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A. Environmental Overview of PT ANTAM Tbk. Gold Mining Business Unit Geographical Location and Area

PT ANTAM Tbk. Gold Mining Business Unit Located in Bantar Karet Village, Nanggung District, Bogor Regency, West Java Province. Geographically it is located at coordinates 106O 30' 1.0" - 106O 35' 38.0" East Longitude and 02° 6O 36' 37.2" - 6O 43' 11.0" South Latitude with an altitude of 400 – 1800 M.dpl.PT ANTAM Tbk. Gold Mining Business Unit has a Mining Concession (KP) Exploitation area of KW 98 PP 0138 of 6,047 ha. Accessibility to the locationPT ANTAM Tbk. Gold Mining Business Unit Can be reached with a distance of ± 54 KM. The travel route from Bogor uses four-wheeled or two-wheeled vehicles via land. Below is a location mapPT ANTAM Tbk. Gold Mining Business Unit.

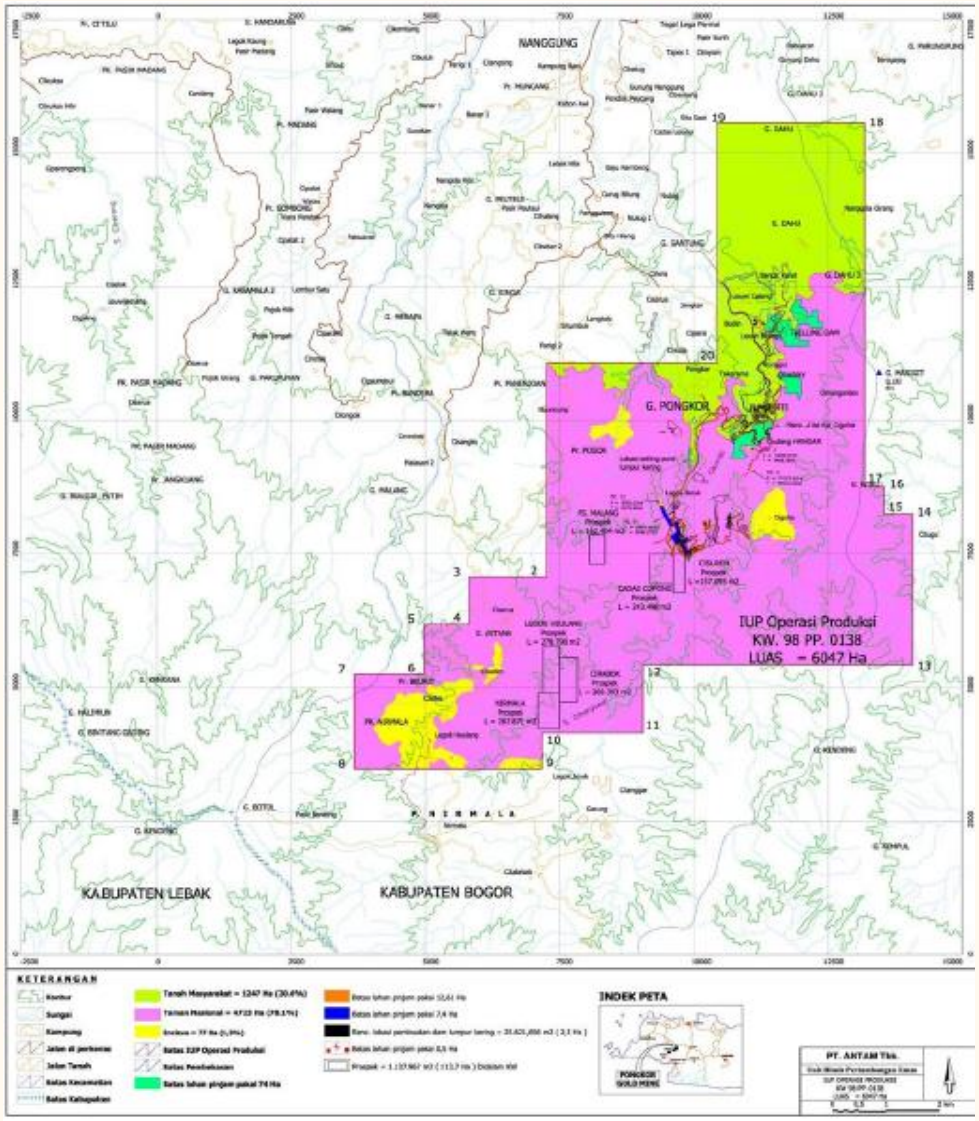


Figure 1. Location mapPT ANTAM Tbk. Gold Mining Business Unit

The Gold Mining Business Unit is one of the business units of PT ANTAM Tbk. which manages underground gold mining & processing in Bogor Regency, West Java. PT ANTAM Tbk. is part of the BUMN Mining Industry Holding.

