

CCB & VCS MONITORING REPORT 7



Project title	Katingan Peatland Restoration and Conservation Project
Project ID	1477
Crediting period	01 November 2010 – 31 October 2070; 60-year lifetime
Monitoring period	VCS 01 January 2021 – 31 December 2023 CCB 01 January 2020 – 31 December 2023
(CCB) GHG accounting period	VCS 01 January 2021 – 31 December 2023; 3-year period
Original date of issue	13 July 2025
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Version	3.0
VCS Standard version	VCS Standard 4.7
CCB Standards version	CCB Standards 3.1
Project location	Indonesia; Central Kalimantan
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Validation/verification body	AENOR Confia S.A.U, Jose Luis Fuentes Perez, jfuentes@aenor.com (+34) 914 326 000
History of CCB Status	Verification Statement 1: 14 August 2018 Verification Statement 2: 12 October 2020
Gold Level criteria	Exceptional Biodiversity Benefits The project protects 149,800 ha of peat swamp habitat within a Key Biodiversity Area. Since the project's inception, monitoring has recorded 109 threatened species (i.e., those listed as Critically Endangered (CR), Endangered (EN) or Vulnerable (VU) on the IUCN Red List), which includes the Bornean Orangutan (<i>Pongo pygmaeus</i>) and Sunda Pangolin (<i>Manis javanica</i>). Ongoing forest protection ensures stable populations and reduces threats to biodiversity. Exceptional Community Benefits Through participatory planning and 80 MoUs with 34 villages and 5 sub-districts, the project has strengthened livelihoods, education, health, and local governance. As a result, 3,987 people—including 599 women—have increased their income, and 6,581 individuals have experienced improved well-being. An average of 176 jobs per year were created, with 82% filled by local people. 391 local community members secured decent jobs through project activities. Capacity building reached 44 local institutions, including village forest groups (LPHD), women's groups, village-owned enterprises (BumDes), and community forest fire response teams (RSA/MPA). No fires have occurred in the project zone, reflecting strong community engagement and collaboration with local stakeholders. Climate Change Adaptation Benefits Hydrological restoration was achieved through rewetting and construction of 34 canal blocks, protecting 157,875 ha¹ of peatland. These actions enhance landscape resilience to drought and fire, while

¹ This number reflects the total extent of peatland landscape benefiting from the project's hydrological restoration and protection measures.

	helping communities adapt through climate-smart agriculture and ecosystem-based management.
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1 SUMMARY OF PROJECT BENEFITS

1.1 Unique Project Benefits

Outcome or Impact	Achievements during the Monitoring Period	Section Reference	Achievements during the Project Lifetime
1) Peat subsidence prevention through rewetting and canal blocking	34 canal blocks were constructed to support hydrological restoration. between 2020 and 2023. These efforts were concentrated in key areas within the project zone: the Hantipan area (Kelampan Besar, Satar, Sekawan canals), the Perigi area (Anjir Perigi, Gery, and Rasau canals), and the southern area (Sasuai and Idak canals). While these interventions aim to reduce peat subsidence, exact measurements are still under evaluation.	Section 3.4 / Rewetting & Hydrology	Total of 80 canal blocks constructed to support hydrological restoration of project area.
2) Community engagement through participatory planning	A total of 14,313 community members participated in 208 participatory planning meetings, with women comprising 77% of the participants. 80 MoUs signed with 34 villages and 5 sub-districts.	Section 4.2 / Participatory Planning	MoU with 34 villages and 5 sub-districts since 2015
3) Installation of renewable energy infrastructure to promote sustainable livelihoods	The project installed 29 solar panel systems in Tampelas villages to provide renewable energy for households, community facilities, and an	Section 2.2 / Renewable Energy & Communit	Renewable energy access has transformed livelihoods and public services in remote villages,

	albumin processing factory. This initiative reduced reliance on fossil fuels and enabled economic activities powered by clean energy, contributing to climate action and local development.	y Developme nt	improving energy security and reducing greenhouse gas emissions from traditional energy sources.
4) Fire prevention and landscape protection	No large-scale fires recorded across 149,800 ha; 1,380 community members trained in fire response and awareness. Zero fire incidents were recorded across 149,800 hectares of the project area—achieved through a robust forest fire prevention strategy that combined early detection systems, a strong fire management structure, active community engagement, and close collaboration with local government.	Section 5 / Fire Prevention	No large-scale fires recorded across 149,800 ha; 1,380 community members trained in fire response and awareness.
5) Habitat connectivity and ecosystem integrity enhancement	The project safeguarded extensive areas of peat swamp forest that maintain landscape connectivity, ensuring wildlife corridors between the project area and adjacent protected areas like Sebangau National Park. This connectivity is critical for wide-ranging species, supports gene flow, and contributes to the resilience of species populations to climate change.	Section 5.2 / Offsite Biodiversit y Impacts	Since project inception, the project has maintained connectivity between previously fragmented habitats, contributing to a more cohesive ecological landscape and supporting long-term ecosystem function.

1.2 Standardized Benefit Metrics

Category	Metric	Achievements during Monitoring Period	Section Reference	Achievements during the Project Lifetime
GHG emission reductions & removals	<i>Net estimated emission removals in the project area, measured against the without-project scenario</i>	0 tonnes CO ₂ e	3	0 tonnes CO ₂ e
	<i>Net estimated emission reductions² in the project area, measured against the without-project scenario</i>	17,357,446 tonnes CO ₂ e ²	3	55,306,737 tonnes CO ₂ e
Forest ³ cover	<i>For REDD⁴ projects: Number of hectares of reduced forest loss in the project area measured against the without-project scenario</i>	11,917.2 ha	3	71,085 ha
	<i>For ARR⁵ projects: Number of hectares of forest cover increased in the project area measured against the without-project scenario</i>	N/A	N/A	N/A
Improved land management	<i>Number of hectares of existing production forest land in which IFM⁶ practices have occurred as a result of the project's activities, measured against the without-project scenario</i>	N/A	N/A	N/A
	<i>Number of hectares of non-forest land in which improved land management has occurred as a result of the project's</i>	5,022		5,022

² The reported figure for emission reductions (17,357,446 tCO₂e) represents net reductions and already accounts for carbon stock losses (236,572 tCO₂e) due to illegal logging and forest degradation during the monitoring period.

³ Land with woody vegetation that meets an internationally accepted definition (e.g., UNFCCC, FAO, or IPCC) of what constitutes a forest, which includes threshold parameters, such as minimum forest area, tree height and level of crown cover, and may include mature, secondary, degraded and wetland forests (VCS Program Definitions)

⁴ Reduced emissions from deforestation and forest degradation (REDD) – Activities that reduce GHG emissions by slowing or stopping conversion of forests to non-forest land and/or reduce the degradation of forest land where forest biomass is lost (VCS Program Definitions)

⁵ Afforestation, reforestation and revegetation (ARR) – Activities that increase carbon stocks in woody biomass (and in some cases soils) by establishing, increasing and/or restoring vegetative cover through the planting, sowing and/or human-assisted natural regeneration of woody vegetation (VCS Program Definitions)

⁶ Improved forest management (IFM) – Activities that change forest management practices and increase carbon stock on forest lands managed for wood products such as saw timber, pulpwood, and fuelwood (VCS Program Definitions)

	<i>activities, measured against the without-project scenario</i>			
Training	<i>Total number of community members who have improved skills and/or knowledge resulting from training provided as part of project activities</i>	2,364 people		4,092 people
	<i>Number of female community members who have improved skills and/or knowledge resulting from training provided as part of project activities of project activities</i>	901 females		1,424 females
Employment	<i>Total number of people employed in project activities,⁷ expressed as number of full-time employees⁸</i>	An average of 176 people per year.		391 people An average of 176 people per year from 2020-2023
	<i>Number of women employed in project activities, expressed as number of full-time employees</i>	An average of 38 women per year.		46 women
Livelihoods	<i>Total number of people with improved livelihoods⁹ or income generated as a result of project activities</i>	3,987 people		7,866 people
	<i>Number of women with improved livelihoods or income generated as a result of project activities</i>	599 females		1,208 females
Health	<i>Total number of people for whom health services were improved as a result of project activities, measured against the without-project scenario</i>	2,417 people		3,283 people

⁷ Employed in project activities means people directly working on project activities in return for compensation (financial or otherwise), including employees, contracted workers, sub-contracted workers, and community members that are paid to carry out project-related work.

⁸ Full time equivalency is calculated as the total number of hours worked (by full-time, part-time, temporary and/or seasonal staff) divided by the average number of hours worked in full-time jobs within the country, region, or economic territory (adapted from UN System of National Accounts (1993) paragraphs 17.14[15.102]; [17.28])

⁹ Livelihoods are the capabilities, assets (including material and social resources) and activities required for a means of living (Krantz, Lasse, 2001. *The Sustainable Livelihood Approach to Poverty Reduction*. SIDA). Livelihood benefits may include benefits reported in the Employment metrics of this table.

	<i>Number of women for whom health services were improved as a result of project activities, measured against the without-project scenario</i>	1,622 women		2,174 women
Education	<i>Total number of people for whom access to, or quality of, education was improved as a result of project activities, measured against the without-project scenario</i>	640 people		1,051 people
	<i>Number of women and girls for whom access to, or quality of, education was improved as a result of project activities, measured against the without-project scenario</i>	320 women		485 women
Water	<i>Total number of people who experienced increased water quality and/or improved access to drinking water as a result of project activities, measured against the without-project scenario</i>	268 people		1,301 people
	<i>Number of women who experienced increased water quality and/or improved access to drinking water as a result of project activities, measured against the without-project scenario</i>	77 women		564 women
Well-being	<i>Total number of community members whose well-being¹⁰ was improved as a result of project activities</i>	6,581 community members (unique number) participated in project activities related to livelihood, education, water quality and healthcare programmes		32,124 community members
	<i>Number of women whose well-being was improved as a result of project activities</i>	2,308 women		6,878 women

¹⁰ Well-being is people's experience of the quality of their lives. Well-being benefits may include benefits reported in other metrics of this table (e.g. Training, Employment, Health, Education, Water, etc.), but could also include other benefits such as empowerment of community groups, strengthened legal rights to resources, conservation of access to areas of cultural significance, etc.

