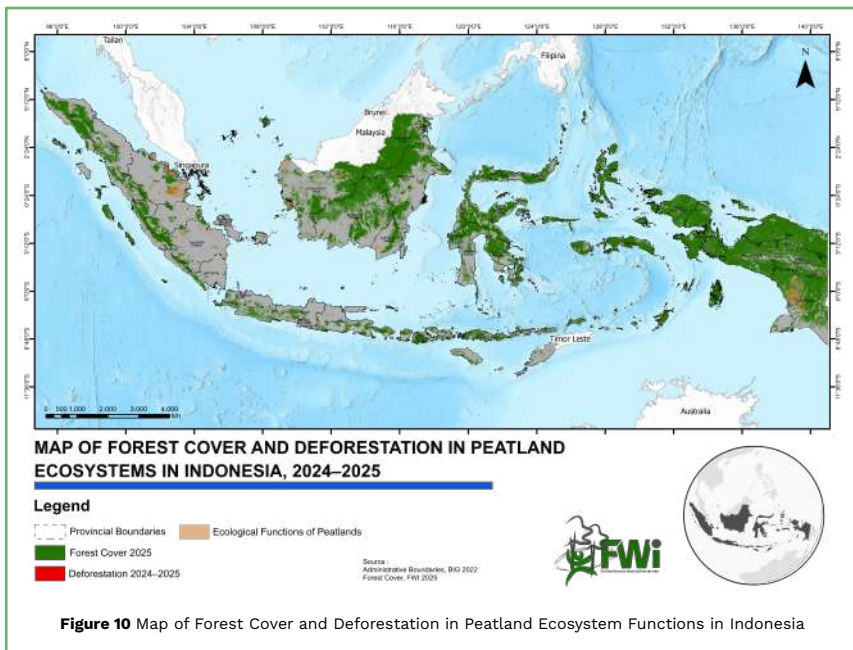
Region	PBPH	Plantation	Mining	Overlap	Total
Sumatra	1,100,967.60	163,381.12	89,884.97	78,685.95	1,432,919.64
Jawa	-	-	4,647.82	-	4,647.82
Bali Nusra	33,118.91	-	46,495.60	3.47	79,617.98
Kalimantan	1,152,521.38	458,810.84	80,318.87	129,256.97	1,820,908.06
Sulawesi	109,199.56	43,240.55	161,462.86	15,731.36	329,634.33
Maluku	324,577.43	6,397.12	57,743.93	42,207.04	430,925.52
Papua	-	-	457,441.68	38,904.15	496,345.83
Total	2,720,384.88	671,829.63	897,995.73	304,788.94	4,594,999.18

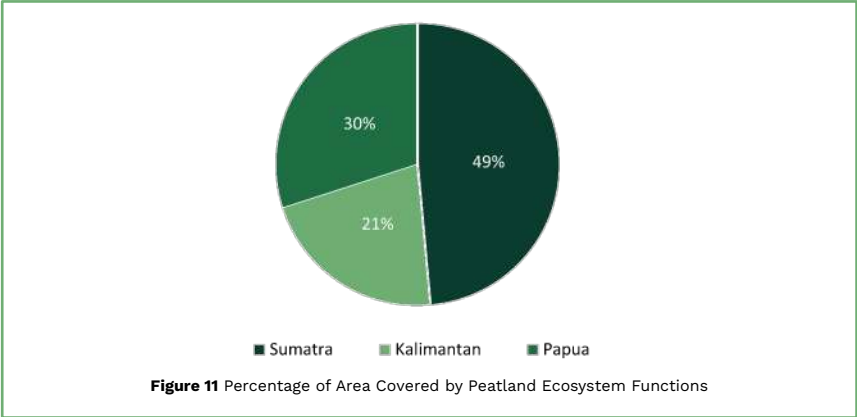
The presence of concessions poses a potential threat to biodiversity conservation; particularly within Key Biodiversity Areas (KBAs), where 19% (4.59 million hectares) of the total KBA area is already encumbered by various concession permits. Kalimantan is the region with the largest concession area within KBAs, covering approximately 1.82 million hectares. Based on permit type, Forest Utilization Business License (Perizinan Berusaha Pemanfaatan Hutan/PBPH) permits dominate the largest area at 2.72 million hectares—more than half of the total concession area within the KBA.

In fact, in Indonesia, several KBAs serve as habitats for various flagship species such as elephants, tigers, orangutans, rhinos, and birds of paradise. FWI’s analysis shows that among these five groups of flagship species, the Bornean orangutan’s habitat covers the largest area, at 11.89 million hectares, followed by the Sumatran tiger and the Javan rhinoceros, with areas of 9.84 million hectares and 2.54 million hectares, respectively. Overall, more than 94% of the habitat for each of these flagship species is still forested. Nevertheless, deforestation continues to occur in each habitat. When looking at the percentage of deforestation relative to the total habitat area, elephants in Sumatra and Kalimantan face the highest deforestation threat at 2.11%, equivalent to 46,000 hectares. Meanwhile, the lowest rate of deforestation occurs in the habitat of the bird-of-paradise, at 0.41%, equivalent to 5,000 hectares.

Forest Cover and Deforestation in Peatland Ecosystem Function Areas

Peatland Ecosystem Functions (Fungsi Ekosistem Gambut/FEG) play a vital role in preserving biodiversity, carbon storage, oxygen production, and water management (Cole et al. 2015). Based on the Director General of PPKL Regulation No. P.1/PPKL/0/2019 regarding the Implementation of Ministry of Environment and Forestry Regulation No. 14 of 2017 on Procedures for the Inventory and Determination of Peat Ecosystem Functions, peat depth characteristics are classified as follows: (a) non-peat or mineral soil with a depth of 0–50 cm, (b) peat soil with a cultivation function for peat depths of 50–300 cm, and (c) peat soil with a conservation function for depths of ≥ 300 cm. These depth characteristics distinguish Peatland Ecosystem Functions into two management categories, namely Peatland Ecosystem Conservation Functions (Fungsi Lindung Ekosistem Gambut/FLEG) and Peatland Ecosystem Cultivation Functions (Fungsi Budidaya Ekosistem Gambut/FBEG).





FWI notes that in 2024–2025, Indonesia has 4.04 million hectares of Peatland Ecosystem Functions, of which 1.25 million hectares fall under FLEG and the remaining 2.79 million hectares under FBEG. The largest area of FEG is located in the Sumatra region, accounting for 49% or 1.96 million hectares, followed by Papua with 1.21 million hectares and Kalimantan with 867,000 hectares.

Table 3 Forest Cover and Deforestation in Peatland Ecosystem Functions for the 2024–2025 Period

Region	FLEG	FBEG	FLEG	FBEG	Total Peatland Area (Ha)
Sumatra	276,196.85	126,182.57	4,058.78	8,323.00	1,963,180.53
Kalimantan	70,177.22	201,305.66	1,041.97	6,234.41	867,901.22
Papua	149,317.19	583,562.40	2,066.04	12,452.80	1,211,683.61
Total (ha)	495,691.26	911,050.62	7,166.79	27,010.21	4,042,765.35

The natural forests identified within the 2025 FEG cover 1.4 million hectares, or 35% of the total FEG area. The Papua Region (732,880 hectares) has the largest remaining area of natural forest within the FEG, although the Sumatra Region has the largest FEG area overall. When viewed by function, the FBEG has 911 thousand hectares of remaining natural forest (33% of its total area), while the FLEG has 495 thousand hectares of natural forest, or 40% of its total area.

Deforestation occurring in 2025 within the Peatland Ecosystem Function covered an area of 34 thousand hectares. The highest rate of deforestation occurred within the FBEG, covering 27 thousand hectares, compared to 7 thousand hectares within the FLEG. Table 2 shows that the largest deforestation within the FBEG occurred in Papua, covering 12 thousand hectares, while within the FLEG, the largest deforestation occurred in Sumatra,

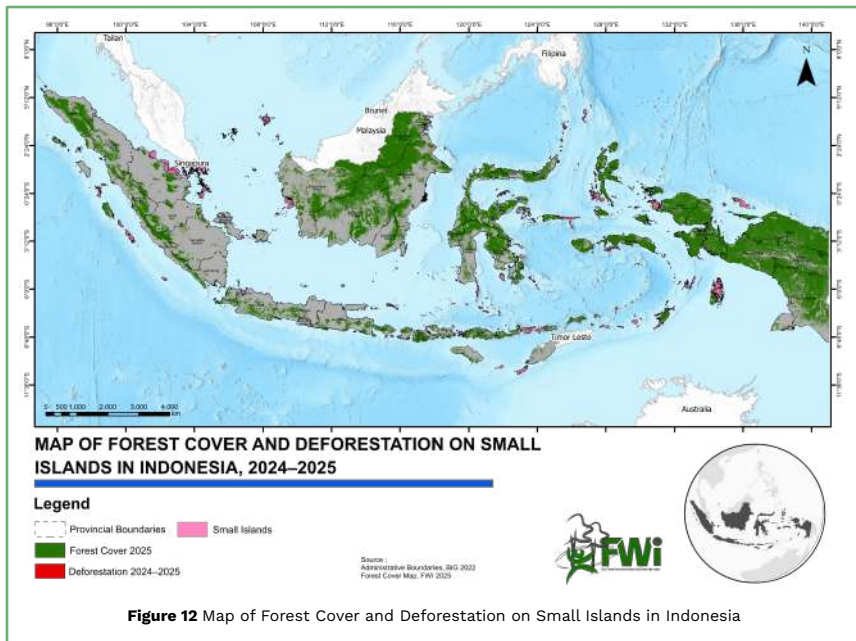
covering 4 thousand hectares. The high levels of deforestation in the FBEG and FLEG indicate that land clearing activities are taking place in areas where industrial activities should not be occurring.