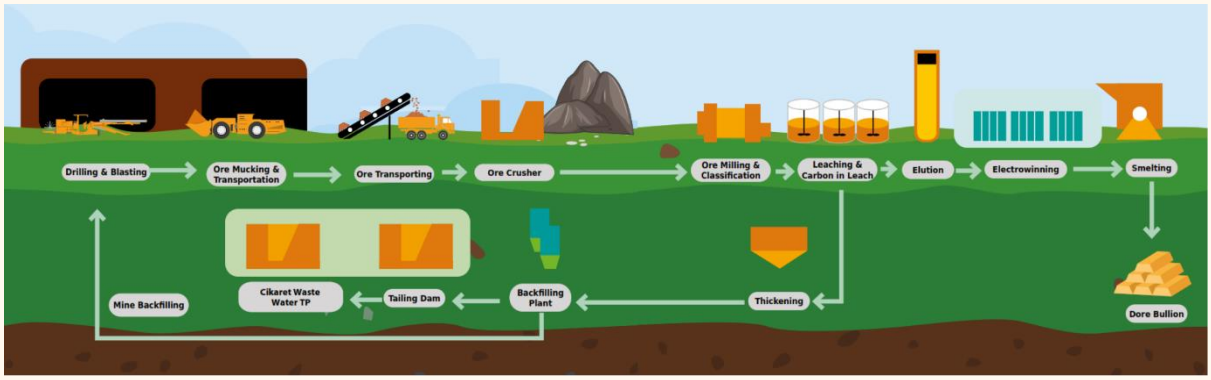


Figure 2. Production process PT ANTAM Tbk. Gold Mining Business Unit

Underground gold ore mining is carried out using the cut-and-fill method mechanically with equipment jumbo drill and load haul dump (LHD). The gold ore processing plant uses the method leaching (leaching). In the initial stage, the gold ore that has been mined will be crushed using an ore crusher and fed in a ball mill for advanced size refinement processes. Reagents are then added to the fine ore leaching in the form of cyanide to producefines slurry which will be fed into the circuit leaching. Then the leaching tank is filled with activated carbon which will progressively absorb the gold and silver metal contained within fines slurry. The metal absorbed by carbon is then recovered through an elution process with the AARL system (Anglo American Research Laboratory) which will produce a rich solution (eluate) which has a high gold and silver content. The eluate will then flow to the circuit electrowinning where gold and silver will be deposited on the cathode stainless steel. The cathode will then be washed and dried and then melted into bullion.

B. Overview of the PT ANTAM Tbk Biodiversity Conservation Area. Gold Mining Business Unit

Biodiversity in an area is an indicator of the success of a region in maintaining the balance and sustainability of an ecosystem. Efforts to preserve biodiversity are continuously carried out through both regulatory measures and intensive monitoring. The legal status of areas such as national parks, nature reserves, and business operations within forest areas

are also constantly monitored as a measure of good performance in protecting biodiversity. Biodiversity conservation efforts encompass protection, preservation, and sustainable use of an area, which can be carried out in tandem. Area protection can be achieved through patrolling and safeguarding protected species. Preservation can be done through the cultivation of plant species and the breeding of animals, while the sustainable use of an area can be pursued through exploration of its potential resources.

This serves as evidence of PT ANTAM, Tbk. – Gold Mining Business Unit (UBP)'s commitment as a state-owned enterprise engaged in underground gold mining, with its Mining Business Permit Area located within the Mount Halimun Salak National Park (TNGHS). Efforts to restore and rehabilitate the forest ecosystem, as part of PT ANTAM's responsibility in utilizing the area, continue to be undertaken. These include replanting local plant species, establishing the Biodiversity Conservation Center (PKKH), and the Center for Tree and Native Plant Research and Education (P4TA) in collaboration with Mount Halimun Salak National Park (TNGHS). Therefore, the preservation of biodiversity is crucial in the context of sustaining conservation efforts for the flora and fauna of Mount Halimun Salak National Park, including the Mining Business Permit Area of PT ANTAM, Tbk. – Gold Mining Business Unit (UBP) within it.

PT ANTAM Tbk. Gold Mining Business Unit primarily conducts conservation programs within the Gunung Halimun Salak National Park (TNGHS) area. Below are the key characteristics of the Gunung Halimun Salak National Park (TNGHS) area.

C. SUCCESS OF BIODIVERSITY PROTECTION PROGRAMS PT ANTAM TBK. GOLD MINING BUSINESS UNIT

1. DATA STATUS

The following is the data on the biodiversity protection status of PT. ANTAM UBP Emas from 2020 to 2024 (as of June)

*Table 1. Flora Biodiversity Status of PT. ANTAM UBPE for the Years 2020 – 2024**

No	Species Name	Number of Individuals (Stems)				
		2020	2021	2022	2023	2024*
1	Rasamala	33.000	48.000	58.000	70.000	70.000
2	Puspa	30.000	43.000	50.000	60.000	60.000
3	Huru	10.000	22.000	29.000	40.000	40.000
4	Ganitri	3.500	3.500	10.500	10.500	12.500
5	Kisireum			2.400	2.400	2.400
6	Hamerang			1.500	1.500	1.500
7	Kondang			1.400	1.400	1.400
8	Darangdan			700	700	700
9	Mara			500	500	500
10	Caringin			500	500	500
11	Kiputri	3.500	3.500	3.500	3.500	3.500
12	Salam		10.000	10.000	15.000	15.000
13	Bayur	10.000	10.000	10.000	10.000	10.000
14	Pasang	20.000	20.000	20.000	20.000	20.000
15	Kiriung anak	6.500	6.500	6.500	6.500	6.500
16	Kimerak	3.500	3.500	3.500	3.500	3.500
17	Palahlar				160	200
18	Gamelina					1.250
19	Mahoni					2.000
20	Trembesi					1.000
21	Sengon Buto					2.000
Total		120.000	170.000	208.000	246.160	254.450

*Table 2. Fauna Biodiversity Status of PT. ANTAM UBPE for the Years 2020 – 2024**