Biodiversity conservation	<i>Change in the number of hectares significantly better managed by the project for biodiversity conservation,¹¹ measured against the without-project scenario</i>			149,800
	<i>Number of globally Critically Endangered or Endangered species¹² benefiting from reduced threats as a result of project activities,¹³ measured against the without-project scenario</i>	During this monitoring period: 2 CR and 19 EN fauna species were recorded.		Since the project's inception, five CR and 26 EN fauna species, along with four CR and eight EN flora species have been recorded.

2 PROJECT DETAILS

2.1 Summary Description of the Implementation Status of the Project

2.1.1 Summary Description of the Project (VCS, 2.1, 3.6; CCB, G1.2)

Implementation Status

Technologies/Measures and Implementation Dates:

The project has developed a range of direct and supporting activities, including agroforestry, aquaculture, ecotourism, education, fire prevention, illegal logging and poaching prevention, livestock, microfinance, non-timber forest product (NTFP) development, participatory planning, public health, reforestation, renewable energy, rewetting, small and medium enterprise development, social forestry facilitation, species conservation and monitoring, stakeholder engagement, local institution strengthening, water, sanitation, and hygiene (WASH), along with supporting activities like communications, finance, gender equality and social inclusion mainstreaming, health, safety, environment, and social (HSES), human resources development, and research and development.

These activities have been progressively implemented since the project began.

¹¹ Biodiversity conservation in this context means areas where specific management measures are being implemented as a part of project activities with an objective of enhancing biodiversity conservation.

¹² Per IUCN's Red List of Threatened Species

¹³ In the absence of direct population or occupancy measures, measurement of reduced threats may be used as evidence of benefit

GHG Emission Reductions and Carbon Dioxide Removals:

During the monitoring period (January 1st, 2020 - December 31st, 2023), the project avoided the emission of 17,357,446 tonnes CO₂e.

Project Objectives

The Katingan Mentaya Project protects and is restoring 157,875 hectares (of which the project carbon accounting area is 149,800 ha) of peatland ecosystems in Central Kalimantan. The project was launched in 2010 and has delivered a decade and a half of activities designed to achieve its overarching *climate, community and biodiversity* objectives set out in the original Project Description (PD) phase (2016).

- **Climate:** To develop and implement a sustainable land use model that reduces emissions from deforestation and degradation, promotes conservation, enhances ecological integrity, and mitigates climate change impacts.
- **Community:** To generate economic opportunities and enhance the well-being of local communities, focusing on poverty alleviation, education, health, and sustainable livelihoods.
- **Biodiversity:** To conserve and protect the rich biodiversity of the area, including critically endangered species like the Bornean Orangutan (*Pongo pygmaeus*) and Sunda Pangolin (*Manis javanica*), through habitat restoration and species conservation efforts.

The project's Theory of Change (TOC) develops these objectives (see PD 2020-2030), linking direct and supporting activities to anticipated outputs, outcomes, and impacts, with a focus on community engagement and strategic adaptation. This structured approach ensures the alignment of project activities with the UN Sustainable Development Goals (SDGs) and the overall vision of climate, community, and biodiversity conservation.

2.1.2 Audit History (VCS, 4.1)

Audit Type	Period	Program me	VVB Name	Number of years
Validation	May 11, 2016	VCS & CCB	SCS Global Services	60 years
Validation	01-November-2010 to 31-October-2070	VCS & CCB	SCS Global Services	60 years
Verification	November 1, 2010 to October 31, 2015	VCS & CCB	SCS Global Services	5 years

Verification	November 1, 2015 to October 31, 2016	VCS	Aster Global Environmental Solutions Inc.	1 year
Verification	VCS: January 1, 2017 to December 31, 2017 CCB: November 1, 2015 to December 31, 2017	VCS & CCB	Aster Global Environmental Solutions Inc.	VCS: 1 year CCB: 2 years
Verification	January 1, 2018 to December 31, 2018	VCS	Aster Global Environmental Solutions Inc.	1 year
Verification	VCS: January 1, 2019 to December 31, 2019 CCB: January 1, 2018 to December 31, 2019	VCS & CCB	Aster Global Environmental Solutions Inc.	VCS: 1 year CCB: 2 years
Verification	VCS: January 1, 2020 to December 31, 2020	VCS	Aster Global Environmental Solutions Inc.	VCS: 1 year
Verification	VCS: January 1, 2021 – December 31, 2023 CCB: January 1, 2020 – December 31, 2023	VCS & CCB	AENOR	VCS: 3 years CCB: 4 years

2.1.3 Sectoral Scope and Project Type (VCS, 3.2)

Sectoral Scope	14: Agriculture, forestry, and other land use
AFOLU Project Category	The Katingan Mentaya Project includes the following eligible AFOLU project categories: Reduced Emissions from Deforestation and Degradation (REDD) and Wetlands Restoration and Conservation (WRC).

Project Activity Type	The project activities are categorised under the VCS as a combination of REDD+WRC; specifically, as Avoiding Planned Deforestation (APD), in combination with Conservation of Undrained and Partially drained Peatland (CUPP) and Rewetting of Drained Peatland (RDP) activities.
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2.1.4 Project Proponent (VCS, 3.7; CCB, G1.1)

Organisation name	PT. Rimba Makmur Utama (PT. RMU)
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2.1.5 Other Entities Involved in the Project

Organization name	Permian Global
Role in the project	Technical advice and support, including: MRV methodology design and technical facilitation Remote sensing Carbon commercialization and marketing Technical management advice including protection and restoration methods
Contact person	Juan Chang
Title	Head of Technical Operations
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2.1.6 Project Start Date (VCS, 3.8)

Project start date	01-November-2010
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Justification	Following the VCS definition of start date (the date on which activities that lead to the generation of GHG emission reductions or removals are implemented), the project start date is November 1, 2010. PT. RMU submitted a technical proposal to the Ministry of Forestry in 2008. The application was acknowledged and instructed to proceed with a partial environmental impact assessment of the project area (the status known as SP-1) in 2009. At this stage, the application process blocked other applications for the concession area, importantly, it blocked applications from activities that could have generated emissions i.e. acacia plantation applications. November 1, 2010, is the date when the Katingan Mentaya Project commenced field survey activities inside the project area, and it also coincides with the time when baseline emissions would have started, had the project not blocked any further applications by reserving the project area. Therefore, this date will be used as the calculation base for the historical reference period required for setting a baseline scenario, and for the project crediting period as required by the methodological standards of the VCS guidelines.
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2.1.7 Benefits Assessment and Project Crediting Period (VCS, 3.9; CCB, G1.9)

Crediting Period	The duration of the VCS project crediting period is 60 years, beginning on the project start date of November 1, 2010 and ending on October 31, 2070, and credits will be calculated against the baseline scenario at the time of the project start. The project crediting period is renewable. The project crediting period is set initially for 60 years, which is in line with the lifetime of the Katingan Mentaya Project based on the term of the ecosystem restoration concession (IUPHHK-RE) held by PT RMU.
Start Date of First or Fixed Crediting Period	01 November 2010 – 31 October 2070
Total Number of Years of Crediting Period	60
CCB Benefits Assessment Period	01 January 2020 – 31 December 2023

2.1.8 Project Location (VCS, 3.11; CCB, G1.3)

The Katingan Mentaya Project is located within the Mendawai, Kamipang, Seranau, and Pulau Hanaut sub-districts of the Katingan and Kotawaringin Timur districts, Central Kalimantan Province, Republic of Indonesia (see Figure 2.1). The project lies within the following geographic coordinates 3° 1' 43.8" S to 2° 3' 52.11" S latitude and 113° 1' 10.38" E to 113° 18' 21.48" E longitude.

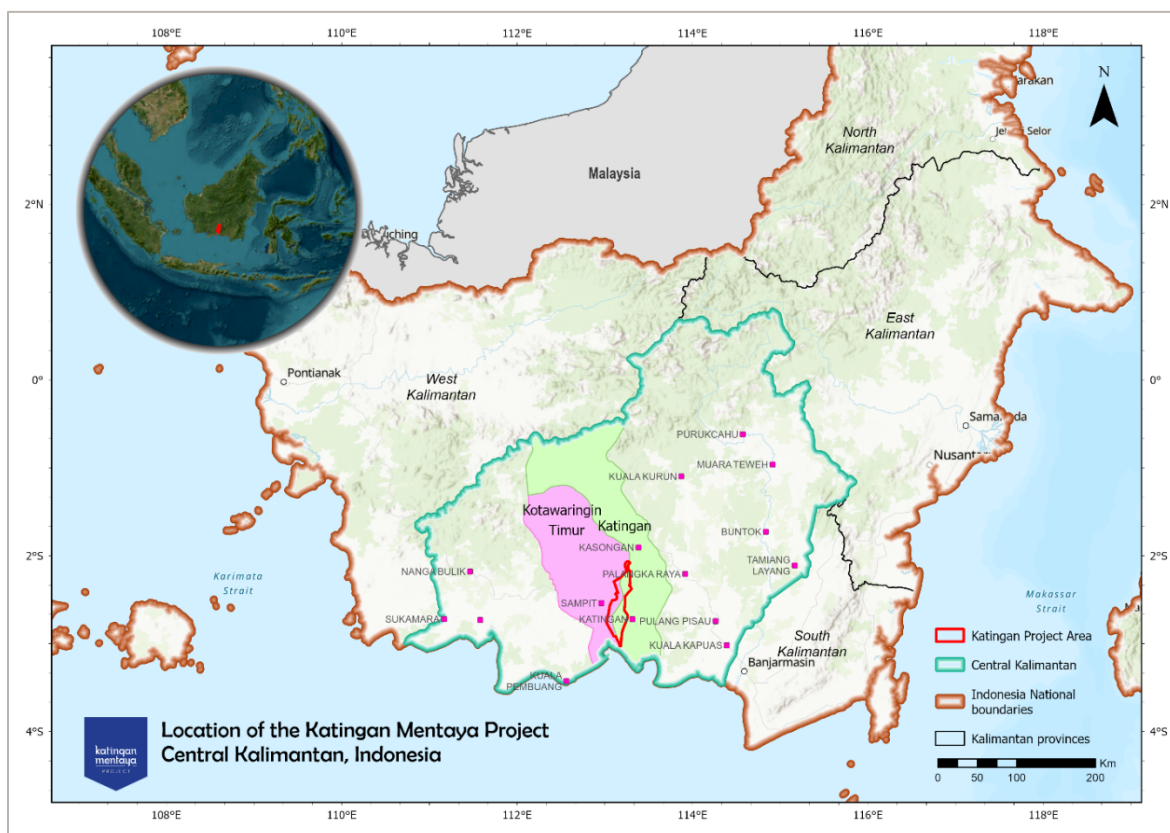


Figure 2.1. Location of the Katingan Mentaya Project in Kalimantan, Indonesia.