Table 4 Concession Areas by Peatland Ecosystem Function						
Types of Permits	Area		Deforestation 2024–2025		Natural Forest Cover in 2025	
	FLEG	FBEG	FLEG	FBEG	FLEG	FBEG
PBPH	266,924.16	203,261.15	845.66	2,844.06	82,217.83	81,796.22
Plantation	222,624.53	591,447.59	1,363.37	3,818.79	28,128.98	171,405.67
Mining	283.23	11,903.74	-	1.03	1.65	12.33
Overlapping Permits	1,658.52	19,748.68	10.5	78.27	102.76	3,637.56
Beyond the Scope of the Permit	756,369.08	1,968,590.35	4,947.26	20,268.12	385,240.05	654,198.78
Total (ha)	1,247,859.52	2,794,951.50	7,166.80	27,010.27	495,691.27	911,050.56

Further analysis by FWI shows that Indonesia’s FEGs are also under pressure from extractive activities carried out under land-based concessions. A total of 1.3 million (48%) hectares of FEGs have been encumbered by land-based concessions, covering 826 thousand hectares in the Cultivation Zone and 491 thousand hectares in the Conservation Zone. The largest type of permit within the FEG area is oil palm plantations, covering 814 thousand hectares. Overlaps with these land-based concessions have contributed to deforestation within the FEG covering 8.96 thousand hectares, or 26% of the total deforested area. The majority of deforestation still occurs outside these overlapping areas.

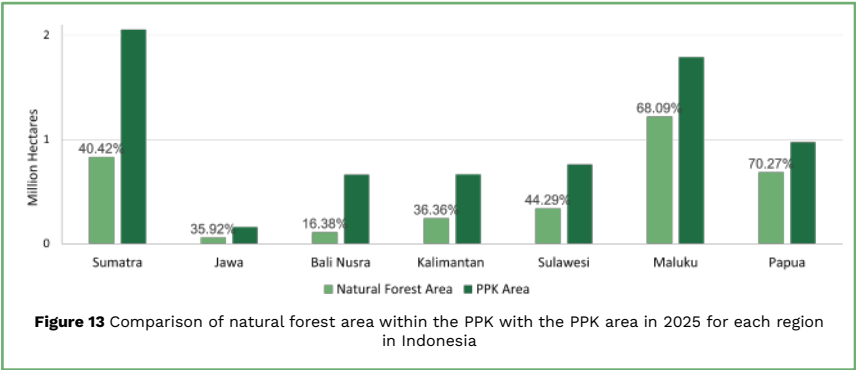
Forest Cover and Deforestation on Small Islands

Coastal Areas and Small Islands (Pesisir dan Pulau-Pulau Kecil/PPK) possess a high potential for natural resource diversity and provide various environmental services and livelihoods for communities. However, their limited and vulnerable nature to environmental changes means that Coastal Areas and Small Islands require sustainable management and protection (Moncada and Nguyen 2024). Law No. 1 of 2014, which amends Law No. 27 of 2007, regulates the Management of Coastal Areas and Small Islands (Pengelolaan Wilayah Pesisir dan Pulau-pulau Kecil/PWP3K). This law defines a small island as an island with an area of less than or equal to 2,000 km², along with its ecosystem unit.

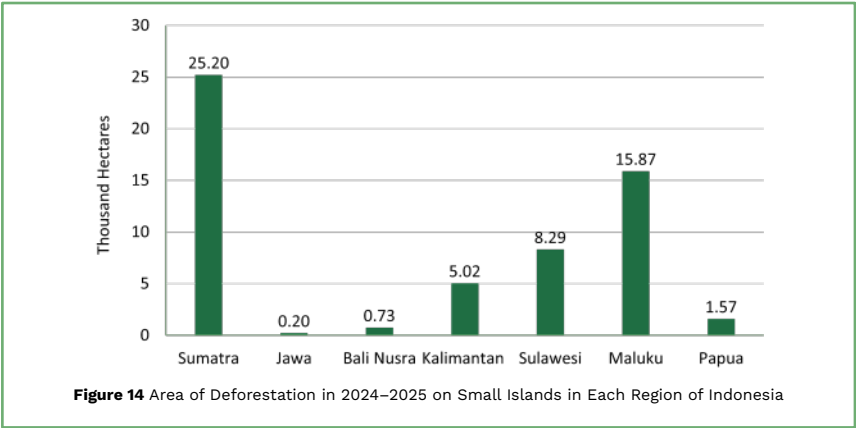


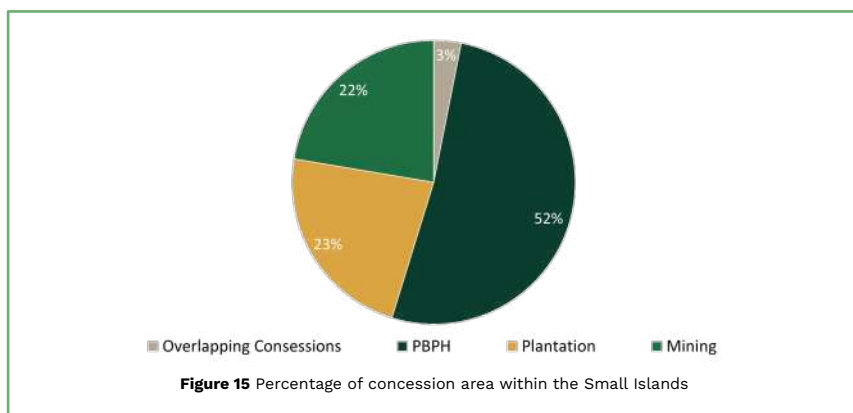
FWI's analysis shows that by 2025, the number of identified PPKs will total 18,630, covering an area of 7.06 million hectares. These islands are spread across 7 regions, including the Sumatra Region with an area of 2.05 million hectares, Java with an area of 158,550 hectares, Bali-Nusra with an area of 661,810 hectares, Kalimantan with an area of 664,220 hectares, Sulawesi with an area of 758,260 hectares, Maluku, covering 1.78 million hectares, and Papua, covering 973.05 thousand hectares. These small islands still have natural forests covering 3.43 million hectares, or 49% of their total land area, with the

largest proportions of natural forests found in Papua and Maluku at 70.27% and 68.09%, respectively.

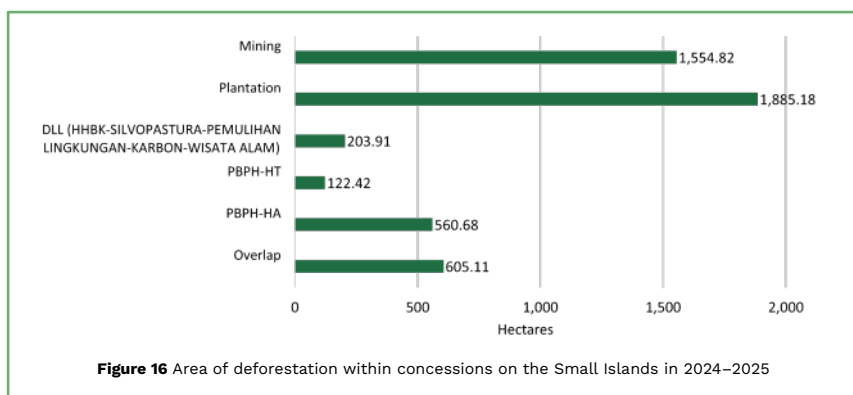


The remaining natural forests on small islands in 2025 have declined significantly. FWI's analysis shows that total deforestation in the PPK areas in 2024–2025 reached 56.88 thousand hectares, equivalent to 5.33% of the national deforestation that occurred during that period. This area has nearly doubled compared to the deforestation in 2023–2024, which stood at 28.31 thousand hectares. The highest rates of deforestation occurred in the Sumatra and Maluku regions, with areas of 25.20 thousand hectares and 15.87 thousand hectares, respectively. Meanwhile, Java, Bali-Nusra, and Papua had relatively low levels of deforestation, at 195.33 hectares, 726.89 hectares, and 1,572.15 hectares, respectively.





Land-based concessions continue to place serious pressure on the remaining natural forests within the PPK. The PWP3K Law explicitly prohibits activities that have the potential to cause environmental damage on the Small Islands, such as mining, which can alter the landscape and destroy the islands' ecosystems (MK 2024). As of 2024–2025, FWI has recorded a total of 216 concession permits, covering an area of 883,000 hectares, located within the Small Islands. In percentage terms, PBPH permits constitute the largest category within the PPK, accounting for 52% of the total concession area in the PPK. Furthermore, plantation concessions account for 23% of the total concession area within the PPK, which undoubtedly poses a massive threat to the remaining natural forests.

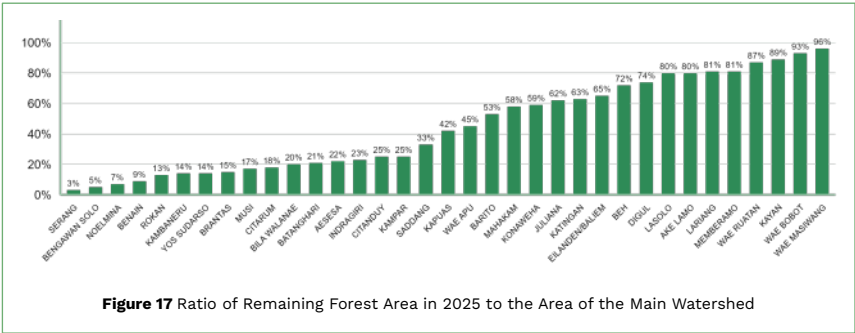


FWI recorded that in 2025, total deforestation within concessions located in the PPK covered an area of 4 thousand hectares. The largest areas of deforestation by concession were in the Sumatra, Maluku, and Kalimantan regions, covering 2.4 thousand hectares, 1.08 thousand hectares, and 684 hectares, respectively. Deforestation within concessions

is dominated by the plantation and mining sectors, which each contribute approximately 38% and 35.9%, respectively, to total deforestation occurring within concessions under the PPK. Deforestation within overlapping concession areas totaled 650 hectares, followed by PBPH-HA at 560 hectares. This deforestation will continue to increase each year, as Law No. 6 of 2023 on Job Creation, which streamlines the permitting process on Small Islands to boost investment, remains in effect

Forest Cover and Deforestation in Critical Watersheds

Watersheds play a role in maintaining ecological balance, providing natural resources, and protecting surrounding areas from various natural disasters. Based on Government Regulation No. 37 of 2012 on Watershed Management, the categorization of watersheds is determined by five main aspects, physical land conditions (critical land, vegetation, and erosion), hydrological conditions (flow regulation, sediment, flooding, and water use), the socioeconomic conditions of the population (well-being, land-use pressure, and regulations), investment in water infrastructure (city classification and assets), and land-use patterns (protected areas and agricultural zones).