No	Species Name	Number of Indiviuals (head)				
		2020	2021	2022	2023	2024*
1	Bido snake eagle (Spilornis cheela)	10	12	15	21	28
2	Owa Jawa (Hylobates Moloch)	10	12	18	18	25
3	Javanese eagle (Nisaetus bartelsi)	10	12	14	15	24
Total		30	36	47	54	77

2. DATA ABSOLUTE

The following is absolute data on PT ANTAM Tbk's biodiversity protection program. Gold Mining Business Unit from 2020-2024 (June)

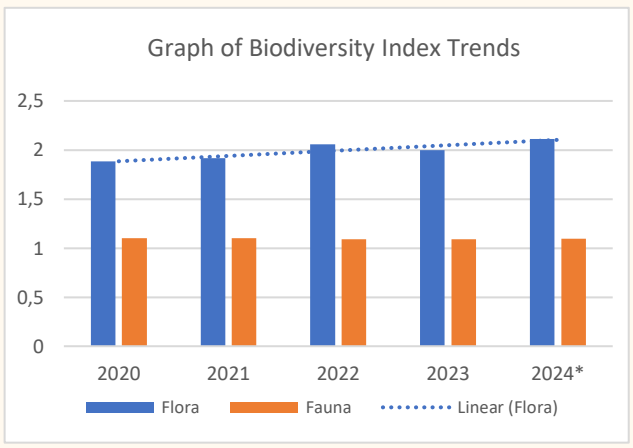
*Table 3. Absolute Results of Biodiversity at PT. ANTAM UBPE for the Years 2020 – 2024**

No	Program	Type of Species / Area	Absolutly Results										Satuan
			2020		2021		2022		2023		2024*		
			Absolutely	Anggaran (Rp)	Absolutely	Budget (Rp)	Absolutely	Budget (Rp)	Absolutely	Budget (Rp)	Absolutely	Budget (Rp)	
1	Restoration of the Mount Halimun Salak National Park Ecosystem in Protected Forest Areas	Area	120	280.200.000	150	235.500.000	220	194.000.000	220	114.000.000	220	70.000.000	Ha
		Rasamala	33.000		48.000		58.000		70.000		70.000		stems
		Puspa	30.000		43.000		50.000		60.000		60.000		stems
		Huru	10.000		22.000		29.000		40.000		40.000		stems
		Ganitri	3.500		3.500		10.500		10.500		12.500		stems
		Kisireum					2.400		2.400		2.400		stems
		Hamerang					1.500		1.500		1.500		stems
		Kondang					1.400		1.400		1.400		stems
		Darangdan					700		700		700		stems
		Mara					500		500		500		stems
		Caringin					500		500		500		stems
		Kiputri	3.500		3.500		3.500		3.500		3.500		stems
		Salam			10.000		10.000		15.000		15.000		stems
		Bayur	10.000		10.000		10.000		10.000		10.000		stems
		Pasang	20.000		20.000		20.000		20.000		20.000		stems
		Kiriung anak	6.500		6.500		6.500		6.500		6.500		stems
		Kimerak	3.500		3.500		3.500		3.500		3.500		stems
		Gamelina									1.250		stems
		Mahoni									2.000		stems
		Trembesi									1.000		stems
		Sengon Buto									2.000		stems
		Indeks	1,88		1,92		2,06		2,00		2,11		H'
2	Conservation of Native Wildlife – Release and Monitoring of Key Fauna in the Antam Pongkor IUP Area and Gunung Halimun Salak National Park	Bido Snake Eagle (Spilornis cheela)	10	12.000.000	12	36.000.000	15	156.000.000	21	90.000.000	21	68.000.000	head
		Owa Jawa (Hylobates Moloch)	10		12		18		18		18		head
		Javanese Eagle (Nisaetus bartered)	10		12		14		15		15		head
		Indeks	1,10		1,10		1,09		1,09		1,09		H'
3	Empowering Conservation Village Partner Communities through Local Plant Cultivation & Nursery Collaboration (Silviculture Trees Species Local) Mount Halimun Salak National Park Area (TNGHS)	Rasamala	15.000	182.000.000	15.000	389.000.000	10.000	249.000.000	12.000	158.000.000		160.242.347	stems
		Puspa	15.000		13.000		7.000		10.000				stems
		Huru	10.000		12.000		7.000		11.000				stems
		Ganitri					7.000				2.000		stems
		Kisireum					2.400						stems
		Hamerang					1.500						stems
		Kondang					1.400						stems
		Darangdan					700						stems
		Mara					500						stems
		Caringin					500						stems
		Kiputri	3.500										stems
		Salam			10.000				5.000				stems
		Bayur											stems
		Pasang	10.000										stems
		Kiriung anak	3.000										stems
		Kimerak	3.500										stems
		Gamelina									1.250		stems
		Mahoni									2.000		stems
		Trembesi									1.000		stems
		Sengon Buto									2.000		stems
		Indeks	1,77		1,38		1,90		1,34		1,57		H'
4	Implementation of Mycorrhizal Fungi for Ecosystem Recovery through	Jumlah Flora					38.000		38.000		25.425		stems
		Indeks					1,90	192.000.000	1,34	134.000.000	2,11	70.000.000	H'

No	Program	Type of Species / Area	Absolutly Results										Satuan
			2020		2021		2022		2023		2024*		
			Absolutely	Anggaran (Rp)	Absolutely	Budget (Rp)	Absolutely	Budget (Rp)	Absolutely	Budget (Rp)	Absolutely	Budget (Rp)	
	Restoration in Conservation Forest Areas [Mount Halimun Salak National Park] Based on Community Empowerment Conservation Village Model [Social Forestry Farmers] – in Cisangku, Nanggung District, Bogor District												
5	KONVERDI : In Situ Conservation and Regeneration of Endangered Dipterocarpus Hasseltii as a Potential Medicinal Plant (Innovation)	Palahlar	-						160	110.000.000	240	152.245.720	stems

*Until June

In general, there has been an increase in the biodiversity index across all conservation areas of PT. ANTAM UBPE. The improvement in PT. ANTAM UBPE's biodiversity protection efforts can be seen from the graph showing the increase in the absolute values of the biodiversity protection program below.