☒ KML file has been provided

2.1.9 Title and Reference of Methodology (VCS, 3.1)

Type (methodology, tool, module)	Reference ID (if applicable)	Title	Version
Methodology	VM0007	VM0007 REDD+ Methodology Framework (REDD+MF)	1.8
Module	VMD0042 BL-PEAT	VMD0042 Estimation of baseline soil carbon stock changes and greenhouse gas emissions in peatland rewetting	1.1

		and conservation project activities (BL-PEAT)	
Module	VMD0016 X-STR	VMD0016 Methods for Stratification of the Project Area (X-STR)	1.2
Module	VMD0017 X-UNC	VMD0017 Estimation of Uncertainty for REDD+ Project Activities (X-UNC)	2.2
Module	VMD0013 E-BPB	VMD0013 Estimation of greenhouse gas emissions from biomass and peat burning (E-BPB)	1.3
Module	VMD0009 LK-ASP	VMD0009 Estimation of emissions from activity shifting for avoiding planned deforestation/forest degradation and avoiding planned wetland degradation (LK-ASP)	1.3
Module	VMD0044 LK-ECO	VMD0044 Estimation of emissions from ecological leakage (LK-ECO)	1.1
Module	VMD0046 M-PEAT	VMD0046 Methods for monitoring of soil carbon stock changes and greenhouse gas emissions and removals in peatland rewetting and conservation project activities (M-PEAT)	1.1
Module	VMD0006 BL-PL	VMD0006 Estimation of baseline carbon stock changes and greenhouse gas emissions from planned deforestation/forest degradation and planned wetland degradation (BL-PL)	1.3
Module	VMD0015 M-REDD	VMD0015 Methods for monitoring of GHG emissions and removals in REDD and CIW projects (M-REDD)	2.3
Module	VMD0001 CP-AB	VMD0001 Estimation of carbon stocks in the above and belowground biomass in live tree and non-tree pools (CP-AB)	1.2
CDM A/R Tool	T-SIG	Tool for testing significance of GHG emissions in A/R CDM project activities	1

Tool	VT0001	VT0001 Tool for the demonstration and assessment of additionality in VCS agriculture, forestry and other land use (AFOLU) project activities	3.0
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2.1.10 Double Counting and Participation under Other GHG Programs (VCS, 3.23; CCB, G5.9)

2.1.10.1 No Double Issuance

Is the project receiving or seeking credit for reductions and removals from a project activity under another GHG program, or any other form of community, social, or biodiversity unit or credit?

☐ Yes ☒ No

2.1.10.2 Registration in Other GHG Programs

Was the project registered or seeking registration under any other GHG programs?

☐ Yes ☒ No

2.1.10.3 Projects Rejected by Other GHG Programs

Has the project been rejected by any other GHG programs?

☐ Yes ☒ No

2.1.11 Double Claiming, Other Forms of Credit, and Scope 3 Emissions (VCS, 3.24)

2.1.11.1 No Double Claiming with Emissions Trading Programs or Binding Emission Limits

Are project reductions and removals or project activities also included in an emissions trading program or binding emission limit? See the VCS Program Definitions for definitions of emissions trading program and binding emission limit.

☐ Yes ☒ No

2.1.11.2 No Double Claiming with Other Forms of Environmental Credit

Has the project activity sought, received, or is planning to receive credit from another GHG-related environmental credit system? See the VCS Program Definitions for definition of GHG-related environmental credit system.

☐ Yes ☒ No

2.1.11.3 Supply Chain (Scope 3) Emissions

Do the project activities affect the emissions footprint of any product(s) (goods or services) that are part of a supply chain?

☐ Yes ☒ No

Is the project proponent(s) or authorized representative a buyer or seller of the product(s) (goods or services) that are part of a supply chain?

☐ Yes ☒ No

Has the project proponent(s) or authorized representative posted a public statement on their website saying, “Carbon credits may be issued through Verified Carbon Standard project [project ID] for the greenhouse gas emission reductions or removals associated with [project proponent or authorized representative organization name(s)] [name of product(s) whose emissions footprint is changed by the project activities].”?

☐ Yes ☐ No

2.1.12 Sustainable Development Contributions (VCS, 3.17)

Between 2020–2023, the Katingan Mentaya Project (KMP) implemented comprehensive actions in Central Kalimantan, Indonesia, advancing peatland conservation, community empowerment, and sustainable development. The project supported 17 SDGs through forest protection, livelihood diversification, gender equity, education, health, and good governance. KMP safeguarded 149,800 ha of peat swamp forest, reforested 1,661 ha, and achieved zero fires. It created over 390 jobs, improved education for 241 adults and 21 schools, and supported 55 health posts. Women and 11 villages gained empowerment and tenure rights, while 80 MoUs ensured transparency. Monitoring and reporting were conducted through the SIRETA platform (see Appendix 5).

Table 2.1: Sustainable Development Contributions

Row number	SDG target	SDG indicator	Net impact on SDG indicator	Current project contributions	Contributions over project lifetime
1	1.1 / 1.2 / 1.3	1.1.1 / 1.2.1 / 1.3.1	Poverty reduction via formal jobs & social protection	Avg. 176 employees/year ($\approx$ 704 job-years), 82% locally hired; 391 community members with paid work; health & pension coverage for staff; accident insurance for long-term casual workers.	Maintain $\sim$ 180 jobs/year with wages above poverty line; continued social security per law; tracked via SIRETA and BPS/Bappenas.
2	1.4.1	Proportion of population with access to basic services	Improved access to livelihoods, education, health, and WASH	Livelihoods: 3,987 people; Education & culture: 640; Health: 2,417; WASH: 268.	Ongoing maintenance and gradual expansion per district plans; annual monitoring in SIRETA and sector offices.
3	1.4.2	Secure tenure rights to land	Strengthened land tenure (Social Forestry)	11 communities with 35-year legal rights (35,855 ha).	Rights maintained (MoEF permits); community governance verified; recorded in SIRETA.
4	2.3 / 2.4	2.3.1 / 2.4.1	Climate-smart agriculture & productivity	909 farmers trained/registered; 891 ha under no-burn/organic practices; 122 ha demo plots; 401 people involved.	Sustain and expand climate-resilient management across 11 villages; annual reporting (MoA/SIRETA).

5	2.2 / 3.1–3.3 / 3.7–3.9	(stunting, TB, essential services)	Rural health & nutrition	55 Posyandu in 34 villages; 2,599 patients via boat clinic; ISPA/ARI education (~1,580 participants); SRHR education (>1,300 women & youth); TB support (~150 cases, 2022–2023).	Consolidate Posyandu network and boat clinic; sustained improvements in essential service coverage (MoH/SIRETA).
6	4.3 / 4.4 / 4.a	Non-formal education, skills, school services	Education access & skills	241 adults in Kejar Paket (40 certified, 78% women); support to 2 agroecology vocational schools; school WASH (toilets/handwashing); 2 river boat schools; libraries/materials.	Continued non-formal and TVET programs; maintenance of basic school services (district data/SIRETA).
7	5.1 / 5.5 / 5.6	Gender equality & women's leadership	Economic empowerment & SRHR	11 women's groups (83 active) with microfinance & enterprises (VCO, snacks, biodegradable fiber bags); SRHR education (631 women; 732 students).	Women-led enterprises operating and scaling; tracked in SIRETA gender dashboard and village records.
8	6.1 / 6.2 / 6.6	Drinking water, sanitation, water-related ecosystems	WASH & water quality	20 drilled wells; 189 river latrines removed; 22 handwashing stations (schools/Posyandu).	Sustained WASH access in 12 villages; downstream water quality benefits; MoH/SIRETA reports.
9	7.b / 12.a	Installed renewable energy capacity	Community clean energy	29 solar panels in Tampelas; solar water system (Karuing); 16 guard posts solarized.	O&M of PV systems for community and productive use; district/SIRETA records.