As of 2026, there were 41,382 watersheds across the Indonesian mainland recorded by the Ministry of Forestry. An analysis by FWI shows that only 36% of these watersheds have remaining natural forest cover of >30% of their total watershed area. According to Tarigan et al. 2018, 30% forest cover is necessary to maintain the sustainability of ecosystem services within a watershed landscape. Of the 41,382 watersheds across Indonesia, FWI attempted to conduct a more in-depth analysis of 35 watersheds, which are the five largest watersheds based on area within their respective regions.

The total area of these 35 watersheds is 72.8 million hectares, while the remaining forest area within these major watersheds is 34.48 million hectares (47% of the total watershed

area). Of these 35 major watersheds, 16 have a forest cover ratio below the 30% threshold, and can therefore be classified as critical watersheds. These critical watershed conditions are most prevalent in the Java, Sumatra, and Bali-Nusra regions. In fact, several watersheds in Java and parts of Sumatra have recorded extremely low forest cover rates, such as the Serang (3%), Bengawan Solo (5%), and Rokan (13%) watersheds. These low figures reflect high demographic pressure as well as massive land conversion for other purposes in these regions.

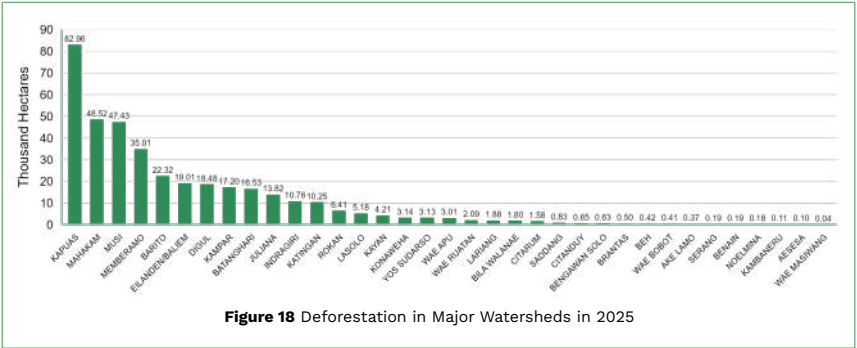


Figure 18 Deforestation in Major Watersheds in 2025

In 2025, total deforestation across the 35 major watersheds reached 379.35 thousand hectares. Watersheds in the Kalimantan region recorded the highest deforestation at 168.27 thousand hectares, followed by the Sumatra region (98.33 thousand hectares) and the Papua region (89.45 thousand hectares). Meanwhile, when viewed specifically by watershed, Kapuas (West Kalimantan) and Mahakam (East Kalimantan) were the watersheds with the highest rates of deforestation, reaching 82.96 and 48.54 thousand hectares, respectively.

High deforestation also occurred in the Musi Watershed (South Sumatra), which lost 47.43 thousand hectares of forest area. Currently, the Musi Watershed has only 1.13 million hectares of natural forest remaining, equivalent to 17% of the total area of the watershed. Given these conditions, the minimal remaining forest cover reflects the poor health indicators of most watersheds in Indonesia today. Therefore, an analysis of these major watersheds can serve as a reference for the government or relevant agencies in determining priority locations for Forest and Land Rehabilitation (Rehabilitasi Hutan dan Lahan/RHL) programs.

Forest Cover and Deforestation Conditions in Land-Based Concessions

Forest Cover and Deforestation 2024–2025 in PBPH, Oil Palm Plantations, and Mines

By 2025, FWI has identified 54.8 million hectares of land-based concessions (PBPH, plantations, and mines) in Indonesia, or nearly 30% of the total land area. The largest category of concessions is PBPH (HA, HT, NTFP, silvopasture, and others) covering 27.68 million hectares, followed by plantations covering 17.38 million hectares and mining concessions covering 4.5 million hectares. There is also an overlap between concessions covering 5.24 million hectares.

Table 5 Concession Areas and Overlaps by Region in Indonesia						
Region	Overlap	PBPH			Plantations	Mining
		HA	HT	NTFP-Silvopasture-Others		
Sumatra	525,249.82	743,045.23	4,262,695.42	427,302.13	3,745,909.24	1,383,294.00
Jawa	-	-	-	-	-	99,009.05
Bali Nusra	698.71	27,336.49	129,220.34	-	747.54	149,210.48
Kalimantan	4,122,171.44	9,367,426.24	3,855,549.44	423,927.57	10,494,985.69	1,358,945.35
Sulawesi	55,579.65	460,691.51	218,883.67	20,093.34	302,619.46	867,295.68
Maluku	226,998.45	1,292,474.49	58,311.26	-	38,984.26	386,267.12
Papua	313,906.11	5,365,941.12	804,882.29	224,917.09	2,796,576.09	250,561.03
Total (ha)	5,244,604.18	17,256,915.08	9,329,542.41	1,096,240.13	17,379,822.29	4,494,582.70

When viewed in terms of their distribution and proportion of land area, the largest concessions are located in the Kalimantan region, where half of its land area (53.54 million hektare) is already encumbered by land-based concessions, followed by Maluku with a concession area of 7.77 million hectares or 26% of its land area and Papua with a concession area of 9.76 million hectares or 24% of its total land area.

In 2025, FWI’s analysis shows that 24.78 million hectares of natural forest (28% of total natural forest) are within land-based concessions, broken down as follows: 17.75 million hectares for PBPH, 3.24 million hectares for plantations, 1.6 million hectares for mining, and 2.14 million hectares of overlapping concessions.

Table 6 Deforestation in concessions and overlaps by region in Indonesia

Region	Deforestation in Concessions, 2024–2025						Total Deforestation in Concessions, 2024–2025
	Overlaps	PBPH			Plantation	Mining	
		HA	HT	NTFP-Silvopasture -Others			
Sumatra	5,396.26	9,039.89	26,035.74	2,275.74	12,755.39	11,504.26	67,007.28
Jawa	-	-	-	-	-	509.29	509.29
Bali Nusra	2.22	1,931.62	1,110.82	0.00	88.36	569.59	3,702.61
Kalimantan	50,246.04	36,628.58	63,147.04	223.36	90,926.39	13,450.35	254,621.76
Sulawesi	1,219.53	1,784.51	1,762.37	1.58	4,621.69	11,574.15	20,963.82
Maluku	2,253.16	16,905.16	153.84	0.00	667.16	3,709.39	23,688.71
Papua	2,316.55	18,372.75	2,831.91	390.25	24,595.72	796.04	49,303.22
Total (ha)	61,433.76	84,662.51	95,041.71	2,890.93	133,654.70	42,113.06	419,796.68

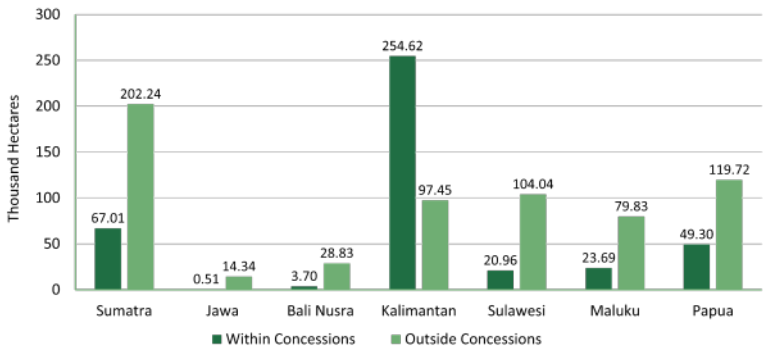


Figure 19 Deforestation in concessions by region in Indonesia in 2025

Deforestation within licensed concessions remains one of the primary factors driving forest loss in Indonesia during the 2024–2025 period. Nearly 40% (419,800 hectares) of total national deforestation occurred within land-based concessions. Based on permit type, deforestation within concessions occurred most frequently in Plantation Areas, covering 133,650 hectares, Plantation Forest PBPH at 95,000 hectares, Natural Forest PBPH at 84,660 hectares, and Mining at 42,110 hectares. In addition, approximately 61.43 thousand hectares of deforestation occurred in areas with overlapping permits.

Geographically, the largest amount of deforestation within concessions occurred in Kalimantan, covering an area of 254.62 thousand hectares, which accounted for more than half of the total deforestation in concession areas nationwide. This was followed by Sumatra at 67.01 thousand hectares, Papua at 49.30 thousand hectares, Maluku at 23.69 thousand hectares, Sulawesi at 20.96 thousand hectares, Bali Nusra at 3.70 thousand hectares, and Java at 509 hectares.



Forest Cover and Deforestation 2024–2025 in Social Forestry

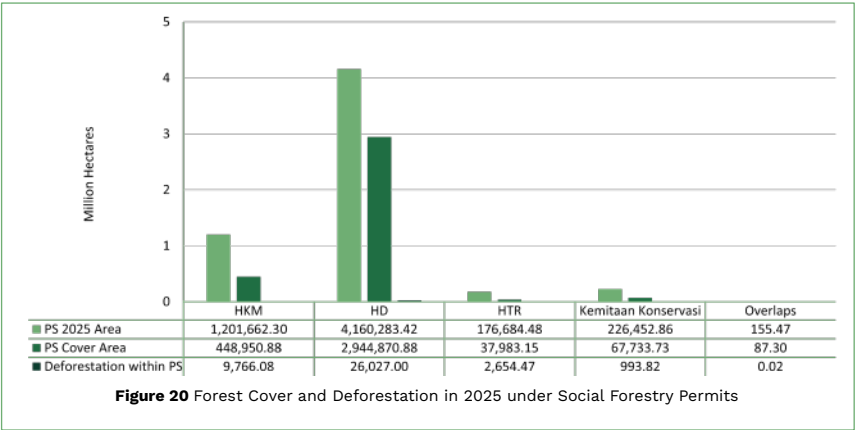
Social Forestry (Perhutanan Sosial/PS) is essentially a government policy that grants management rights to communities so they can manage forests sustainably, derive economic benefits, and preserve ecosystem functions. Its primary objectives are to empower local communities, reduce tenure conflicts, and ensure the forests remain sustainable. As outlined in the technical regulations on PS (Ministry of Environment and Forestry Regulation No. 9/2021 on Social Forestry Management), there are five main types of PS schemes regulated in the regulations, namely:

1. Community Forests (Hutan Kemasyarakatan/HKm): production forest areas managed by community groups for empowerment;
2. Village Forests (Hutan Desa/HD): forests not yet subject to permits and managed by villages for the well-being of the village community;
3. Community Plantation Forests (Hutan Tanaman Rakyat/HTR): timber plantations in production areas established by communities using silvicultural systems;
4. Forestry Partnerships (Kemitraan Kehutanan/KK): collaborations between communities and other parties (such as national parks or concession holders) in the form of Conservation Partnerships;
5. Customary Forests: forests located within the territory of Indigenous communities, with official recognition from the state.¹

The PS data used in this study is a compilation by FWI through the end of 2024, covering an area of 5.7 million hectares (excluding Customary Forests). Aggregately, the HD scheme remains the one with the largest designated area, at 4.1 million hectares (72.1% of total PS

¹ Although the Customary Forest scheme is, by regulation, part of the PS program, in this study we have separated it from the analysis of other schemes. There are two main reasons for this: first, the difference in the legal status of the land. Following Constitutional Court Decision No. 35/PUU-X/2012 on Customary Land Rights of Indigenous Communities, which affirmed that customary forests are forests under customary rights, not state forests. Under other PS schemes such as HKm, HD, HTR, and KK, the land status remains within Forest Areas, and communities are granted only management rights or utilization permits. In contrast, for Customary Forests, once the state issues a recognition decree (Surat Keputusan/SK), the land no longer holds the status of state forest and is reclassified as a rights forest (customary ownership). The second reason concerns the complexity of the verification process and legal subjects. Establishing a customary forest requires multiple layers of criteria that are more complex than those for other schemes. Local governments must first issue a Local Regulation (Peraturan Daerah/Perda) to recognize the existence of the Indigenous Peoples as legal entities. Because this process requires cross-sectoral involvement with different bureaucratic channels and reporting procedures, it takes a long time to issue the recognition decree. Due to the two fundamental reasons above, the analysis regarding Customary Forests will be discussed in another chapter.

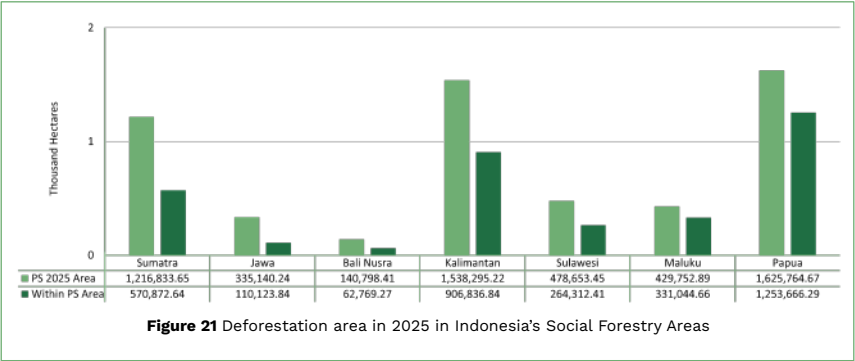
permits), followed by HKm at 1.2 million hectares (20.8%), KK covering 226,000 hectares (3.9%), and HTR covering 176 thousand hectares (3.1%); there is also an area of overlap between PS permits totaling 155 hectares. In terms of the number of SKs that have been issued, this analysis has recorded a total of 6,310 SKs , in addition to 15 PS permits that are still in the proposal process. This number represents only 57.5% of the total PS SKs released by the government (11,000 SKs).



The success of PS is often measured by environmental factors, which can be reflected in the extent to which natural forests have been preserved within their concessions. FWI data through 2025 shows that HD has the largest remaining area of natural forest, at 2.9 million hectares (70.8% of its total area). This is followed by HKm with 448 thousand hectares (37.36%), KK with 67 thousand hectares (29.91%), and HTR, which has the smallest area of natural forest at 37 thousand hectares (21.5%). Cumulatively, the total area of Natural Forest still preserved across the entire PS area is 3.49 million hectares, equivalent to 60.7% of the total PS concession area.

Meanwhile, data on deforestation within the PS concession for the 2024–2025 period shows deforestation covering an area of 39 thousand hectares. The largest area of deforestation was found within the HD area, covering 26 thousand hectares. Although this represents the largest area of deforestation, when compared to the total area of the concession, the deforestation rate is relatively low, at 0.63%. The HKm scheme experienced deforestation covering 9,766 hectares, with a deforestation rate of 0.81%. The HTR scheme recorded deforestation covering 2,654 hectares; however, given the small proportion of the HTR area, this scheme has the highest deforestation rate at 1.5%.

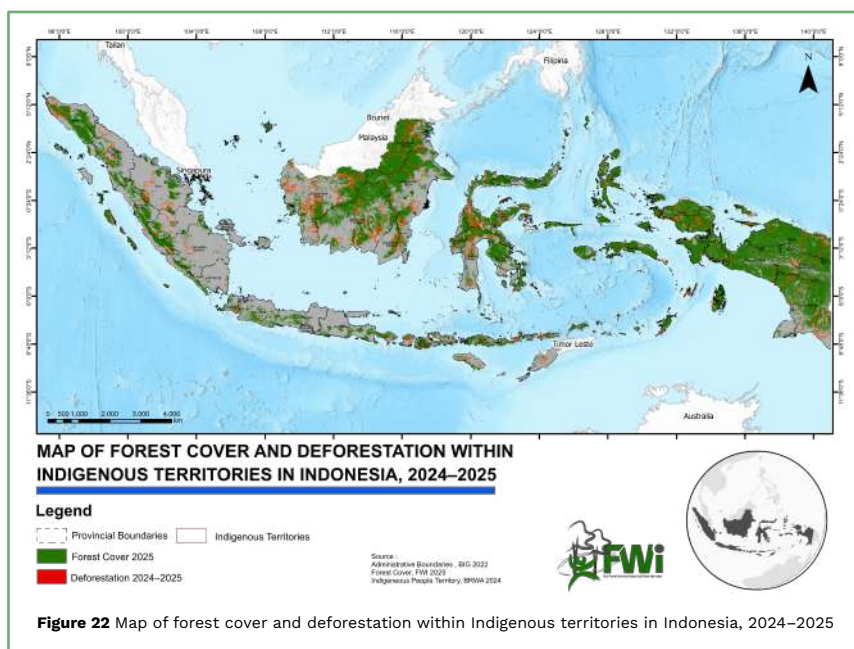
Meanwhile, the KK scheme demonstrated the best conservation performance with the smallest deforestation of 993 hectares, or a deforestation rate of 0.44%. This aligns with the characteristics of the KK scheme, which is located within a conservation area where protection regulations are stricter and the primary function is ecosystem restoration.



Based on the analysis above regarding the state of natural forest cover and deforestation occurring within the PS scheme during 2025, and when compared to the national deforestation figure for the same period (1.06 million hectares), deforestation within the PS scheme accounted for only 3.7% (39 thousand hectares) of total forest loss. When compared to land-based extractive concessions in the previous chapter, which accounted for nearly 40% of total national deforestation, this figure stands in stark contrast. This contrast reinforces the narrative that granting community management rights can curb the national rate of deforestation, even though the recognition process has been relatively slow.



Forest Conditions and Deforestation in 2024–2025 in Indigenous Territories and Forests



According to data from the Indigenous Territories Registration Agency (Badan Registrasi Wilayah Adat/BRWA) as of August 2024, Indonesia’s registered Indigenous territories cover 30 million hectares, with more than 40% of that area located in the Papua Region. FWI’s analysis shows that 18.55 million hectares, or 20% of the country’s forest cover, are located within Indigenous territories. The highest proportions of primary forest within Indigenous Territories are found in the Papua and Kalimantan regions, where 77% and 74% of the Indigenous territories, respectively, are still covered by natural forest, while the lowest

proportion is in the Sumatra region. FWI also identified 3.68 million hectares of Key Biodiversity Areas located within Indigenous territories. These findings suggest that large expanses of critical ecosystems can be sustainably managed by Indigenous communities.

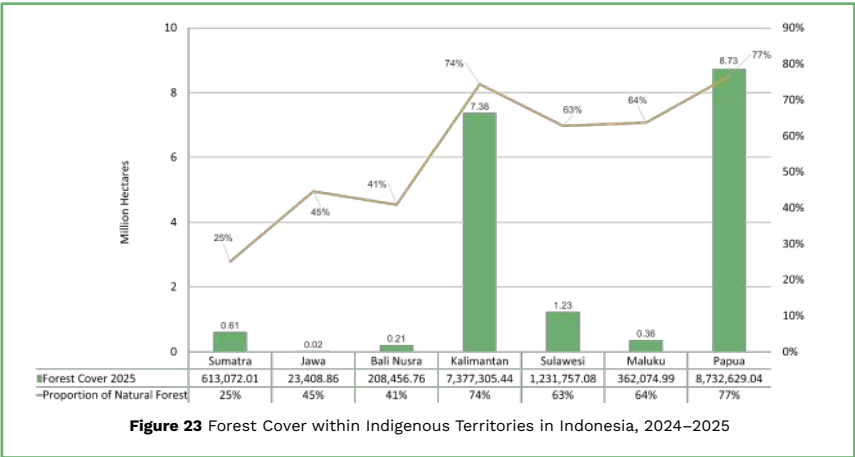


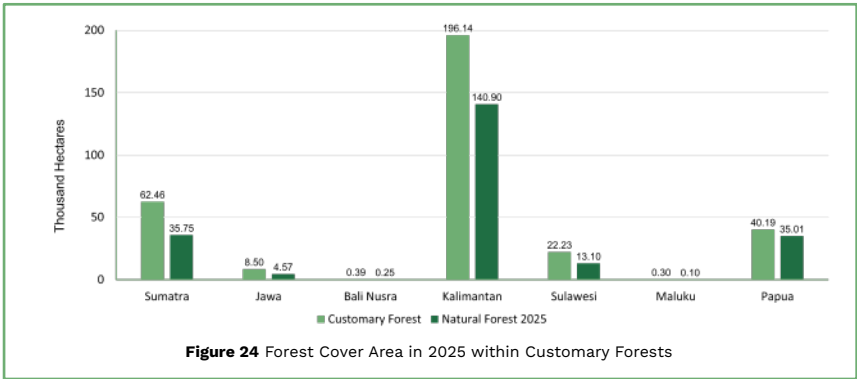
Figure 23 Forest Cover within Indigenous Territories in Indonesia, 2024–2025