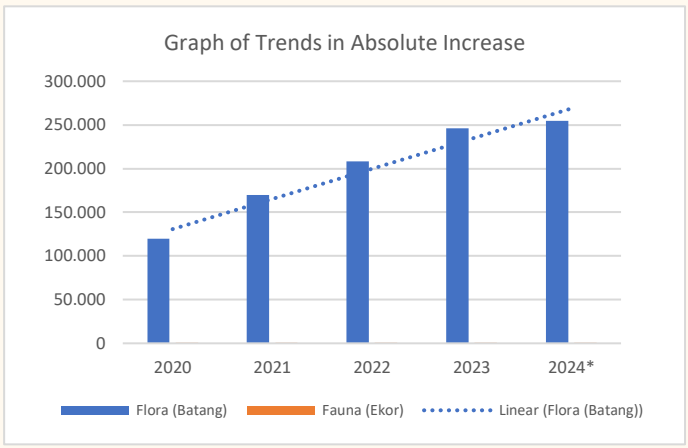


Figure 2. Graph of Biodiversity Trends

3. BIODIVERSITY INDEX CALCULATION METHOD

The biodiversity index value is calculated using the "Shannon-Wiener" index, namely by using the formula :

$$H' = -\Sigma pi \ln pi,$$

Where, $pi = \frac{ni}{N}$

H' = Shannon-Wiener index

ni = Number of individuals of species i

N = Total number of individuals

The following are the criteria for the Shannon - Wiener Index value:

H' < 1: Low diversity;

1 < H' < 3 : Medium diversity;

H' > 3: High diversity.

4. EVIDENCE OF ABSOLUTE DATA CALCULATION FOR BIODIVERSITY PROTECTION PROGRAM

a. Ecosystem Restoration Program of Mount Halimun Salak National Park in Protected Forest Areas

I. Program Description

PT ANTAM, Tbk. – Gold Mining Business Unit (UBP) collaborates with the Mount Halimun Salak National Park Authority in restoration (enrichment) efforts as part of the forest ecosystem recovery and the restoration of the TNGHS area's function through the planting of native/local species, involving the surrounding community. The seedlings used in this planting activity come from PT ANTAM, Tbk. – Gold Mining Business Unit (UBP) nurseries, with the number of plants each year adjusted according to the condition of the degraded land. The number of seedlings planted annually also reflects that the conservation program carried out by PT ANTAM, Tbk. – Gold Mining Business Unit (UBP) has successfully reduced damaged or degraded ecosystems each year.

Figure 3. Documentation of the Implementation of the Mount Halimun Salak National Park Ecosystem Restoration Program

I. Calculation evidence

Example of calculating the biodiversity index in the Mount Halimun Salak National Park Ecosystem Restoration Restoration Program using the Shannon – Wiener method:

Individual index calculation for 2023:

- Number of Rasamala = 70.000 stems
- Total Conserved Flora = 246.000 stems
- Rasamala Index

(H') : [– (70.000/246.000) x Ln (70.000/246.000)]

(H') : 0,35505065

Individual index calculation for 2023:

- Number of Puspa = 60.000 stems
- Total Conserved Flora = 246.000 stems
- Puspa Index

(H') : [– (60.000/246.000) x Ln (60.000/246.000)]

(H') : 0,340678276

Table 4. Recap of Individual Indexes for the Restoration Program for Ecosystem Recovery at Mount Halimun Salak National Park

Program	Species Name	Recap of Index				
		2020	2021	2022	2023	2024*
Restoration of the Mount Halimun Salak	*Rasamala*	0,35502	0,35706	0,35611	0,35764	0,35505
	Puspa	0,34657	0,34769	0,34267	0,34414	0,34068
	Huru	0,20708	0,26462	0,27470	0,29536	0,29086
	Ganitri	0,10310	0,07994	0,15074	0,13462	0,14803
	Kisireum	-	-	0,05149	0,04517	0,04399

Program	Species Name	Recap of Index				
		2020	2021	2022	2023	2024*
National Park Ecosystem in Protected Forest Areas y	*Hamerang*	-	-	0,03557	0,03110	0,03026
	Kondang	-	-	0,03366	0,02942	0,02863
	Darangdan	-	-	0,01916	0,01668	0,01622
	Mara	-	-	0,01450	0,01260	0,01225
	Caringin	-	-	0,01450	0,01260	0,01225
	Kiputri	0,10310	0,07994	0,06873	0,06050	0,05896
	Salam	-	0,16666	0,14591	0,17057	0,16689
	Bayur	0,20708	0,16666	0,14591	0,13019	0,12720
	Pasang	0,29863	0,25177	0,22517	0,20403	0,19991
	Kiriung anak	0,15793	0,12480	0,10830	0,09601	0,09368
	Kimerak	0,10310	0,07994	0,06873	0,06050	0,05896
	Gamelina	-	-	-	-	0,02611
	Mahoni	-	-	-	-	0,03809
	Trembesi	-	-	-	-	0,02177
	Sengon Buto	-	-	-	-	0,03809

The absolute results of the Gunung Halimun Salak National Park Ecosystem Restoration Restoration Program can be seen in Table 5.