10	8.3 / 8.5 / 8.8	Decent work, MSMEs, OSH	Decent jobs & safety	Formal employment across functions (fire prevention, restoration, biodiversity, logistics, R&D, STA); OHS system implemented; 0 fatal injuries (2020–2023).	Ongoing compliance with OHS (Law 13/2003), SOPs & periodic training; injury reduction; SIRETA traceability.
11	9.5	R&D and innovation	Applied peatland science	64 researchers; 31 collaborations; 8 MoUs with universities; satellite/analytics (OroraTech, Planet, FIRMS), AGB/biomass, GNSS/GEE/ArcGIS.	Continuous MRV improvement and applied science for peat restoration; active publications & agreements.
12	11.4	Natural & cultural heritage	Peat forest conservation	157,875 ha protected; culture/environment campaigns; alternative livelihoods to slash-and-burn.	Participatory management & ongoing campaigns; sustained ecosystem services.
13	12.8	Education for sustainable development	Environmental literacy	School & community programs (health, hygiene, waste); 287 staff trained on SDGs and SIRETA integration.	ESD modules embedded and replicable; institutional strengthening for continuous education.
14	13.2 / 13.3	NDC & climate awareness	Climate action & resilience	17,357,446 tCO ₂ e avoided (2021–2023); fire prevention with 33 villages, 2,028 people engaged; reforestation 1,661 ha + natural succession 55,363 ha (325,176 seedlings).	55,306,737 tCO ₂ e avoided; early warning & control aligned with NDC/RAN-GRK.

15	14.2	Ecosystem-based management of marine areas	Cleaner rivers/coasts	River latrine removal & waste education; peat restoration reduces runoff/nutrients to rivers.	Sustained reduction of land-based pollutants from catchments to coastal areas.
16	15.2 / 15.3 / 15.5 / 15.c	Sustainable forest mgmt., land degradation, species, wildlife trade	Forests & biodiversity	Active protection; restoration (see #14); hunting monitoring in 31 villages; livelihood transition (ex-loggers).	Ongoing restoration/monitoring; reduced poaching/traffic & habitat loss; stronger community governance.
17	16.6 / 16.7 / 16.10	Effective institutions & participation	Inclusive, transparent governance	904 community meetings (28,516 participants; majority women); 34 villages with MoUs; FPIC & GRM operating; external audits; public transparency.	Institutionalized participatory management; sustained grievance resolution; public information access.
18	17.9 / 17.16	Capacity-building & monitoring frameworks	Partnerships & SDG tracking	2,364 participants in community trainings (143 events); 2,544 in technical/SDG trainings; SIRETA as monitoring/budget framework.	Consolidated local capacities and SIRETA embedded as permanent SDG/MRV system.

2.2 Project Implementation Status

2.2.1 Implementation Schedule (VCS, 3.2; CCB, G1.9)

Ongoing Activities:

Ongoing activities during the monitoring period included reforestation and assisted natural regeneration; peatland rewetting, hydrological restoration, and peatland preservation; fire prevention, preparedness, awareness, and response measures; species and habitat protection, biodiversity monitoring, and hunting monitoring; participatory planning and community consultations; community development and livelihood support; promotion of sustainable energy solutions; promotion of sustainable agricultural practices; carbon stock monitoring, land cover change analysis, and related monitoring activities; and continued implementation of VCS/CCB project management, monitoring, and reporting requirements.

The following activities were continuously implemented during the current Monitoring Period, including those initiated in previous Monitoring Reports and maintained throughout 2020–2023:

- Agroforestry and sustainable agriculture practices
- Biodiversity Monitoring (camera traps, species tracking, habitat monitoring)
- Community development programs (Livelihoods, Microfinance, Social Forestry, BumDes)
- Education and Culture
- Fire prevention
- Forest protection and patrols
- Participatory planning and stakeholder engagement (FPIC processes)
- Public health and WASH programs
- Rewetting and hydrological restoration
- Reforestation and natural regeneration
- Renewable Energy
- Strengthening Local Institutions

These activities remain aligned with those described in previous Monitoring Reports and have continued to be implemented and expanded throughout the current Monitoring Period.

Milestones and Progress:

Period	Activity	Milestone
January 2020–December 2023	1. Agroforestry and sustainable agriculture practices	- Agroforestry demonstration plot (demplot) in Kampung Melayu: 5 ha - Peatland agroforestry (Teplag) in Serambut: 15 ha - Semi-intensive agroforestry with fruit crops: 830 farmers involved across Seranau, Pulau Hanaut, and Mendawai sub-districts (2021–2023) - TBTK, intensive management (horticulture): 48 farmers involved (2021–2022) - Further detail in the CCB & VCS MR7 (Version July 2025), Appendix 5, Section 2.3 and 2.4 (page 288-9)
January 2020–December 2023	2. Biodiversity Monitoring	Camera Trap Monitoring Equipment: 247 camera units maintained in total working order. Effort Duration: Total Trap Days: 70,449 Effective Trap Days: 51,448 Spatial Coverage: Sampling Blocks (80 sqkm): 6 blocks Grid Coverage: 120 grids (2x2 km) and 412 grids (1x1 km). Sampling Stations: 570 stations established. Transect Surveys Orangutan Population Study: Effort: 48 transects across 12 locations, covering 248 km on foot. Findings: 2,396 total nests detected (avg. 10 nests/km). General Fauna Study: Effort: 36 transects across 9 locations, covering 200 km on foot. Findings: 135 species detected from a total of 3,254 individual observations. Ad-hoc Observations: 146 additional species detected through non-systematic sightings. Survey Logistics & Personnel Manpower Effort: A total of 8,518 survey man-days.
January 2020–December 2023	3. Community development programs	Livelihoods intervention: 14 former illegal loggers between 2022 and 2023, in Pulau Hanaut Zone Microfinance: KSM Mendawai (10 women groups, 83 active members). KSM Mendawai Sejahtera is a women-led microfinance program in Mendawai Village, operating from 2018 to 2025. Since its reformation in 2017, it has been managed by local women and continues to operate as a community-based initiative. The program provides access to microloans, savings, and basic financial literacy support. These services help women support small income-generating activities, contribute to household needs, and support their children's education (section 2.3, page 288) Social Forestry: Supported 8 LPHDs under the social forestry scheme, including facilitation of 5 new forest management decrees (SK) in 2023. BumDes Sehati Serambut: Since 2022, BumDes Sehati Serambut has developed coconut oil and VCO production using local resources, creating

		opportunities for women and youth. The project supports this through training and mentoring. The BumDes is formally registered and continues to strengthen its management practices
January 2020–December 2023	4. Education and culture	• 241 adults in Kejar Paket, 40 certified, 78% women (CCB & VCS MR7 - July 2025, point 6, p. 22) • 2 river boat schools (point 6, p. 22) • 2 Agriculture Vocational School: SMK Mendawai and Amabarwati (section 4.4; p.293) • Five preschools across five villages support quality early education and healthy development through classroom improvements, teacher support, and learning materials. (CCB & VCS MR7 - July 2025, Point 4, p.293)
January 2020–December 2023	5. Fire Prevention	• Zero large-scale fire incidents recorded across 149,800 ha • Fire suppression and detection flow • Stockholm Environmental Institute Working Paper, Natural climate solutions and Fire Mitigation: Early findings on the path to net zero. Section 4.3 Effective fire management practices (page 28). For projects that have achieved fire-mitigation co-benefits, this third part presents the relative fire threat level and practices and resources for fire prevention, monitoring, and suppression. Among our six sample projects, only the Katingan Peatland Restoration Project (ID 1477) was found to have statistically significant results and demonstrable co-benefits. • Fire Mitigation Report 2023 • Community fire brigades: Training of 1,380 community members in fire prevention • Active Forest patrols
January 2020–December 2023	6. Forest protection	Continued protection of peat swamp forest habitat to prevent illegal logging and encroachment
January 2020–December 2023	7. Participatory Planning	• 208 community meetings conducted with 14,313 participants (77% women), strengthening inclusive decision-making. • 80 MoUs maintained with 34 villages and 5 sub-districts to support project implementation (See Evidence Folder Findings 1)
January 2020–December 2023	8. Public health and WASH programs	• Delivery of health services for 55 Posyandu in 34 villages; posyandu terapan (section 5, page 22); healthcare activities, health cadre training (CCB & VCS MR7 - July 2025, point 3, page 290) • WASH improvements across project villages (CCB & VCS MR7 - July 2025, section 6.2; page 299)
January 2020–December 2023	9. Rewetting	Construction of 34 canal blocks across key areas (Hantipan, Perigi, southern zones) to support hydrological restoration (CCB & VCS MR7 - July 2025, section 1, page 5)
January 2020–	10. Reforestation	Restore degraded forests and increase afforestation and reforestation (CCB & VCS MR7 - July 2025, section 15, page 312)

December 2023	n and natural regeneration	1,661 hectares of degraded land have been restored through planting since 2016. 55,363 hectares undergoing natural succession, aiding in the restoration of ecosystem functions. 671,523 seedlings planted since 2016 to regenerate and promote sustainable forest cover
2023	11. Renewable Energy	Installation of 29 solar panel systems in Tampelas villages for households and community facilities. Progress update in 2024-2025 (See Evidence Folder Findings 1)
January 2020–December 2023	12. Strengthening Local Institutional	List of Local Institution : LPHD, women’s groups, KSM, Posyandu, BumDes, STA (See Evidence Folder Findings 1)

Historical Implementation Progress (Context)

For contextual reference, project implementation has advanced through several phases:

- 2010–2020: Launch of core activities, including participatory planning, community development initiatives, and the establishment of monitoring systems.
- 2015–2020: Active participation in VCS and CCB validation, monitoring, and verification processes.
- 2020–2023: Consolidation and scaling of project activities, including baseline reassessment, methodological updates, and the expansion of community and ecosystem interventions.

Reporting on Loss of Carbon Stock:

There have been some carbon losses during the monitoring period due to illegal logging. We do not know specific dates on when the events occurred as they are small scale; they were discovered when performing the land cover change analysis (Section 3.1.3.3.1) for each year. Table 2.2 shows the details of the carbon stock losses for each year. The losses do not meet the definition of a loss event and/or reversal.

Methodological Updates and Implications for Comparability:

During this monitoring period, the project underwent a significant methodological update, including a baseline reassessment aligned with VM0007 v1.8, updates to the monitoring plan, and the adoption of wall-to-wall high-resolution biomass maps to improve accuracy and spatial

resolution of carbon stock estimates. These updates were made to ensure compliance with the latest best practices and regulatory requirements, reflecting new datasets, technologies, and national regulations affecting peatland management.