Table 7 Concession Areas Within Indigenous Territories							
Region	Area of Indigenous Territory within the Concession						Total Area of Concessions Within Indigenous Territories
	Overlaps	PBPH					
		HA	HT	Others (NTFP Concessions- SILVOPASTURE- Environmental Restoration - Carbon Capture - Nature tourism)	Plantation	Mining	
Sumatra	36,268.14	82,650.42	367,573.70	39,366.60	277,737.77	46,418.04	850,014.67
Jawa	0	0	0	0	0	1,966.33	1,966.33
Bali Nusra	0	0	2,890.71	0	0	9,830.80	12,721.51
Kalimantan	448,941.06	2,024,521.85	420,867.48	170,124.10	825,929.29	110,088.29	4,000,472.07
Sulawesi	0	67,797.53	10,088.79	90.88	17,985.72	107,572.36	203,535.28
Maluku	5,846.54	71,286.17	0	0	0	38,366.08	115,498.79
Papua	134,815.71	1,074,735.41	426,932.64	99,833.26	1,119,382.92	18,268.62	2,873,968.55
Total (ha)	625,871.45	3,320,991.38	1,228,353.32	309,414.84	2,241,035.70	332,510.52	8,058,177.20

During the 2024–2025 period, the area of natural forest within Indigenous Territories decreased by 109,66 thousand hectare or approximately 10% of total national deforestation, with the largest declines occurring in the Papua Region (42,86 thousand

hectare) and Kalimantan (38,71 thousand hectare). Upon closer examination, the deforestation within these Indigenous Territories is not entirely attributable to the activities of the Indigenous Peoples living there alone. FWI's analysis shows that 8.05 million hectares of Indigenous Territories overlap with land-based concessions. The largest overlap is with PBPH-HA concessions, covering an area of 3.32 million hectares. This area of overlap with land-based concessions accounts for nearly half of the total deforestation in Indigenous Territories during 2024–2025. When examining the overlap between Indigenous Territories and land-use zones, 82% of Indigenous Territories fall within Forest Areas. Protected Forests constitute the largest portion, covering 5.91 million hectares. Meanwhile, Indigenous Territories located in APL cover 4.89 million hectares.

To provide legal certainty regarding forest management by Indigenous Peoples in their territories, specifically within Forest Areas, the government has issued a Decree (Surat Keputusan/SK) on Indigenous Forests. According to data from the Ministry of Forestry as of May 2026, 174 Indigenous Forest units have been designated, benefiting 92,955 households across an area of 368,000 hectares. This achievement is still far from the total area of registered Indigenous Territories, representing only about 1% of the total registered Indigenous Territories. The latest data compiled by FWI at the end of 2024 shows that 160 Customary Forest SKs have been issued, covering an area of 330 thousand hectares. More than half of this Customary Forest area is located in the Kalimantan region, spanning 196 thousand hectares.



The majority, or nearly 70%, of the area of designated Customary Forests remains natural forest. This natural forest decreased by only 1,800 hectares during the 2024–2025 period, representing just 0.1% of total national deforestation. The largest deforestation occurred in the Kalimantan region (862.06 hectares), Sumatra (451.09 hectares), and Sulawesi (390.92 hectares). This indicates that the customary forest designation scheme has been empirically proven to be effective as an instrument for protecting natural forest cover.

Forest Cover and Deforestation Trends in Land Management Policy Guidelines

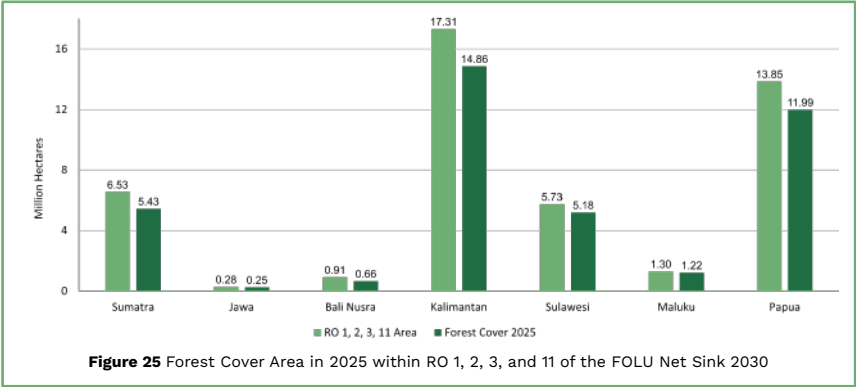
Forest Cover and Deforestation 2025, FOLU NET-SINK 2030 (RO 1,2,3,11)

As part of its climate change mitigation policies and actions toward achieving a FOLU Net Sink by 2030, Indonesia has issued twelve operational plans (Rencana Operasi/RO) that emphasize preventing or reducing the rate of forest deforestation, addressing forest degradation within concessions, establishing plantation forests on degraded land, implementing non-rotational and rotational rehabilitation, practicing sustainable forest management, and other measures (KLHK, 2020). In this study, the analysis is limited to four ROs, namely 1, 2, 3, and 11. These four ROs focus on the protection of natural forests and remaining carbon stocks, including the protection of high conservation value areas (Areal Bernilai Konservasi Tinggi/ABKT) in line with the objectives for which this study was conducted.

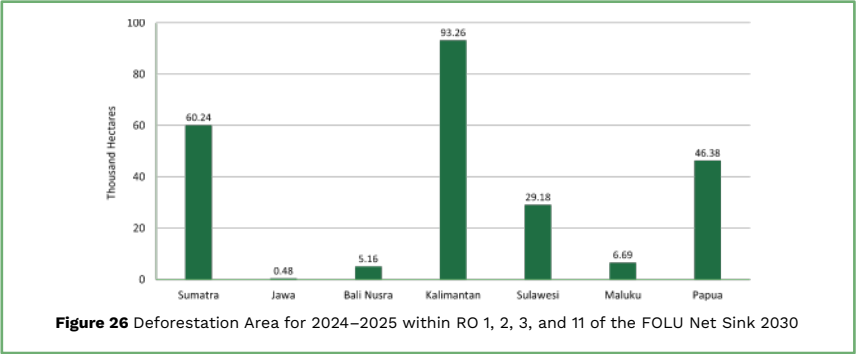
Table 8 Details of the FOLU Net Sink 2030 Operational Plan Guidelines

Mitigation Guidelines	Location Guidelines for the Operational Plan (RO)	Description of the Guidelines
Prevention/reduction of the rate of mineral land deforestation	RO 1	Prevention/reduction of planned and unplanned deforestation on mineral land
Prevention/reduction of the rate of peatland and mangrove deforestation	RO 2	Prevention/reduction of planned and unplanned deforestation on peatland and mangrove areas
Reduction of the rate of mineral land degradation	RO 3	Prevention of planned and unplanned land degradation on mineral land
Biodiversity conservation	RO 11	Prevention of deforestation of natural forests, protection of NKT areas, implementation of wildlife corridors, and optimization of highly unproductive land prone to fire

The total area of the four ROs is 45.92 million hectares, broken down as follows: RO1: 1.12 million hectares, RO2: 227.23 thousand hectares, RO3: 4.77 million hectares, RO11: 36.14 million hectares, and overlap between ROs: 3.66 million hectares. The Kalimantan and Papua regions have the four largest operational plans in terms of area. By 2025, the remaining forest area within these four ROs will be 39.58 million hectares, or 86% of the total RO area. The Maluku (94%) and Sulawesi (90%) regions have the highest proportions of natural forest relative to their total RO area, while the lowest proportion is found in the Bali-Nusa region (72%).



During the 2024–2025 period, there was significant deforestation in all four RO areas, with a total of 241.47 thousand hectares or approximately 20% of the national total. The Kalimantan and Sumatra regions recorded the highest deforestation rates, at 93.25 and 60.23 thousand hectares, respectively. This situation indicates a disconnect between national mitigation targets and on-the-ground realities, where massive deforestation in areas designated for deforestation prevention, whether on mineral land or peatland, has the potential to hinder the achievement of the 2030 FOLU Net Sink target.



Further analysis by FWI shows that 30% of the implementation areas of the four RO zones are located within land-based concessions (PBPH, plantations, and mines). This indicates that the success of the FOLU Net Sink 2030 initiative no longer relies solely on government governance but also requires compliance by these concessions in preventing deforestation. However, looking at practices on the ground, these concessions actually contributed to 42% (101,52 thousand hectares) of the deforestation that occurred within the four RO areas. The largest areas of deforestation were identified in PBPH-HA (28,25 thousand hectares) and Plantations (24,39 thousand hectares).

Forest Cover and Deforestation in 2024–2025 within the Area Subject to a Moratorium on New Permits

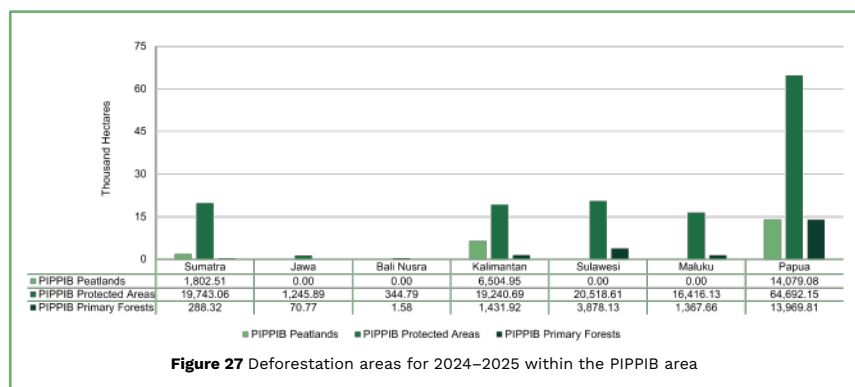
In 2011, President Susilo Bambang Yudhoyono issued Presidential Instruction No. 10 of 2011, which stipulated a moratorium on new permits (PIPPIB) in primary natural forests and peatlands. This policy was a follow-up to the Indonesia-Norway Bilateral Agreement on Reducing Emissions from Deforestation and Degradation (REDD+) and improving forest governance. This Presidential Instruction was initially a temporary suspension for 8 years, and in 2019, President Joko Widodo made the policy permanent through Presidential Instruction No. 5 of 2019. The regulatory terminology was changed from “suspension” to “cessation of” the issuance of new permits. Although the policy suspending the issuance of new permits is now permanent, the Indicative Map (PIPPIB) continues to be revised and updated periodically (generally every 6 months) by the Ministry of Forestry. These revisions are made to accommodate updates to spatial planning data, the latest field surveys of physical conditions, and court rulings (Mongabay 2019).