*Table 5. Absolute Recap of the Gunung Halimun Salak National Park Ecosystem Restoration Restoration Program 2020 – 2024**

Type of Species / Area	Absolute Results										Unit
	2020		2021		2022		2023		2024*		
	Absolutely	Budget (Rp)	Absolutely	Budget (Rp)	Absolutely	Budget (Rp)	Absolutely	Budget (Rp)	Absolutely	Budget (Rp)	
Area	120		150		220		220		220		Ha
Rasamala	33.000		48.000		58.000		70.000		70.000		stems
Puspa	30.000		43.000		50.000		60.000		60.000		stems
Huru	10.000		22.000		29.000		40.000		40.000		stems
Ganitri	3.500		3.500		10.500		10.500		12.500		stems
Kisireum					2.400		2.400		2.400		stems
Hamerang					1.500		1.500		1.500		stems
Kondang					1.400		1.400		1.400		stems
Darangdan					700		700		700		stems
Mara					500		500		500		stems
Caringin					500		500		500		stems
Kiputri	3.500	280.200.000	3.500	235.500.000	3.500	194.000.000	3.500	114.000.000	3.500	70.000.000	stems
Salam			10.000		10.000		15.000		15.000		stems
Bayur	10.000		10.000		10.000		10.000		10.000		stems
Pasang	20.000		20.000		20.000		20.000		20.000		stems
Kiriung anak	6.500		6.500		6.500		6.500		6.500		stems
Kimerak	3.500		3.500		3.500		3.500		3.500		stems
Gamelina									1.250		stems
Mahoni									2.000		stems
Trembesi									1.000		stems
Sengon Buto									2.000		stems
Index	1,88		1,92		2,06		2,00		2,11		H'

b. Native Wildlife Conservation Program – Release and Monitoring of Key Fauna/Wildlife in the Antam IUP Area and Mount Halimun Salak National Park

I. Program Description

PT ANTAM, Tbk. – Gold Mining Business Unit, in collaboration with the Gunung Halimun Salak National Park Authority, is conducting wildlife conservation efforts. The primary focus is on the reintroduction of specific species into the wild, particularly the Serpent Eagle, Javan Gibbon, and Javan Hawk-eagle. Beyond the release of these animals, PT ANTAM is also implementing a monitoring program to ensure that both the existing wild populations and the reintroduced species remain stable and, ideally, increase over time. This program aims to evaluate the success of the reintroduction efforts and to contribute to the overall conservation of these species. A table below presents the number of animals released and monitored from 2020 to 2024.

Table 6. Recap of animal monitoring

Program	Species Name	Number of Individuals				
		2020	2021	2022	2023	2024*
Native Wildlife Conservation Program – Release and Monitoring of Key Fauna/Wildlife in the Antam IUP Area and Mount Halimun Salak National Park Halimun	*Bido Snake Eagle*	10	12	15	21	21
	Owa Jawa	10	12	18	18	18
	Javanese Eagle	10	12	14	15	15

Figure 4. Recap of animal monitoring

II. Calculation evidence

Example of calculating the biodiversity index for the key fauna/animal conservation program in the PT ANTAM Tbk IUP area. Gold Mining Business Unit using the Shanon-Wiener method:

Individual index calculation for 2023:

- Number of Bido Snake Eagles = 21 Head
- Total Fauna Conserved = 54 Head
- Bido Snake Eagles index

(H') : [– (21/54) x Ln (21/54)]
(H') : 0,36729

Individual Index calculation for 2023:

- Number Of Owa Jawa = 18 Head
- Total Fauna Conserved = 54 Head
- Owa Jawa index

(H') : [– (18/54) x Ln (18/54)]
(H') : 0,36620

Individual Index calculation for 2023:

- Number of Javanese Eagles = 15 Head
- Total Fauna Conserved = 54 Head
- Javanese Eagles index

(H') : [– (15/54) x Ln (15/54)]
(H') : 0,35581

Table 7. Recap of Individual Indexes for Key Fauna/Animal Conservation Programs in PT ANTAM Tbk IUP areas. Gold Mining Business Unit

Program	Species Name	Recap of Index				
		2020	2021	2022	2023	2024*
Conservation of Native Animals – Release and Monitoring of Key Fauna/animals in the Antam IUP area and Mount Halimun Salak National Park	*Bido Snake Eagle*	0,36620	0,36620	0,36450	0,36729	0,36785
	Owa Jawa	0,36620	0,36620	0,36757	0,36620	0,36524
	Javanese Eagle	0,36620	0,36620	0,36075	0,35581	0,36335

The absolute results of the endangered animal reintroduction program can be seen in Table 8.