As a result of these updates, carbon accounting results from this monitoring period should not be directly compared to results from prior verification reports. The updated baseline and monitoring approach represent a methodological improvement that provides a more conservative and scientifically robust assessment of emissions reductions and removals.

Table 2.2 Loss of carbon stock details for the 2021-2023 monitoring period. Total Lost GHG Emissions (%) has been calculated as a percentage of the total emission reductions per year.

Year	Deforested Area (ha)	Deforested Area (%)	WRC GHG Emissions from Deforestation (tCO ₂)	REDD GHG Emissions from Deforestation (tCO ₂)	REDD GHG Emissions from Forest Degradation (tCO ₂)	Total Lost GHG Emissions (tCO ₂)	Total Lost GHG Emissions (%)
2021	137.5	0.092	299.07	44,314.22	40,277.70	84,891	1.31
2022	187.3	0.125	706.84	60,764.53	40,277.70	101,749	1.50
2023	137.1	0.092	1,178.19	44,270.90	40,277.70	85,727	1.23
Total	461.8	0.308	2,184.10	149,349.65	120,833.10	272,367	1.35

2.2.2 Baseline Reassessment (VCS, 3.2.6, 3.2.7)

Did the project undergo baseline reassessment during the monitoring period?

☒ Yes

☐ No

The latest version of VM0007, v1.8, has been applied for the baseline reassessment and monitoring report.

A whole new updated Project Description document has been produced to reflect all the changes. The whole Climate section of the PD has been updated; these are the sections with the most relevant changes:

- PD Section 3.1 has been updated using the latest remote sensing technology for the creation of the digital terrain model and the mapping of peat thickness, peat depletion time and above ground biomass.
- PD Section 3.2.2.1 outlines the new regulations impacting the baseline and how these have been implemented in the baseline model.
- PD Section 3.2.2.2 has been updated to calculate the new deforestation rate for this baseline period.
- PD Section 3.2.2.3 details the updated baseline stratification and model, implementing all the new datasets and regulations affecting the baseline.
- PD Section 3.2.2.4, 3.2.2.5 have been updated with the new baseline emissions.
- PD Section 3.2.3 has been updated with the implementations of the new datasets, project stratification and ex-ante project emissions.
- Section 3.2.4 has been updated with the new leakage calculations.
- Section 3.2.5 has been updated with the new VCUs estimations.
- Section 3.3 has the updated monitoring plan.
- Section 3.4 has been updated with the new climate change benefits analysis.

The baseline scenario is still valid, with a detailed justification in PD Section 3.1.4.

Table 2.3 summarises the new regulations impacting the baseline and PD Section 3.2.2.1 provides a detailed explanation on how these new regulations have impacted the updated baseline model.

Table 2.3 New regulations affecting the baseline model

Regulation	Year	Requirements
Ministry of Environment and Forestry Regulation P.10/MENLHK/SETJEN/KUM.1/3/2019	2019	This regulation is a technical implementing regulation of PP No. 57/2016 jo. PP No. 71/2014, issued pursuant to its provisions. It provides the water balance methodology (Darcy method) for delineating the peak of the peat dome (puncak kubah gambut) within each peat hydrological unit. Concession holders must delineate, protect, and restore (where already cleared or converted) the peat dome peak. The regulation operates within the peat ecosystem protection framework established by PP No. 57/2016 jo. PP No. 71/2014. The general forestry regulations (PP No. 23/2021 and MoEF Reg. P.8/2021) and the peat ecosystem regulations are harmonious; the peat-specific rules are actively reinforced within MoEF Reg. P.8/2021 (Sembiring & Ferdianza Legal Opinion, 23 April 2026, para 3 – Appendix 6 of the PD). The project has implemented the protection of the peat dome peak on its updated baseline model.
Directorate General of Sustainable Production Forest Management Regulation P.1/PHPL/SET/KUM.1/5/2020	2020	It establishes that holders of business permit for utilisation of timber forest products in production forests must implement a multi-business model for forestry. This means that permit holders must have more than one activity in the concession area. The baseline scenario meets this requirement.
Ministry of Environment and Forestry Regulation 8	2021	It requires the protection of riparian buffers: 200m for swamp rivers, 100m for large rivers and 50m from small rivers. The project has included these requirements in its updated baseline model.

2.2.3 Methodology Deviations (VCS, 3.20)

2.2.3.1 Deviation 1: Above Ground Biomass mapping

Deviation description

The existing VM0007 methodology recommends that above ground biomass is estimated based on field measurements in sample fixed area plots or sample points established across the project area to generate a representative sample of the forest biomass across ecological gradients and forest strata. The observed biomass values should then be averaged across the entire area for the relevant strata. This

plot averaging approach, where sampling is truly representative and a sufficient number of field plots exist, provides an effective way to estimate biomass stock and change across a large area. However, forests are highly dynamic in both space and time, undergoing continual change in response to complex ecological and anthropogenic processes. These processes often do not occur uniformly across large areas but rather they are heterogeneous, driving diverse spatiotemporal changes in forest biomass/structure.

Although Modules CP-AB and X-STR do not contemplate the use of more advanced technology than that available at the time of approval of said modules, page 13 of version 2.2 of M-REDD, in a footnote, states: *“For example, a multi-temporal set of remotely sensed data can be used to detect changes in the structure of the forest canopy. A variety of techniques, such as Spectral Mixture Analysis (Souza et al. 2005), SAR or LiDAR, can be used under this approach but no specific technology is prescribed here. Some of the newer technologies can estimate carbon contents of forest types, if supported by field information such as sample plots to calibrate the technology and fieldwork leading to allometric equations of key species. Project proponents must use techniques that are suitable to their specific situation and that have been published in peer-reviewed papers”*.

In order to account for variability in forest dynamics in both space and time, we have therefore followed the suggestion of the methodology by creating wall-to-wall high resolution biomass maps. This approach is now widely used and accepted in the scientific literature (Asner et al., 2018; Baccini & Asner, 2013; Jha et al., 2021; Johnson et al., 2022; Jucker et al., 2018). Therefore, these maps will be used to quantify and monitor aboveground biomass, including the monitoring of forest degradation and forest regrowth.

This approach uses the field-derived measurements of forest biomass combined with high-resolution Biomass and forest structure data provided by Chloris Geospatial (Chloris Geospatial, 2024). The Chloris data is designed to generate robust, spatially explicit estimates of biomass stock, change, and related carbon emissions and removals, with pixel-level quantified uncertainty. This approach also allows us to generate an updated biomass map for each year, therefore improving the frequency and accuracy of forest degradation and regrowth.

Demonstration of conservativeness

The locally-calibrated biomass model was validated using a rigorous spatial cross-validation framework designed to provide realistic estimates of predictive performance on spatially independent data. A repeated spatial disc cross-validation approach was used, with a disc radius of 1 km and a buffer of 3.5 km to exclude spatially correlated observations. This buffer exceeds the reported variogram range of 3.3 km for the KMP area (Pickstone, Graham, and Cunliffe 2025), ensuring that training and test data are spatially independent and that performance metrics are not inflated by spatial autocorrelation.

The cross-validation produced the following performance metrics (Figure 2.2):

- Mean bias: -2.32 Mg ha^{-1} . The model, on average, slightly underestimates aboveground biomass density relative to field-measured values. This means the biomass maps systematically attribute less carbon stock to the project area than direct field observations would indicate.
- R^2 : 0.82, indicating strong explanatory power across the range of biomass values observed in the KMP.
- RMSE: 29.62 Mg ha^{-1} , demonstrating overall predictive accuracy suitable for landscape-scale carbon accounting.

The bias is consistently negative across spatially independent cross-validation folds, and the cross-validation design (buffer exceeding the variogram range, i.e., the distance beyond which spatial correlation between observations is negligible) confirms this is not an artefact of spatial autocorrelation.

In addition, pixel-level prediction intervals were generated using a Jackknife+ conformal prediction approach (Barber et al., 2021), a distribution-free method that provides calibrated 90% prediction intervals for every pixel in the biomass map without assuming a particular error distribution. These uncertainty estimates are propagated through all downstream analyses, including change detection and degradation monitoring, ensuring that only statistically robust changes are reported. This pixel-level uncertainty quantification is not achievable under the prescribed plot-averaging approach, which can only provide a single confidence interval per stratum and offers no spatially explicit information about where estimates are more or less reliable within a given stratum.

The plot-averaging approach prescribed by Modules CP-AB and X-STR assumes that biomass is spatially homogeneous within strata. In the heterogeneous peat-swamp forests of the KMP, this assumption does not hold: biomass varies substantially over short distances due to differences in peat depth, hydrology, disturbance history, and forest type. The wall-to-wall mapping approach captures this spatial variability, providing a more accurate representation of biomass stocks and changes across the project area. Furthermore, the 94 field plots used for local calibration are not used in isolation; they calibrate a model that integrates approximately 94,000 GEDI spaceborne LiDAR shots, Chloris global biomass products, and multi-sensor Earth Observation data, substantially extending the information base beyond what plot-averaging alone could achieve.