In this study, FWI analyzed PIPPIB data for 2024, covering a total area of 56.83 million hectares, broken down as follows: 3.6 million hectares of PIPPIB Peatlands, 43.67 million hectares of PIPPIB Protected Areas, and 9.51 million hectares of PIPPIB Primary Forests. Although the primary objective of this policy is to reduce emissions and improve forest governance by imposing a moratorium or suspension on land-based concessions, FWI found that currently 5% of the PIPPIB area is already under the control of land-based concessions. Plantations constitute the largest type of concession within the PIPPIB area, covering 1.33 million hectares, followed by PBPH (846 thousand hectares), and then mining (722 thousand hectares).

Table 9 PIPPIB Area in 2024 and Remaining Forest Area in 2025

Region	PIPPIB Area			Remaining Forests in 2025 within PIPPIB		
	Peatland	Area	Primary	Peatland	Area	Primary
Sumatra	355,152.79	4,755,083.09	70,349.78	33,001.39	3,113,165.68	59,941.88
Jawa	0.00	1,170,350.57	15,969.48	0.00	867,718.24	11,752.40
Bali Nusra	0.00	117,866.54	310.13	0.00	96,139.89	271.61
Kalimantan	1,319,055.32	11,907,520.84	1,354,134.37	494,168.51	9,316,738.70	1,283,072.42
Sulawesi	0.00	6,029,433.55	996,837.26	0.00	4,838,714.49	922,017.07
Maluku	0.00	1,791,546.00	309,167.20	0.00	1,589,862.45	280,669.74
Papua	1,967,956.62	17,907,080.01	6,765,785.81	1,461,333.24	13,140,668.06	6,066,473.94
Total (ha)	3,642,164.73	43,678,880.60	9,512,554.02	1,988,503.13	32,963,007.51	8,624,199.06

The area of natural forest within the PIPPIB area identified in 2025 is 43.67 million hectares. The highest proportion of remaining forest and the largest PIPPIB area are found in the Maluku Region, where 89% of the total PIPPIB area is still natural forest, while the Sumatra Region has the smallest proportion of natural forest, with only 62% of its total area still consisting of natural forest. When viewed from the perspective of the Primary Forest PIPPIB typology, the allocation of this area is also considered inappropriate, because out of 9.51 million hectares of the Primary Forest PIPPIB area, only 8.62 million hectares of natural forest remain within it.



FWI's analysis shows that 185,590 hectares of PIPPIB areas were deforested during 2024–2025, with 22.38 thousand hectares within Peatland PIPPIB areas, 142.20 thousand hectares within Protected Area PIPPIBs, and 21 thousand hectares within Primary Forest PIPPIBs. The most extensive deforestation occurred in the Papua Region (92,74 thousand hectares) and the Kalimantan Region (27,17 thousand hectares). This indicates that despite the regulations being permanent, the PIPPIB has failed to prevent deforestation in

Indonesia. This is consistent with a study conducted by Groom et al. (2022), which found that PIPPIB areas only succeeded in reducing forest loss within their boundaries by 0.65% compared to areas outside the PIPPIB.

Forest Cover and Deforestation, 2024–2025, in Areas Designated for Forest and Land Rehabilitation

Government Regulation No. 26 of 2020 defines Forest and Land Rehabilitation (Rehabilitasi Hutan dan Lahan/RHL) as efforts to restore, maintain, and enhance the functions of forests and land in order to improve their carrying capacity, productivity, and role in sustaining life-supporting systems. RHL planning is based on the carrying capacity status of watersheds, with parameters including land criticality, water quality and quantity, and socioeconomic factors. Based on this watershed classification, the government develops a tiered planning framework: ranging from long-term (macro) RHL plans, to medium-term (5-year) plans, and short-term plans.

At COP 29 in 2024 in Baku, Hashim Djojohadikusumo, as Head of the Indonesian Delegation, announced a highly ambitious target that Indonesia will rehabilitate 12.7 million hectares of critical land within Protected Forest Areas and Conservation Areas to meet its NDC targets and also as a mitigation measure against the impacts of the food estate initiative. This target far exceeds the average RHL achievements in previous years. In this study, FWI attempts to identify these 12.7 million hectares by examining critical lands in Indonesia classified as “Critical” and “Very Critical.”

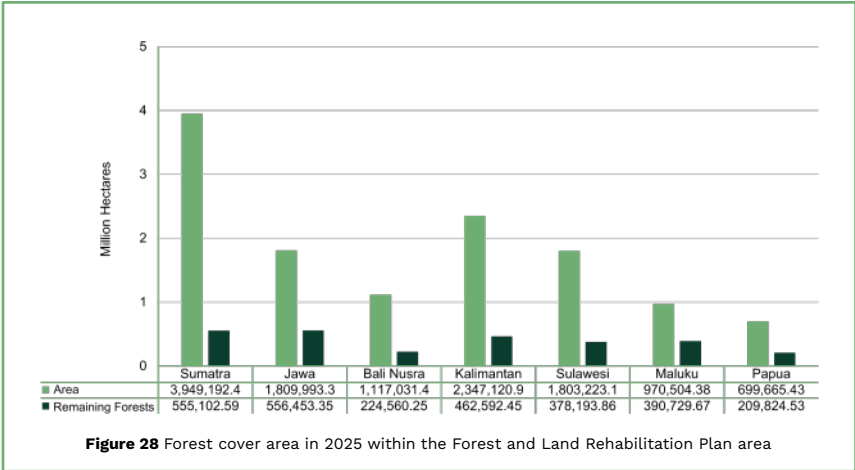


Table 10 Area of Critical Land in Indonesia

Region	Area	Deforestation 2024-2025	Remaining Forests in 2025
Sumatra	3,949,192.41	34,524.30	555,102.59
Jawa	1,809,993.32	4,936.53	556,453.35
Bali Nusra	1,117,031.47	6,535.90	224,560.25
Kalimantan	2,347,120.98	14,844.20	462,592.45
Sulawesi	1,803,223.10	13,094.15	378,193.86
Maluku	970,504.38	20,293.36	390,729.67
Papua	699,665.43	4,347.73	209,824.53
Total (ha)	12,696,731.09	98,576.17	2,777,456.70

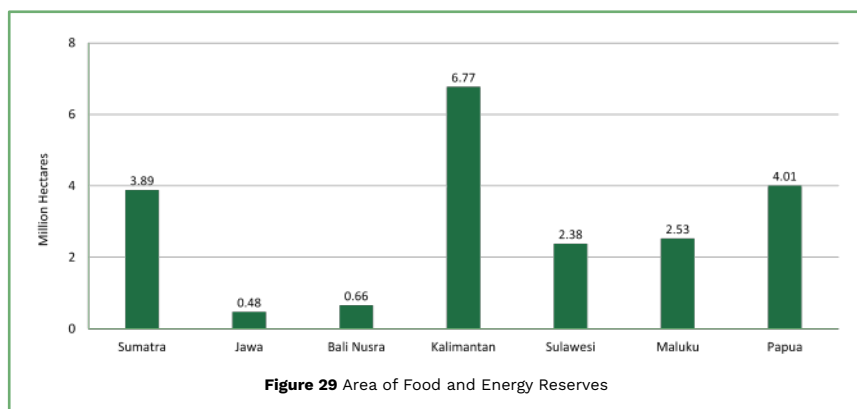
In terms of distribution, the planned RHL areas are largely concentrated in the Sumatra and Kalimantan regions, covering 3.9 million hectares and 2.34 million hectares, respectively. This aligns with the analysis in Chapter 1, which noted that the Kalimantan and Sumatra regions are the two regions with the highest levels of forest degradation, not only during the 2024–2025 period but also in previous years. In contrast, the Papua region, where 74% of the land is still covered by natural forest and the rate of deforestation is relatively stable, requires only 699,660 hectares for the RHL plan.

The RHL plan is already aligned with efforts to protect remaining natural forests. This is supported by FWI's analysis, which shows that by 2025, only about 21% or 2.77 million hectares of natural forest will remain within that area. However, FWI also found that significant deforestation is still occurring within the RHL plan, even though the land status is already classified as critical and very critical; specifically, 98.57 thousand hectares of forest have been deforested. The largest deforestation occurred in the Sumatra region (34.52 thousand hectares) and Maluku (20.29 thousand hectares).

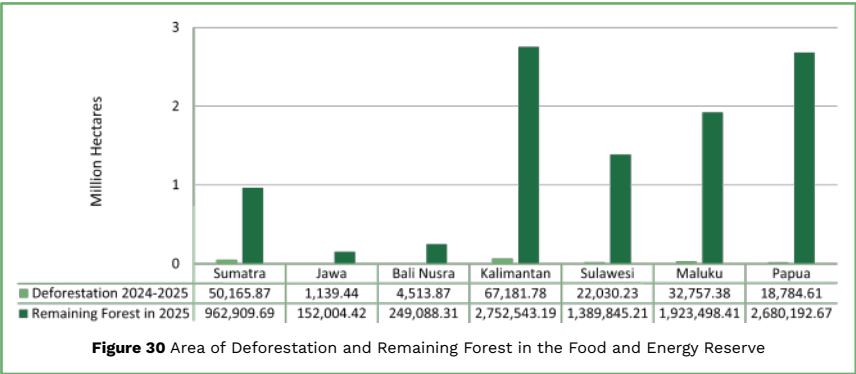
When viewed from the perspective of watersheds with low forest cover ratios (Chapter 2), the planned RHL areas in some watersheds are already aligned. This is evident in the Citarum and Noel-Mina watersheds, where the proportion of remaining forest within the watersheds is less than 30%, and the planned RHL areas are 20% and 23% of the total watershed area, respectively. However, in some cases, there are watersheds with extremely low forest cover ratios, such as Serang (3%) and Rokan (13%), yet their RHL area plans are already low at 5% and 8% of the total watershed area, respectively.

Forest Cover and Deforestation in 2024–2025 within Food and Energy Reserve Areas

The proposal to set aside 20 million hectares of forest area for food and energy was first announced by President Prabowo at the beginning of his term. This was in response to a national logistics crisis caused by geopolitical issues affecting food and energy supplies. This directive was subsequently acted upon by Minister of Forestry Raja Juli Antoni in early January 2026 with the issuance of Minister of Forestry Regulation No. 8 of 2026 (National Forestry Plan/Rencana Kehutanan Tingkat Nasional/RTKN), which, in terms of spatial planning, divides the 20.6 million-hectare area into two management schemes: Land Sparing (approximately 16.35 million hectares strictly managed by corporations or the state) and Land Sharing (approximately 4.27 million hectares designated for collaborative use through social forestry schemes).