*Table 8. Absolute Recap of Key Fauna/Animal Conservation Program in PT ANTAM Tbk IUP area. Gold Mining Business Unit 2020 – 2024**

Program	Type of Species / Area	Absolute Results										Unit
		2020		2021		2022		2023		2024*		
		Absolutely	Budget (Rp)	Absolutely	Budget (Rp)	Absolutely	Budget (Rp)	Absolutely	Budget (Rp)	Absolutely	Budget (Rp)	
Conservation of Native Animals – Release and Monitoring of Key Fauna/animals in the Antam IUP area and Mount Halimun Salak National Park	Bido snake Eagle (Spilornis cheela)	10	12.000.000	12	36.000.000	15	156.000.000	21	90.000.000	21	68.000.000	head
	Owa Jawa (Hylobates Moloch)	10		12		18		18		18		head
	Javanese Eagle (Nisaetus bartelsi)	10		12		14		15		15		head
	Index	1,10		1,10		1,09		1,09		1,09		H'

c. Conservation Village Partner Community Empowerment Program through Local Plant Cultivation & Nursery Collaboration(Silviculture Trees Species Local) Mount Halimun Salak National Park Area (TNGHS)

I. Program Description

Cisangku Village is located in Malasari Village, one of the hamlets within the Gunung Halimun Salak National Park (TNGHS). Cisangku Village boasts numerous potentials, including a cool climate, abundant water, fertile land, and stunning natural scenery. These abundant natural resources undoubtedly have the potential to be developed into a tourist destination. Additionally, the villagers' openness and hospitality, which are characteristic of rural life, further support these tourism prospects. However, amidst all these advantages in Cisangku Village, there is a potential impact on the sustainability of the villagers' livelihoods and the preservation of natural resources. This could happen because a significant portion of Cisangku villagers work in agriculture, yet they have limited land. This is due to the fact that their agricultural land is situated within the Gunung Halimun Salak National Park (TNGHS). Since 2019, the Gold Mining Business Unit (UBPE) has involved the Cisangku Model Conservation Village (MKK) Group, committing to community empowerment activities based on environmental conservation. One of these activities involves the cultivation and provision of local plant seedlings, which will subsequently be used for conservation and reclamation purposes by PT ANTAM, Tbk. – Gold Mining Business Unit.

Figure 5. Documentation of the Implementation of the Community Empowerment Program for Conservation Village Partners

II. Calculation evidence

Example of calculating the biodiversity index for the Conservation Village Partners Community Empowerment Program using the Shanon-Wiener method :

Individual Index calculation for 2023:

- Number of Rasamala = 12.000 stems
- Total Conserved Flora = 38.000 stems
- Rasamala Index

(H') : [– (12.000/38.000) x Ln (12.000/38.000)]
(H') : 0,364004

Individual Index calculation for 2023:

- Number of Puspa = 10.000 stems
- Total Conserved Flora = 38.000 stems
- Puspa Index

(H') : [– (10.000/38.000) x Ln (10.000/38.000)]
(H') : 0,351316

Individual Index calculation for 2023:

- Number of Huru = 11.000 stems
- Total Conserved Flora = 38.000 stems
- Huru Index

(H') : [– (11.000/38.000) x Ln (11.000/38.000)]
(H') : 0,358858

Individual Index calculation for 2023:

- Number Of Salam = 5.000 stems
- Total Conserved Flora = 38.000 stems
- Salam Index

(H') : [– (5.000/38.000) x Ln (5.000/38.000)]

(H') : 0,266862

Table 9. Recap of Individual Index of Conservation Village Partners Community Empowerment Program

Program	Species Name	Recap of Index				
		2020	2021	2022	2023	2024*
Empowering Conservation Village Partner Communities through Local Plant Cultivation & Nursery Collaboration (Silvicultur Trees Species Local) Mount Halimun Salak National Park Area (TNGHS) Social] – in Cisangku, Nanggung District, Bogor Regency	*Rasamala*	0,34657	0,36119	0,35132	0,36400	-
	Puspa	0,34657	0,35024	0,31162	0,35132	-
	Huru	0,29863	0,34251	0,31162	0,35886	-
	Ganitri	-	-	0,31162	-	0,34353
	Kisireum	-	-	0,17445	-	-
	Hamerang	-	-	0,12758	-	-
	Kondang	-	-	0,12162	-	-
	Darangdan	-	-	0,07358	-	-
	Mara	-	-	0,05698	-	-
	Caringin	-	-	0,05698	-	-
	Kiputri	0,16576	-	-	-	-
	Salam	-	0,32189	-	0,26686	-
	Bayur	-	-	-	-	-
	Pasang	0,29863	-	-	-	-
	Kiriung anak	0,14979	-	-	-	-
	Kimerak	0,16576	-	-	-	-
	Gamelina	-	-	-	-	0,28592
	Mahoni	-	-	-	-	0,34353
	Trembesi	-	-	-	-	0,25578
	Sengon Buto	-	-	-	-	0,34353

The absolute results of the Conservation Village Partners Community Empowerment program can be seen in Table 10.

*Table 10. Absolute Recap of Conservation Village Partners Community Empowerment Program 2020 – 2024**

Program	Jenis Spesies / Luasan	Hasil Absolutly										Unit
		2020		2021		2022		2023		2024*		
		Absolutely	Budget (Rp)	Absolutely	Budget (Rp)	Absolutely	Budget (Rp)	Absolutely	Budget (Rp)	Absolutely	Budget (Rp)	
Empowerment of Conservation Village Partner Communities through Collaboration in Cultivation & Nursery of	Rasamala	15.000	182.000.000	15.000	389.000.000	10.000	249.000.000	12.000	158.000.000		160.242.347	stems
	Puspa	15.000		13.000		7.000		10.000				stems
	Huru	10.000		12.000		7.000		11.000				stems
	Ganitri					7.000				2.000		stems
	Kisireum					2.400						stems
	Hamerang					1.500						stems
	Kondang					1.400						stems
	Darangdan					700						stems
	Mara					500						stems