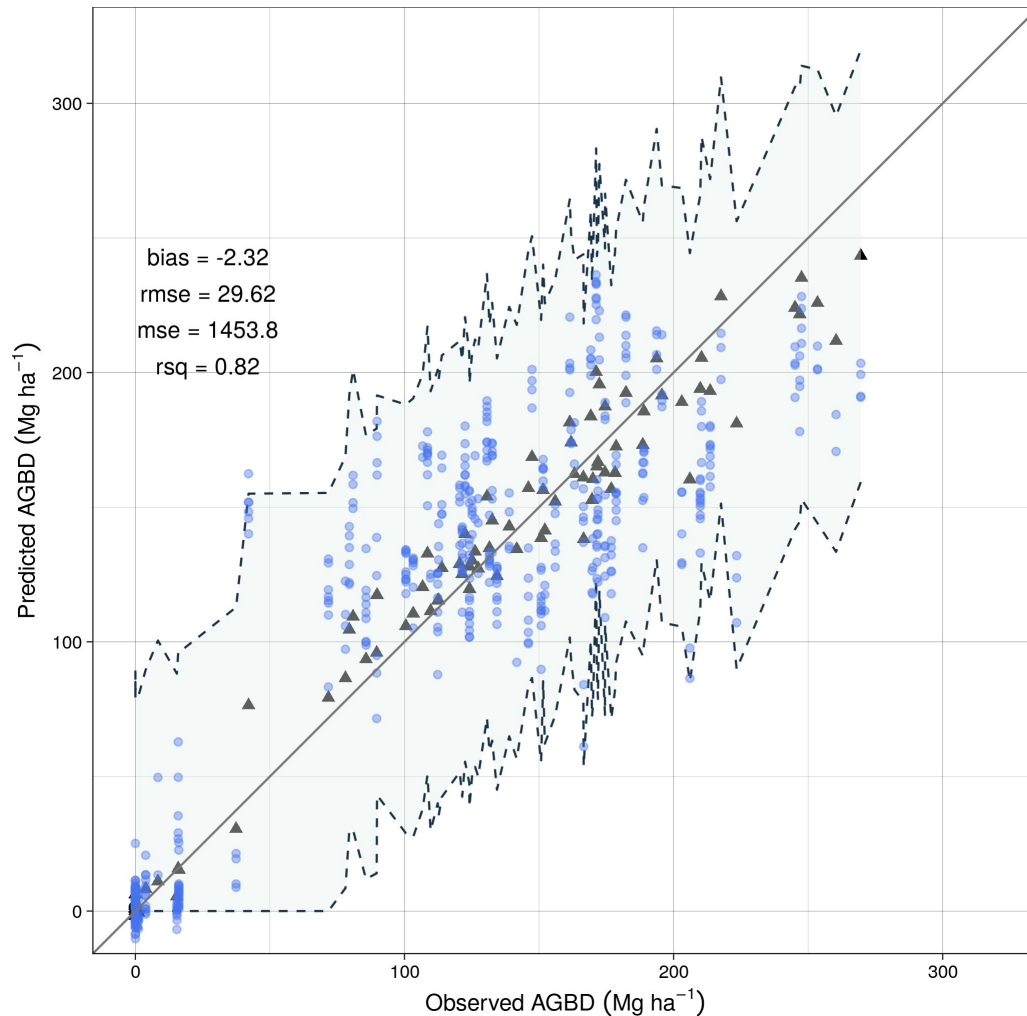


Figure 2.2 Spatial cross-validation results for the local biomass model. Blue points show hold-out predictions from spatial cross-validation folds; black triangles show predictions from the full model. The solid grey line is the 1:1 line; dashed grey lines show the 90% prediction intervals. The negative mean bias (-2.32 Mg ha⁻¹) confirms that the model systematically underestimates biomass relative to field observations.

The cross-validation confirms that this deviation does not negatively impact the conservativeness of the quantification of GHG emission reductions. The model's mean bias of -2.32 Mg ha⁻¹ demonstrates that biomass is systematically underestimated relative to field observations, meaning the project consistently claims less carbon stock than is measured on the ground. The approach provides a more accurate and spatially explicit estimation of biomass stocks than the prescribed plot-averaging approach, while maintaining this systematic conservative tendency. Please refer to the Climate Annex for complete details of the validation framework and results.

2.2.3.2 Deviation 2: Degradation Monitoring

Deviation Description

The project will not use the Participatory Rural Appraisal (PRA) method from M-REDD to delineate the area subject to degradation ($ADegW,i$), but delineate that buffer by measuring the distance to the areas of detected illegal logging from the closest access point. These areas of deforestation are detected by the land cover analysis which is performed each year using high resolution multispectral data, specifically PlanetLab's PSB.SD imagery. Using this area is more conservative since the distance to the detected illegal logging in previous years was significantly larger than the distance that the PRA results showed (Table 2.4). The degradation within this area will be directly measured using biomass maps as described in Section 3.1.3.3.2.

Table 2.4. Comparison between the distance resulted from the PRA in previous years versus the distance to the detected illegal logged areas from the nearest access point on the same year.

Year	PRA Distance Result (m)	Illegal Logging Distance (m)
2015	300	828.56
2017	350	327.86
2019	283	685.86

The degradation happening within $ADegW,i$ will be measured using the aboveground biomass maps.

Conservativeness of the Degradation Monitoring Approach

In the monitoring period, quantified degradation within the project area represents emissions against the project: higher monitored degradation results in fewer emission reductions being claimed. The relevant conservativeness test is therefore whether the deviation could risk understating actual anthropogenic degradation, which would inflate claimed emission reductions. The approach ensures this does not occur, while preventing natural biomass dynamics from being incorrectly attributed to anthropogenic degradation.

Separation of anthropogenic and natural biomass change

The project is not required to account for natural disturbance, which is typically balanced by local regrowth near sites of natural disturbance, but only for human-induced carbon losses such as those resulting from illegal logging. However, when measuring degradation using the aboveground biomass loss maps, all carbon losses are detected and differentiation between natural and anthropogenic degradation is not directly possible from the maps alone. To address this, the project measures degradation both in the area subject to degradation (the buffer zone around access points, where human-driven degradation is concentrated) and in non-accessible interior areas, where changes reflect natural dynamics. The average carbon loss per hectare in the non-accessible area is calculated and deducted from the degradation detected in the area subject to degradation, thereby isolating the component attributable to illegal logging and other human activities.

This spatial control approach ensures the accuracy and reliability of the degradation estimate:

- Natural biomass changes (e.g., from drought, El Niño events, natural tree mortality, or continued forest growth) affect both the accessible buffer zone and the non-accessible interior areas. By subtracting the interior rate from the buffer zone rate, these natural dynamics are appropriately excluded from the anthropogenic degradation estimate.
- The approach cannot systematically understate anthropogenic degradation: all biomass losses within the buffer zone are captured by the complete spatial coverage of the maps, and only the natural background component (as measured across the full interior area) is removed.
- The prescribed stump-survey approach (VMD0015, Section 5.2.3) quantifies degradation by measuring the diameters of tree stumps found within sample transects covering a minimum of 3% of the buffer area, and scaling these measurements to the full area. At this sampling intensity, across a degradation buffer of 52,660.9 ha, the probability of any given transect intersecting a specific logging site is low, and localised extraction events may be missed entirely. The resulting estimate is then extrapolated from this sparse sample to the full buffer area, introducing substantial scaling uncertainty. Additionally, the stump-survey approach provides no equivalent mechanism for controlling for natural background losses. The biomass mapping approach eliminates this sampling limitation by providing complete coverage of the entire degradation zone at annual frequency, ensuring that no degradation event is missed due to insufficient spatial sampling.

Statistical rigour in change detection

The change detection framework applies several filters to the biomass time series to ensure reported degradation reflects genuine biomass loss rather than prediction noise (see Climate Annex for full details):

1. P-value adjustment: The temporal trend (slope) for each pixel is adjusted by multiplying by (1 - p-value), reducing the magnitude of changes that are not statistically distinguishable from noise. Non-significant trends are effectively reduced to zero.
2. Negative-only threshold: Only negative biomass changes (losses) are retained in the final analysis. Any apparent biomass gains are excluded, ensuring the analysis is focused on degradation only.
3. Uncertainty-weighted regression: The temporal regression is weighted by the inverse of the prediction interval width, meaning that years with higher prediction uncertainty contribute less to the trend estimate.

Combined with the complete spatial coverage described above, these statistical safeguards represent a significant improvement over the prescribed stump-survey approach, which incorporates no equivalent mechanisms for filtering noise or controlling for natural variation. The stump-survey method's reliance on sparse spatial sampling and extrapolation introduces a real risk of both over and under-estimating degradation depending on whether transects happen to intersect logging sites, whereas the biomass mapping approach measures the entire degradation zone directly and retains only statistically significant changes.

Area Delineation

The use of objectively detected illegal logging distance rather than PRA results to delineate ADEG_{W,i} provides an evidence-based, verifiable determination of the area subject to degradation. The illegal logging distance in the majority of previous monitoring periods was larger than the PRA-derived distance (Table 2.4), resulting in a larger monitoring area. Within the monitoring context, a larger degradation buffer means more area is assessed for degradation, and any degradation detected within this larger area is counted as emissions against the project. The approach therefore does not reduce the area in which degradation is monitored.

Robustness to model bias

The biomass model underpinning the degradation analysis has a demonstrated mean bias of -2.32 Mg ha⁻¹ under spatial cross-validation (see Deviation 1 above and the Climate Annex). Because the same model is applied consistently across both the buffer zone and the interior control area, any systematic bias cancels out in the subtraction used to isolate anthropogenic degradation. The anthropogenic degradation estimate is therefore robust to model-level biases.

Summary

This deviation does not negatively impact the conservativeness of the quantification of GHG emission reductions or carbon dioxide removals. The approach provides comprehensive spatial coverage of the degradation zone (compared to 3% coverage under the prescribed stump-survey method), a systematic control for natural biomass dynamics (absent from the prescribed method), and multiple statistical

safeguards that guard against the underestimation of anthropogenic degradation. It increases the accuracy of degradation monitoring relative to the prescribed stump-survey approach while improving conservativeness.

2.2.4 Minor Changes to Project Description (CCB Program Rules, 3.5.6)

During this monitoring period, several adjustments were made to improve project effectiveness without requiring a deviation from the validated Project Description. These included expanding community livelihood programmes to additional villages within the project zone, introducing women-led microfinance groups, and revising training approaches to integrate more practical agroecology modules. On the biodiversity side, monitoring protocols were strengthened by deploying additional camera traps and revising species lists in line with the latest IUCN Red List updates. Canal-blocking methods were refined to improve peatland rewetting outcomes.