The majority of these Food and Energy Reserve areas are located in Kalimantan and Papua, covering a total area of 10.8 million hectares. However, a statement from the Ministry of Forestry acknowledges that the land cover in these areas is dominated by scrub, open land, and secondary forest. FWI's analysis indicates that by 2025, nearly half or 10.1 million hectares of this Food and Energy Reserve area remains natural forest. In the Papua region, 67% (2.68 million hectares) of the Food and Energy Reserve area remains natural forest, as is the case in Maluku, where the proportion of natural forest is even higher at 76% (1.92 million hectares).



Throughout 2024–2025, activities within the Food and Energy Reserve area have resulted in the deforestation of 196.57 thousand hectares of natural forest. The most extensive deforestation occurred in the Kalimantan Region (67.18 thousand hectares), Sumatra (50.16 thousand hectares), Maluku (32.75 thousand hectares), and Papua (18.78 thousand hectares), while the least deforestation was recorded in the Java and Bali-Nusa Regions. These Food and Energy Reserve Areas are far from being “Clean and Clear,” as 6.9 million hectares of these areas overlap with land-based concessions, comprising 3.8 million hectares of PBPH, 1.2 million hectares of plantations, 729 thousand hectares of mining areas, and 1.1 million hectares of overlap between concessions.

In this study, FWI also examined one of the Food Estate projects in Merauke District as part of the Food and Energy Reserve area implementation. The analyzed area of the Merauke Food Estate spans 2.3 million hectares, of which 34.5% of the total area remains natural forest as of 2025. Additionally, between 2024 and 2025, deforestation covering 17.9 thousand hectares was recorded within this area.

In addition to threatening Natural Forest, the Merauke Food Estate also endangers 11 thousand hectares of peatland as well as the livelihoods of 159 Indigenous Territories spanning 1.56 million hectares. A compilation of media reports by FWI (2025) indicates an escalation of conflicts in four major districts in Merauke due to the Food Estate. These conflicts are primarily caused by the manipulation of clans due to the incomplete implementation of FPIC, inadequate compensation, and the destruction of sacred sites

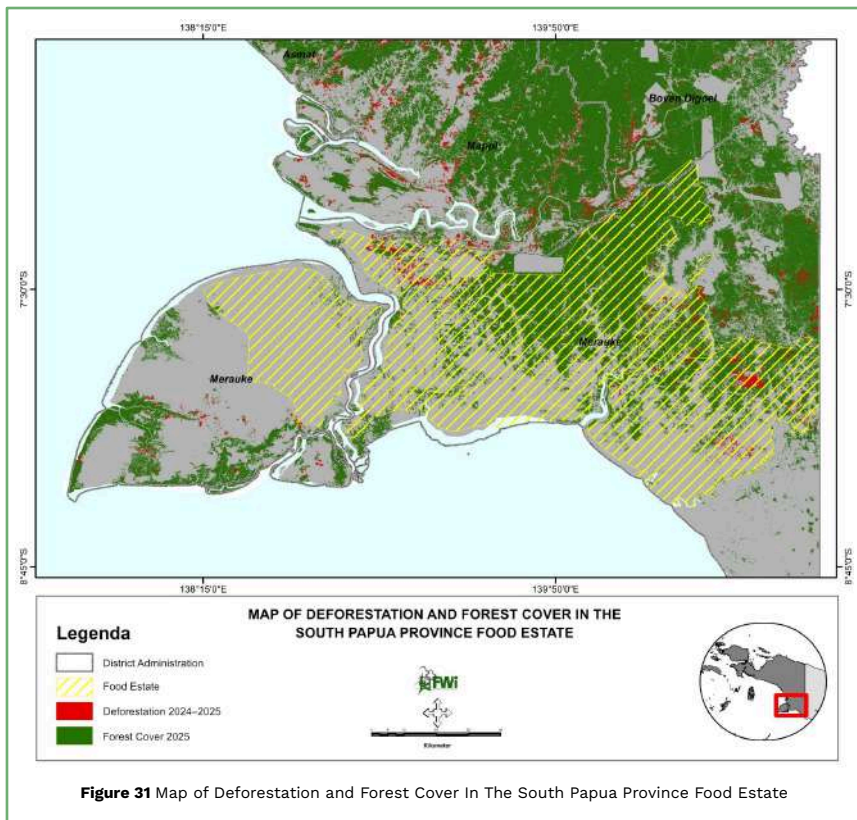


Table 11 Area of Functional Zones within the Food Estate

Area Function	Area (Hectares)
Water Bodies	168.98
Protected Forests	3,823.57
Production Forests	2,069,436.39
Conservation Areas	0.00
Areas for Other Uses	239,168.74
Total	2,069,436,39

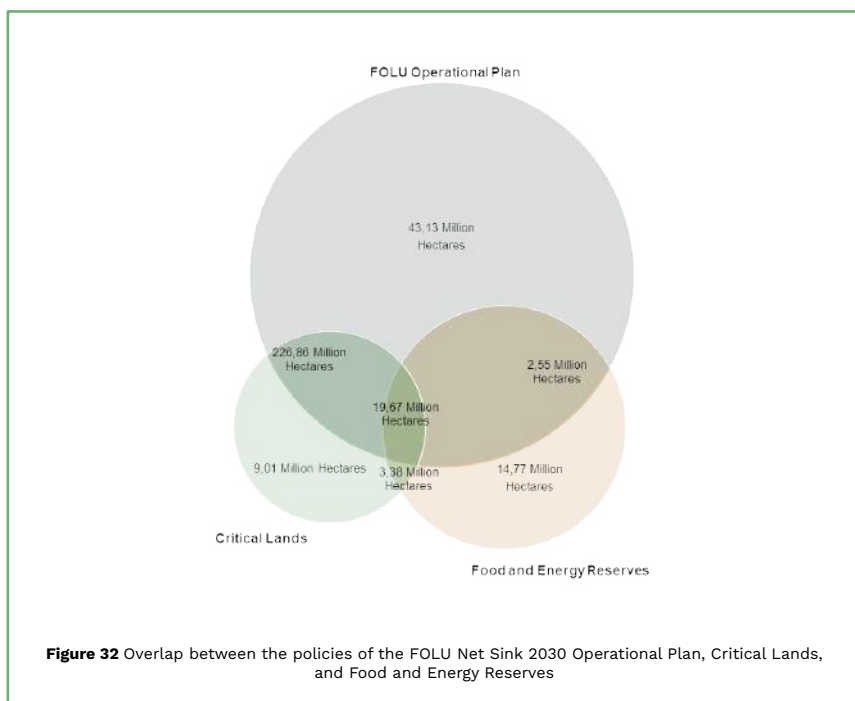
Table 12 Area of the Regional Spatial Plan (RTRWP) Within the Food Estate

RTRWP	Food Estate Area
Limited Production Forests	209,158.10
Permanent Production Forests	741,153.70
Convertible Production Forests	20,327.30
Peatland Areas	50,233.12
Protected Forest Areas	3,832.29
Geological Conservation Areas	283,786.00
Mangrove-Forested Coastal Areas	2,082.26
Plantation Areas	40,863.26
Settlement Areas	95,218.59
Nature Reserves, Nature Conservation Areas, and Cultural Heritage Sites	906.96
Wetland Food Agriculture	473,967.41
Dryland Food Agriculture	228,440.84
Conservation Swamps	58,028.27
Coastal Buffer Zones	8.32
River Buffer Zones	8,595.64
National Parks and Marine National Parks	95,898.28
Total	2,312,500.34

Based on the designation of forest areas, the majority (89%) of the Merauke Food Estate is located within Production Forest Areas, which is also consistent with the Merauke Provincial Spatial Plan (RTRWP). However, according to the RTRWP, 442.45 thousand hectares of the Food Estate area are also classified as Protected Areas (Protected Forest Areas, Geological Protection Areas, KSA/KPA, Conservation Swamps, and National Parks). FWI also found that 75% (1.7 million hectares) of the Merauke Food Estate area overlaps with other land-based concessions, comprising 1 million hectares of plantations, 570,000 hectares of PBPH, and 164,000 hectares of overlap between PBPH and plantations.

Dynamics of Land and Forest Governance Policies

Efforts to improve forest and land governance in Indonesia, both now and in the future, continue to face unavoidable structural challenges. One of the causes is a lack of alignment among policies. Instead of operating within an integrated spatial planning roadmap, several management policies contradict one another. Climate change mitigation policies through the FOLU Net Sink 2030 initiative and land rehabilitation plans clash with expansive efforts to ensure food and energy security.



FWI's 2026 analysis shows that the area covered by the FOLU Operational Plan (Rencana Operasional/RENOPS), specifically RO 1, RO 2, RO 3, and RO 11, with a total area of 45.92 million hectares, overlaps by 2.55 million hectares with the food and energy reserve plan. The policy to restore 12.7 million hectares of critical land also overlaps by 3.38 million hectares with the food and energy area plans. On the other hand, policies that should be aligned, namely the RENOPS FOLU Net Sink and the land rehabilitation plan, overlap by only 226.86 thousand hectares. These millions of hectares of overlapping areas not only indicate policy inconsistencies and the absence of a roadmap for forest management in Indonesia, but also, looking further ahead, point to potential leakage from emission reduction commitments, with grassroots communities bearing the brunt of the impact.

Conclusion

Overall, this study shows that Indonesia's natural forests continue to face pressure, both in terms of shrinking area and deteriorating ecological conditions, despite the existence of numerous policies intended to protect them. One striking finding is a 37% surge in the national deforestation rate during the 2024–2025 period compared to the previous year, with Kalimantan and Sumatra being the regions that have lost the most forest area and also experienced the most “fragmentation” of their forests. This indicates that the problem is not merely one of shrinking forest area, but also that the remaining forests are finding it increasingly difficult to function effectively as intact ecosystems.