Local Plants (Silvicultur Trees Local Species) in the Mount Halimun Salak National Park Area (TNGHS)	Caringin					500						stems
	Kiputri	3.500										stems
	Salam			10.000				5.000				stems
	Bayur											stems
	Pasang	10.000										stems
	Kiriung anak	3.000										stems
	Kimerak	3.500										stems
	Gamelina									1.250		stems
	Mahoni									2.000		stems
	Trembesi									1.000		stems
	Sengon Buto									2.000		stems
	Index	1,77		1,38		1,90		1,34		1,57		H'

d. Mycorrhizal Fungi Implementation Program for Ecosystem Recovery through Restoration in Conservation Forest Areas [Mount Halimun Salak National Park] Based on Community Empowerment Conservation Village Model [Social Forestry Farmers] – in Cisangku, Nanggung District, Bogor District

I. Program Description

PT ANTAM Tbk. The Gold Mining Business Unit is striving to restore contaminated/degraded land within the Gunung Halimun Salak National Park (TNGHS) conservation forest area through an Ecosystem Recovery Program based on community empowerment in the Model Conservation Village (Social Forestry Farmers) in Cisangku. This restoration program is combined with an innovation that utilizes mycorrhiza, a type of fungus that can accelerate plant growth and expedite the absorption of heavy metals through plant roots (phytoremediation).

The application of mycorrhizal fungi to plant seedlings in the community nursery of the Cisangku Conservation Village partner has resulted in significant efficiencies in seedling maintenance. The time required for seedling care has been reduced from 12 months to 8 months. Additionally, the use of mycorrhizal fungi has increased plant survival rates from 65-75% to 96%, thereby reducing the need for seedling replacement

Figure 6. Documentation of the Mycorrhizal Fungi Implementation Program

II. Calculation evidence

Example of calculating the biodiversity index in the Transitional Mycorrhizal Fungi Implementation Conservation program using the Shanon-Wiener method:
Individual index calculation for 2023 :

Individual Index calculation for 2023:

- Number of Rasamala = 12.000 stems
- Total Conserved Flora = 38.000 stems
- Rasamala Index

(H') : [– (12.000/38.000) x Ln (12.000/38.000)]
(H') : 0,364004

Individual Index calculation for 2023:

- Number of Puspa = 10.000 stems
- Total Conserved Flora = 38.000 stems
- Puspa Index

(H') : [– (10.000/38.000) x Ln (10.000/38.000)]
(H') : 0,351316

Individual Index calculation for 2023:

- Number of Huru = 11.000 stems
- Total Conserved Flora = 38.000 stems
- Huru Index

(H') : [– (11.000/38.000) x Ln (11.000/38.000)]
(H') : 0,358858

Individual Index calculation for 2023:

- Number of Salam = 5.000 stems
- Total Conserved Flora = 38.000 stems
- Salam Index

(H') : [– (5.000/38.000) x Ln (5.000/38.000)]
(H') : 0,266862

Table 11. Recap of Individual Index of Mycorrhizal Fungi Implementation Program

Program	Species Name	Recap of Index		
		2022	2023	2024*
Implementation of Mycorrhizal Fungi for Ecosystem Recovery through Restoration in Conservation Forest Areas [Mount Halimun Salak National	*Rasamala*	0,35132	0,36400	0,3551
	Puspa	0,31162	0,35132	0,3408
	Huru	0,31162	0,35886	0,2910
	Ganitri	0,31162	-	0,1481
	Kisireum	0,17445	-	0,0440
	Hamerang	0,12758	-	0,0303
	Kondang	0,12162	-	0,0286

Program	Species Name	Recap of Index		
		2022	2023	2024*
Park] Based on Community Empowerment Conservation Village Model [Social Forestry Farmers] – in Cisangku, Nanggung District, Bogor District	*Darangdan*	0,07358	-	0,0162
	Mara	0,05698	-	0,0123
	Caringin	0,05698	-	0,0123
	Kiputri	-	-	0,0590
	Salam	-	0,26686	0,1670
	Bayur	-	-	0,1273
	Pasang	-	-	0,2000
	Kiriung anak	-	-	0,0937
	Kimerak	-	-	0,0590
	Gamelina	-	-	0,0261
	Mahoni	-	-	0,0381
	Trembesi	-	-	0,0218
	Sengon Buto	-	-	0,3551

Absolute results of the Mycorrhizal fungus implementation program can be seen in Table 12.

Table 12. Absolute Recap of Mycorrhizal Fungi Implementation Program 2022 – 2024

Program	Type of Species / Area	Absolutly Results						Unit
		2022		2023		2024*		
		Absolutly	Budget (Rp)	Absolutly	Budget (Rp)	Absolutly	Budget (Rp)	
Implementation of Mycorrhizal Fungi for Ecosystem Recovery through Restoration in Conservation Forest Areas [Mount Halimun Salak National Park] Based on Community Empowerment Conservation Village Model [Social Forestry Farmers] – in Cisangku, Nanggung District, Bogor District	Number of Flora	38.000	192.000.000	38.000	134.000.000	25.425	70.000.000	stems
	Index	1,90		1,34		2,11		H'

e. KONVERDI : In-Situ Conservation and Regeneration of Endangered Dipterocarpus Hasseltii as a Potential Medicinal Plant

I. Program Description

PT. PT ANTAM Tbk. Gold Mining Business Unit (UBPE) Pongkor operates in an area largely located within the conservation zone of Mount Halimun Salak National Park (TNGHS). TNGHS is known for its extremely high and diverse genetic wealth, which must be preserved to maintain the sustainability of its ecosystem. One of the key efforts undertaken by PT ANTAM Tbk. UBPE Pongkor to support this preservation is through ecosystem restoration activities. A primary focus of these restoration efforts is the in-situ conservation of a rare plant endemic to TNGHS, Dipterocarpus hasseltii. This species is categorized as endangered according to criterion A2cd of the IUCN Red

List. This status indicates that Dipterocarpus hasseltii faces a significant risk of extinction in the near future due to ongoing population decline.