All modifications were made to enhance project outcomes and remain fully consistent with the Climate, Community & Biodiversity Standards criteria and indicators. These changes are captured in the most recent PD which includes the revision of the baseline and it is fully consistent with the MR. No changes resulted in adverse community or biodiversity impacts, and all activities continue to contribute directly to the project's validated climate, community, and biodiversity objectives.

2.2.5 Project Description Deviations (VCS, 3.21; CCB Program Rules, 3.5.7 – 3.5.10)

During the baseline renewal process an updated PD was produced; several changes from the original PD were implemented and they carry over to this and future MRs:

1. **Afforestation and Reforestation (ARR) removal:** ARR has been removed as a project activity because VM0007 can no longer be used for ARR. In the original PD, 4,227 hectares of non-forest areas were designated for ARR activities, with the intention of claiming emissions reductions (ERRs) in subsequent verification events. During the first baseline period, 1,152.18 hectares were replanted. However, since the project never claimed ERRs in any monitoring report (MR), removing this project activity has no accounting consequences. Notably, although ARR will no longer be included in ERR accounting, field activities will continue—new areas will be replanted each year and all replanted areas will remain maintained and monitored. The original ARR crediting area has been retained within the WRC crediting area where the two areas overlapped and has been completely removed from calculations in areas where they did not overlap (e.g., areas with no peat). None of the original ARR areas has been included in the REDD crediting area.

2. **Eligible area for REDD crediting:** The eligible area for REDD crediting decreased from 114,689.64 hectares in the original PD to 106,715.24 hectares in the updated PD. This reduction results from an increase in the protected area in the baseline scenario, reflecting the application of new regulations. Detailed explanations of the regulations and new baseline conservation areas are provided in Sections **Error! Reference source not found.**, **Error! Reference source not found.** and **Error! Reference source not found.** of this document, and Sections 3 and 5 in the Climate Annex.
3. **Eligible area for WRC crediting:** The eligible area for WRC crediting increased from 127,713 hectares in the original PD to 129,395.86 hectares in the updated PD, representing a 1.4% increase. Several changes were implemented in the baseline modelling and ERR estimation during baseline renewal, which could have influenced the WRC area:
 - a. Updated DTM and Peat Thickness map produced with the most up-to-date technology (see Sections **Error! Reference source not found.** and **Error! Reference source not found.**)
 - b. Updated conservation area and riparian buffers in the baseline scenario, reflecting new regulatory requirements (see Sections **Error! Reference source not found.**, **Error! Reference source not found.** and **Error! Reference source not found.** of this document, and Sections 3 and 5 in the Climate Annex).
 - c. Updated fire analysis for the baseline scenario (see Section **Error! Reference source not found.** and Section 6 of the Climate Annex).
 - d. Updated waterbodies in the PA and updated drainage buffers in the project scenario (see Sections **Error! Reference source not found.** and **Error! Reference source not found.**).
4. **Exclusion of DOC from WRC accounting:** Accounting for DOC requires applying emission factors to all waterbody catchment areas (Prijac et al., 2022). Although DOC was included in the original PD, it has been excluded in this baseline renewal. Delineating catchment areas in the baseline scenario proves impractical due to the extensive network of ditches on the peatland. Consequently, the project conservatively excludes off-site emissions from waterbodies. This approach is justified because the baseline scenario contains significantly more ditches than the project scenario—meaning that excluding these emissions biases the comparison against the baseline, where they would be larger. Emissions from waterbodies are accounted for as on-site CO₂ and CH₄ emissions; for on-site emissions the emission factors are applied to the area of waterbodies. See Section **Error! Reference source not found.** and Climate Annex Section 8.2 for more information on emissions from water bodies and their associated emission factors.

2.2.6 Grouped Projects (VCS, 3.6; CCB, G1.13-G1.15, G4.1)

This is not a group project.

2.2.6.1 New Project Areas and Communities (VCS, 3.6; CCB, G1.13)

During this monitoring period (2020–2023), no new communities were added to the Katingan Mentaya Project beyond the 34 villages originally identified and engaged during the validation phase. These villages, located across the Mendawai, Kamipang, and Bengkurung sub-districts of Katingan District, and the Seranau and Pulau Hanaut sub-districts of Kotawaringin Timur District, remain the primary stakeholders and beneficiaries of project activities.

2.2.6.2 Removed Project Areas and Communities (CCB, G1.13)

N/A

2.2.6.3 Eligibility Criteria for Grouped Projects (VCS, 3.6.14; CCB, G1.14)

N/A

2.2.6.4 Risk Mitigation for Grouped Projects (VCS, 3.6; CCB, G1.15)

N/A

2.2.6.5 Project Zone Map (CCB, G1.13)

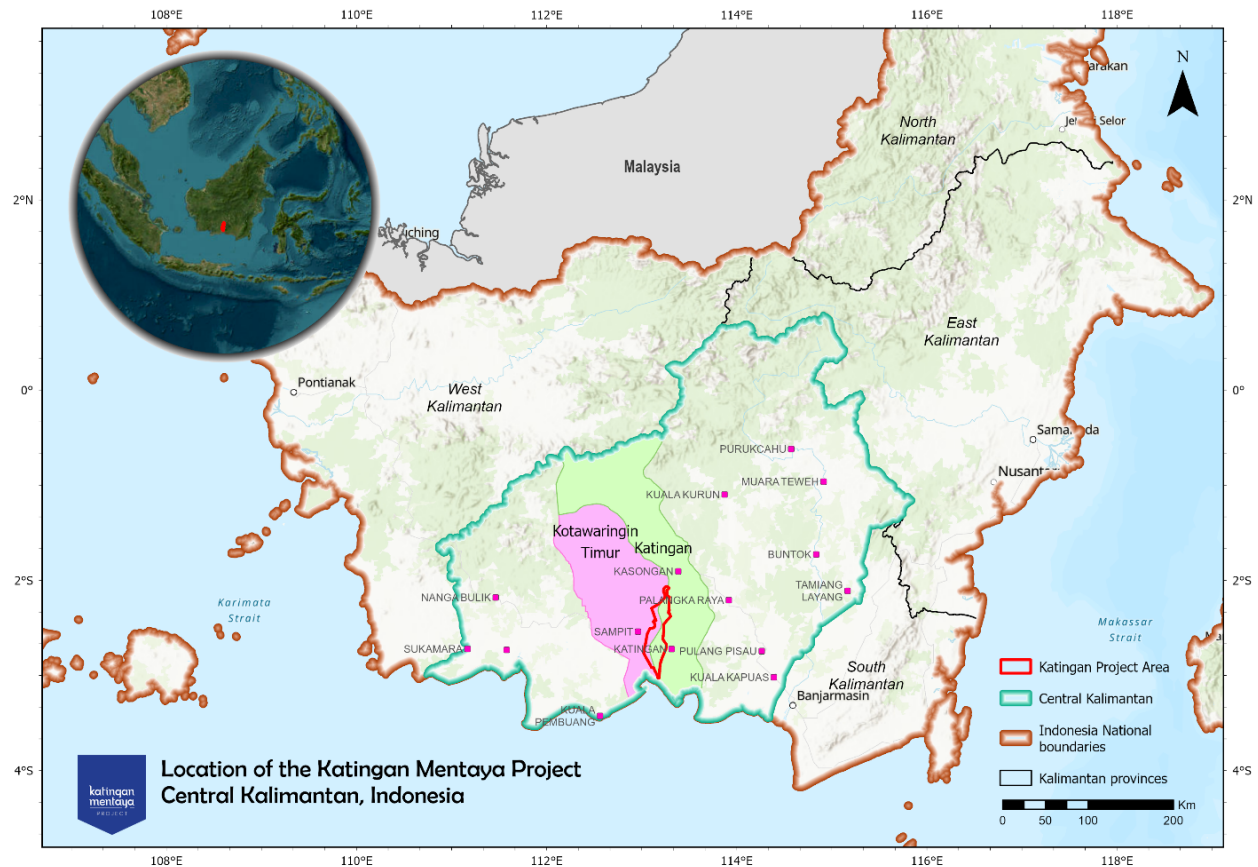


Figure 2.3. Location of the Katingan Mentaya Project in Kalimantan, Indonesia.

2.2.6.6 Changes to Management (CCB, G4.1)

The project has undergone significant restructuring to enhance implementation efficiency and effectiveness, particularly through the incorporation of zone heads into the management hierarchy. This restructuring aligns roles and responsibilities more closely with project objectives and improves coordination across all functional areas.

Integration of Zone Heads:

- The project is divided into six zones, corresponding to sub-district administrative areas.
- Zone heads oversee field activities, including forest patrol, fire prevention, forest restoration (revegetation), rewetting, and community development.

- Responsibilities include employee safety, stakeholder grievance resolution, and collaboration with technical managers in hydrology, forest restoration, protection, and community development.

Enhanced Management Roles:

- Health, Safety, and Environmental (HSE) Manager: Ensures employee safety and minimises environmental impact.
- Human Resources (HR) Manager: Promotes equitable treatment and oversees staff development.
- Procurement Manager: Guarantees vendor services meet quality and efficiency standards, ensuring alignment with project objectives.

Collaborative Restructuring Process:

- The new organisational framework was developed through a participatory, bottom-up process.
- It was finalised and approved by the board of directors and will be presented to all employees during the annual meeting.

Project Governance Structures

The governance structure is designed to support effective project design and implementation through clearly defined roles and responsibilities:

Technical Managers:

- Specialise in hydrology, forest restoration, protection, community development, and biodiversity.
- Collaborate with zone heads to execute technical activities effectively.

Support-Related Managers:

- Oversee logistics, health, safety, and human resources.
- Address cross-functional challenges to streamline operations.