Meanwhile, Papua remains the region with the most intact natural forests in Indonesia; more than 80% of its forests are still in good condition. However, this study also identified warning signs: deforestation pressure in Papua is beginning to increase, particularly in areas already burdened by business permits and in areas that should be protected from new permits (PIPPIB). This means that Indonesia's last remaining forest stronghold is becoming increasingly vulnerable as land-clearing activities expand.

Another equally important finding concerns who is actually doing the most to protect the forests. Data shows that land-based concessions such as plantation permits, mining permits, and forest-use permits are responsible for nearly 40% of all national deforestation. Compare this to areas directly managed by communities: the Social Forestry scheme accounts for only 3.7% of total forest loss, while Customary Forests account for even less than 1%. This means that forests managed by communities are actually far better preserved than those handed over to corporations through business permits.

This evidence becomes even stronger when examining what happens when Indigenous territories are burdened by corporate concessions. FWI's analysis shows that approximately 45% of deforestation occurring in Indigenous Territories takes place in areas that overlap with land-based concessions. This indicates that the presence of concessions is a key factor contributing to pressure on forests in Indigenous Territories. These findings suggest that the increase in deforestation is more closely linked to the introduction of land-based concessions than to management activities carried out by Indigenous Peoples. These findings serve as important considerations for the government

in formulating future policies, particularly to accelerate and expand the recognition of Indigenous Peoples' management rights over forests.

On the other hand, this study also found that various long-standing policies designed to protect forests, such as the PIPPIB (Peta Indikatif Penghentian Pemberian Izin Baru/ Indicative Map for the Suspension of New Permits), the FOLU Net Sink Operational Plan 2030, and the critical land rehabilitation plan, have not yet succeeded in preventing deforestation in the very areas they are supposed to protect. The problem is not only weak policies but also that these policies overlap with one another and even conflict with expansion plans for the Food and Energy Reserve. As a result, forest protection efforts that should reinforce one another are instead experiencing “leaks” in implementation, making it increasingly difficult for Indonesia to achieve its 2030 target of balancing carbon emissions from the forest and land sectors (FOLU Net Sink).

More importantly, this issue is not new. If we trace the history from 1985 to 2025, the pattern is consistently repeated: every change in government tends to create loopholes in the regulations to accommodate economic development and large-scale national projects. In other words, the current policy overlaps are not merely technical errors that can be quickly corrected, but rather part of an old pattern that continues to repeat itself from one regime to the next.

Similar pressures are also found in ecosystems of significant ecological and social value, including Key Biodiversity Areas, habitats of flagship species, peatland ecosystems, small islands, and critical watersheds, which continue to experience deforestation despite their status as areas of high conservation value. Some of these areas have even been burdened with concession permits, meaning that their administratively designated protected status has not yet been accompanied by adequate governance enforcement at the field level. The expansion of new policies, particularly the 20-million-hectare Food and Energy Reserve plan and its implementation through the Food Estate project in Merauke, has the potential to increase pressure on remaining natural forests, Indigenous territories, and peatlands, while also risking an escalation of social conflicts with local Indigenous Peoples, as identified in this study.

Overall, these findings point to one central conclusion: the root cause of deforestation in Indonesia is not merely a lack of regulations, but rather implementation failures, institutional fragmentation, spatial overlaps between policies, and a lack of data transparency that limits the effectiveness of public oversight. As long as these policy overlaps remain unresolved through an integrated spatial planning roadmap, achieving strategic targets such as the FOLU Net Sink 2030 and the rehabilitation of critical lands risks remaining elusive, while indigenous communities and critical ecosystems at the local level continue to bear the brunt of the impacts. Strengthening the openness of forestry

information is therefore not merely an agenda for administrative transparency, but an epistemological prerequisite for improving forest governance itself.

References

- Aulia, O. D., Apriani, I., Juanda, A., Barri, M. F., Dewi, R. W., Muharam, F. N., Oktanine, B., Phoa, T. B., & Condro, A. A. (2023). Refining national forest cover data based on fusion optical satellite imageries in Indonesia. *International Journal of Forestry Research*, 2023, 1–11. <https://doi.org/10.1155/2023/7970664>
- Cole, L. E. S., Bhagwat, S. A., & Willis, K. J. (2015). Long-term disturbance dynamics and resilience of tropical peat swamp forests. *Journal of Ecology*, 103(1), 16–30. <https://doi.org/10.1111/1365-2745.12329>
- Groom, B., Palmer, C., & Sileci, L. (2022). Carbon emissions reductions from Indonesia's moratorium on forest concessions are cost-effective yet contribute little to Paris pledges. *Proceedings of the National Academy of Sciences of the United States of America*, 119(5). <https://doi.org/10.1073/pnas.2102613119>
- International Union for Conservation of Nature. (2016). *A Global Standard for the Identification of Key Biodiversity Areas* (Version 1.0).
- Kementerian Kehutanan. (2026). *Peraturan Menteri Kehutanan Nomor 8 Tahun 2026 tentang Rencana Kehutanan Tingkat Nasional 2011-2030*.
- Kementerian Lingkungan Hidup dan Kehutanan. (2019). *Peraturan Direktur Jenderal Pengendalian Pencemaran dan Kerusakan Lingkungan Nomor 1 tahun 2019 tentang Pedoman Pelaksanaan Peraturan Menteri Lingkungan Hidup dan Kehutanan Nomor 14 tahun 2017 tentang Tata Cara Inventarisasi dan Penetapan Fungsi Ekosistem Gambut*.
- Kementerian Kehutanan dan Lingkungan. (2022). *Rencana Operational Indonesia's FOLU Net Sink 2030*.
- Kementerian Lingkungan Hidup dan Kehutanan. (2021). *Peraturan Menteri Lingkungan Hidup dan Kehutanan Nomor 7 Tahun 2021 tentang Perencanaan Kehutanan, Perubahan Peruntukan dan Fungsi Kawasan Hutan, serta Penggunaan Kawasan Hutan*.
- Lang, N., Jetz, W., Schindler, K., & Wegner, J. D. (2023). A high-resolution canopy height model of the Earth. *Nature Ecology & Evolution*, 7(11), 1778–1789. <https://doi.org/10.1038/s41559-023-02206-6>
- Mahkamah Konstitusi. (2024). Ahli: Kegiatan Pertambangan di Pulau-Pulau Kecil Menimbulkan Ancaman Serius. <https://www.mkri.id/berita/-19985>

- Moncada, S., & Nguyen, L. (2024). Improving sustainability, climate resilience and pandemic preparedness in small islands: a systematic literature review. *Sustainability*, 16(2), 550. <https://doi.org/10.3390/su16020550>.
- Nugraha, I., & Saturi, S. (2019). Presiden Teken Inpres Setop Izin di Hutan Primer dan Gambut, Masih ada Revisi Berkala?. *Mongabay Indonesia*. <https://mongabay.co.id/2019/08/09/presiden-teken-inpres-setop-izin-di-hutan-primer-dan-gambut-masih-ada-revisi-berkala/>
- Pemerintah Republik Indonesia. (2020). *Peraturan Pemerintah Republik Indonesia Nomor 26 Tahun 2020 tentang Rehabilitasi dan Reklamasi Hutan*.
- Pemerintah Republik Indonesia. (2012). *Peraturan Pemerintah Republik Indonesia Nomor 37 Tahun 2012 tentang Pengelolaan Daerah Aliran Sungai*.
- Potapov, P., Tyukavina, A., Turubanova, S., Hansen, M.C., Giglio, L., Hernandez-Serna, A., Lima, A., Harris, N., Stolle, F., 2025. Unprecedentedly high global forest disturbance due to fire in 2023 and 2024. *Proceedings of the National Academy of Sciences* 122, e2505418122. <https://doi.org/10.1073/pnas.2505418122>.
- Potapov, P., Hansen, M.C., Laestadius, L., Turubanova, S., Yaroshenko, A., Thies, C., Smith, W., Zhuravleva, I., Komarova, A., Minnemeyer, S., Esipova, E. (2017). The last frontiers of wilderness: Tracking loss of intact forest landscapes from 2000 to 2013. *Sciences Advances* 3, e1600821.
- Republik Indonesia. (2014). Undang-Undang Republik Indonesia Nomor 1 Tahun 2014 tentang Perubahan atas Undang-Undang Nomor 27 Tahun 2007 tentang Pengelolaan Wilayah Pesisir dan Pulau-Pulau Kecil. Lembaran Negara Republik Indonesia Tahun 2014 Nomor 7.
- Republik Indonesia. (2023). Undang-Undang Republik Indonesia Nomor 6 Tahun 2023 tentang Penetapan Peraturan Pemerintah Pengganti Undang-Undang Nomor 2 Tahun 2022 tentang Cipta Kerja Menjadi Undang-Undang. Lembaran Negara Republik Indonesia Tahun 2023 Nomor 41.
- Ritters, K. H., Wickham, J. D., O'Neill, R. v., Jones, K. B., Smith, E. R., Coulston, J. W., Wade, T. G., & Smith, J. H. (2002). Fragmentation of continental United States forests. *Ecosystems*, 5(8), 815–822. <https://doi.org/10.1007/s10021-002-0209-2>
- Samsuri, S., Sitorus, F., Anita Zaitunah, A., & Ahmad, A. G. (2021). Fragmentation Typology of Sumatran Tropical Lowland Forest, Labuhanbatu Selatan - Indonesia. *Indonesian Journal of Environmental Management and Sustainability*, 5(3). <https://doi.org/10.26554/ijems.2021.5.3.105-112>
- Tarigan, S., Wiegand, K., & Slamet, B. (2018). Minimum forest cover required for sustainable water flow regulation of a watershed: a case study in Jambi Province, Indonesia. *Hydrology and Earth System Sciences*, 22(1), 581–594. <https://doi.org/10.5194/hess-22-581-2018>

- Republik Indonesia. (2014). Undang-Undang Nomor 1 Tahun 2014 tentang Perubahan atas Undang-Undang Nomor 27 Tahun 2007 tentang Pengelolaan Wilayah Pesisir dan Pulau-Pulau Kecil.
- Republik Indonesia. (2023). Undang-Undang Nomor 6 Tahun 2023 tentang Penetapan Peraturan Pemerintah Pengganti Undang-Undang Nomor 2 Tahun 2022 tentang Cipta Kerja Menjadi Undang-Undang.



Forest Watch Indonesia

Jl. Sempur Kaler No. 62 Bogor,
West Java, 16129, Indonesia

+62 251 8333 308

Email: fwibogor@fwi.or.id