The in-situ conservation activities conducted by PT ANTAM Tbk. UBPE Pongkor involve the use of genotyping techniques to ensure the accurate identification of the species to be conserved. Before the conservation activities begin, a comprehensive habitat assessment is conducted to determine the most suitable species for preservation. This is important because the genus Dipterocarpus comprises several species with varying conservation statuses, making the correct selection of species crucial to the success of the conservation efforts.

In its implementation, PT ANTAM Tbk. UBPE Pongkor has conserved 240 Dipterocarpus hasseltii plants through generative propagation methods and homogeneous forest tree breeding. Generative propagation allows for the natural reproduction of plants through seeds, while homogeneous forest tree breeding aims to produce tree populations with uniform genetic characteristics, supporting the sustainability of the species in its natural habitat.

This conservation effort is not only aimed at protecting Dipterocarpus hasseltii from the threat of extinction but also contributes to the recovery and preservation of the ecosystem in TNGHS, which is an integral part of environmental sustainability in the region.

Gambar 7. Documentation of the Implementation of the Palahlar Plant Genetic Conservation Program

Table 13. Recap of Plant monitoring

Program	Species	2023	2024*	Unit
Nursery	Palahlar (*Dipterocarpus hasseltii*)	160	240	seedling
Growth			50	%

II. Calculation evidence

The calculation of the number of palahlar (Dipterocarpus hasseltii) that were propagated began in 2023..

Program Calculation in 2023		
Number of Palahlar bred (A)	=	160
Number of dead Palahlars (B)	=	0
Total Number of Palahlars at the end of the Year (C=A-B)	=	160
total individuals (N)	=	160
Program Calculation in 2024		
Number of Palahlar bred (A)	=	240
Number of dead Palahlars (B)	=	0
Total Number of Palahlars at the end of the Year (C=A-B)	=	240
total individuals (N)	=	240

The absolute results of the KONVERDI : In Situ Conservation and Regeneration of Endangered Dipterocarpus Hasseltii as a Potential Medicinal Plant can be seen in Table 14.

Table 14. Absolute Summary of the KONVERDI : In Situ Conservation and Regeneration of Endangered Dipterocarpus Hasseltii as a Potential Medicinal Plant for the years 2023– 2024

Type of Species/ Area	Absolutly Result				Unit
	2023		2024*		
	Absolutly	Budget (Rp)	Absolutly	Budget (Rp)	
Palahlar	160	Rp. 110.000.000,00	240	Rp 152.245.720,00	stems

5. RECAPITULATION OF BIODIVERSITY PROTECTION RESULTS

The following is a table of biodiversity protection for the year 2023

Table 15. Results of Plant Biodiversity Protection in PT. ANTAM UBPE

No	Nama lokal	Jumlah	pi (ni/N)	ln pi	pi ln pi
1	*Rasamala*	70.000	0,284367891	1,257486489	0,357588781
2	*Puspa*	60.000	0,243743906	1,411637169	0,344077958
3	*Huru*	40.000	0,162495938	1,817102277	0,295271738
4	*Ganitri*	10.500	0,042655184	3,154606474	0,134560318
5	*Kisireum*	2.400	0,009749756	4,630512994	0,045146373
6	*Hamerang*	1.500	0,006093598	5,100516623	0,031080496
7	*Kondang*	1.400	0,005687358	5,169509494	0,02940085
8	*Darangdan*	700	0,002843679	5,862656675	0,016671513
9	*Mara*	500	0,002031199	6,199128912	0,012591666
10	*Caringin*	500	0,002031199	6,199128912	0,012591666
11	*Kiputri*	3.500	0,014218395	4,253218763	0,060473942
12	*Salam*	15.000	0,060935977	2,79793153	0,17049469
13	*Bayur*	10.000	0,040623984	3,203396638	0,130134735
14	*Pasang*	20.000	0,081247969	2,510249457	0,20395267
15	*Kiriung anak*	6.500	0,02640559	3,634179554	0,095962655
16	*Kimerak*	3.500	0,014218395	4,253218763	0,060473942
17	*Palahlar*	160	0,284367891	1,257486489	0,357588781
	Amount	**246.160**	**Diversity Indeks (H')**		**2,000474**

Table 16. Results of PT ANTAM Tbk Fauna Biodiversity Protection. Gold Mining Business Unit

No	Local Name	Scientific Name	Amount	pi	ln pi	PI * ln pi
1	*Bido Snake Eagle*	Spilornis cheela	21	0,388888889	0,944461609	0,367290626
2	*Owa Jawa*	Hylobates Moloch	18	0,333333333	1,098612289	0,366204096
3	*Javanese Eagle*	Nisaetus bartelsi	15	0,277777778	1,280933845	0,355814957
Amount (Head)			47			1,0893097
Diversity Index			**1,0893097**			