Stakeholder Engagement:

- Promotes inclusivity through consultations with local communities, government agencies, NGOs, and private sector entities.

Annual Review and Accountability:

- Regular reporting and feedback mechanisms ensure transparency and alignment with project objectives.

Required Technical Skills**a. Forest Restoration:**

- Ecological Knowledge: Understanding ecosystems, biodiversity, and forest succession processes
- Reforestation Techniques: Expertise in nursery management, seed collection, and tree propagation
- GIS and Remote Sensing: Mapping and monitoring restoration activities.

b. Hydrology:

- Water Dynamics Knowledge: Understanding precipitation, runoff, and watershed management
- Modelling and Analysis: Use of hydrological models and GIS tools
- Data Collection: Statistical analysis for groundwater and streamflow data.

c. Community Engagement:

- Participatory Methods: Engaging communities in project activities
- Conflict Resolution: Negotiating and resolving disputes effectively
- Cultural Sensitivity: Fluency in local languages and norms.

d. Botanist and Biodiversity Assessment:

- Taxonomy and Ecology: Identifying flora and fauna, understanding ecosystem functions
- GIS and Data Analysis: Mapping and statistical interpretation of biodiversity data.

e. Carbon Measurement and Monitoring:

- Forest Carbon Stock Assessment: Field measurements and carbon modelling
- Remote Sensing Expertise: Use of LiDAR and satellite imagery for large-scale monitoring
- Reporting: Preparing certification reports aligned with standards like VCS.

f. Policy and Legal Expertise:

- Environmental Law: Understanding frameworks for REDD+ and carbon trade
- Land Rights Knowledge: Navigating land tenure systems and indigenous rights
- Compliance: Aligning project activities with national and international guidelines.

g. Crosscutting Skills:

- Stakeholder Engagement: Building partnerships with relevant entities
- Sustainability Practices: Ensuring project resilience to climate change
- Monitoring and Evaluation: Designing systems to track performance
- Communication: Delivering clear, impactful reports and presentations.

2.2.7 Risks to the Project (CCB, G1.10)

Identified Risk	Potential impact of risk on climate, community and/or biodiversity benefits	Actions needed and designed to mitigate the risk
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Biodiversity loss (habitat degradation/fragmentation)	Loss of carbon sequestration capacity, degradation of ecosystem services, and disruption of climate regulation due to biodiversity loss	Species conservation and habitat management activities were implemented, including local people's involvement in biodiversity surveys. Illegal logging and poaching prevention activities were also implemented, including community involvement, training and operational support for illegal loggers and poachers to shift livelihoods, and socialization/consultation activities. Reforestation activities and social forestry facilitation, including patrols, surveys, socialization, and trainings, also contributed to habitat protection and restoration.
Soil degradation and erosion	Increased greenhouse gas emissions from soil degradation, loss of community livelihoods due to declining agricultural productivity	Agroforestry activities were implemented, including STA farmer school, demonstration plots, farmer training/workshops, and zero burning / zero chemical farming socialization. Reforestation activities were implemented through local involvement, socialization, and training. Rewetting activities were also implemented through local involvement and socialization, contributing to peat and soil restoration.
Water scarcity and watershed stress	Depletion of water resources affecting communities and ecosystems; potential loss of aquatic biodiversity	Rewetting activities were implemented with local community involvement and socialization to support hydrological restoration and peatland water retention. Water, sanitation and hygiene activities were also implemented, including installation of sanitary facilities and clean water for communities, as well as WASH socialization and consultation.

Wildfire risk	Increased risk of carbon stock loss due to wildfires; threat to community safety and ecosystems	Fire prevention and fire fighting activities were implemented, including local involvement in fire prevention and fire fighting, fire prevention socialization and coordination events, and training/workshops. Agroforestry activities promoted zero burning / zero chemical farming practices. Rewetting activities also contributed to reducing fire risk in peatland areas.
Pest and disease outbreaks (agriculture/forests)	Decrease in agricultural yields and food security; potential ecosystem imbalance	Agroforestry and sustainable agriculture activities were implemented, including STA farmer school, farmer training/workshops, zero burning / zero chemical farming socialization, and agroforestry demonstration plots. Livestock training/workshops and socialization were implemented, along with NTFP training for local farmers and handcrafters. These activities support more resilient agricultural and livelihood systems, although explicit integrated pest management or disease-resistant species were not specifically identified in the activity table.
Extreme weather and climate variability	Increased exposure to extreme events leading to community displacement and ecosystem degradation	Rewetting, reforestation, fire prevention and fire fighting, agroforestry, zero burning / zero chemical practices, WASH clean water installations, and renewable energy socialization/installation activities were implemented. Together, these activities strengthen ecosystem resilience, reduce vulnerability to drought and fire, and support community resilience.

Land tenure and access conflicts	Disruption in community land access and conflicts over resource use, leading to unsustainable land practices	Participatory planning activities were implemented, including MoU, village maps, workplan, PD/MR socialization and consultation, grievance cases, and signed MoUs. Social forestry facilitation activities were implemented, including patrols/surveys, socialization, trainings, and MoU/permit-related activities. Stakeholder engagement was also implemented with sub-district, district, provincial, national, and other institutions, together with strengthening of local institutions training.
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2.2.8 Benefit Permanence (CCB, G1.11)

The Katingan Mentaya Project has taken various measures to ensure the maintenance and enhancement of climate, community, and biodiversity benefits up to and beyond its project lifetime. These measures include:

- **Long-term Concession Licence:** The project is based on a 60-year concession license, extendable to 90 years. This long-term commitment ensures that the forest and peatlands in the project area remain protected and that the benefits continue to accrue over an extended period.
- **Local management and staff, with programmes embedded in broader local economy:** The project is managed by and staffed with 100% Indonesian people, 90% of whom originate from the local area. As well as being a major local employer, the project is being developed to play an increasingly important role in supporting education, health, fire prevention and local business development, which will help ensure its local relevance long into the future.
- **Recognition of Global Importance:** PT RMU and its partner Permian Global have developed a far-reaching communications and marketing programme that has been designed to generate and maintain interest and support for the Katingan Mentaya Project to ensure its long-term survival.
- **Forest and Peatland Protection:** The project's primary objective is to protect and conserve the forest and peatlands. Efforts to maintain the effective protection status of these areas will continue, including preventing illegal logging, encroachment through patrols and satellite monitoring, along with other activities that threaten these ecosystems.
- **Restoration and Resilience:** The project has implemented measures to restore the hydrology and degraded areas within the project area. This restoration work not only helps sequester

more carbon but also makes the region more resilient to the threat of wildfires, which are a major concern in many peatland areas.

- **Community Empowerment:** Activities related to community benefits are designed to be managed by local communities themselves in the future. The goal is to build local capacity and self-sufficiency so that these communities can continue to benefit from the project without the need for external interventions.
- **Sustainable Land Use Example:** The Katingan Mentaya Project serves as an example of sustainable land use management in the region. By demonstrating the benefits of its practices, it aims to inspire and encourage wider adoption of sustainable land use practices in neighbouring areas, contributing to regional sustainability in terms of carbon emissions, biodiversity conservation, and community development.
- **Legal and policy compliance:** The project ensures that it remains fully compliant with all local and national regulatory requirements.
- **Education and Advocacy:** The project is also likely involved in education and advocacy efforts to promote sustainable land use and conservation practices beyond its immediate boundaries. This can include working with local governments, NGOs, and other stakeholders to promote sustainable practices in the wider region.
- **Monitoring and Reporting:** Regular monitoring and reporting on the project's impact on climate, community, and biodiversity are crucial to track progress and identify areas for improvement. The project should continue to provide transparency and accountability in its activities.

By implementing these measures, which took place during this monitoring period and will continue throughout the lifetime of the project, the Katingan Mentaya Project aims to ensure that its positive impacts on climate, community, and biodiversity extend well beyond its initial project timeline, contributing to a more sustainable and resilient future for the region.

2.3 Stakeholder Engagement & Safeguards

2.3.1 Stakeholder Identification (VCS, 3.18, 3.19; CCB, G1.5)

During the first decade of project implementation, the project collaborated with various stakeholders identified through an initial analysis conducted by the PUTER Foundation. This analysis, performed in 2014 in Katingan Regency, employed methods such as actor mapping, Participatory Rural Appraisal (PRA), and village profiling across 13 villages. In 2019, the project expanded to an additional 21 villages in East Kotawaringin Regency through Memoranda of Understanding (MoUs). By 2023, 34 villages had formalised their involvement in the project through MoUs with PT RMU.

In 2021, Katingan Mentaya Project transitioned from a centralised approach to a zone-based work area management system. This shift aimed to enhance decision-making efficiency by empowering zone managers to make decisions informed by the specific conditions in their zones, resulting in quicker, more contextually appropriate decisions.

The project implementation and zoning system facilitated broader stakeholder identification through various processes:

- Utilising official data from BPS (National Statistics Agency) and incorporating information from other sources, such as neighbouring companies.
- Engaging in both formal and informal discussions with communities and relevant bodies as project partners and beneficiaries, using methods like Focus Group Discussions (FGDs), MoUs, and PKK agreements, as well as addressing on-field issues.
- Identifying institutions, agencies, or groups relevant to project activities, understanding their roles, responsibilities, and authority at the zone level as stakeholders. Examples include Pos Yandu (integrated community health programme), Regu Siaga Api (firefighting group), KTH (Forest-Farmer Community Group), Karang Taruna (youth organisation), PKK (women's group), local customary institutions (Lembaga Adat), loggers and miners' groups, LPHD (Community Forest Management Unit), Puskesmas (local healthcare clinics), and relevant local agencies.
- Integrating the Free, Prior, and Informed Consent (FPIC) process into MoUs and PKK agreements through multilevel discussions and consultations within the community's social structure, including neighbourhood systems and existing community groups like women, youth, and elders. MoUs follow Standard Operating Procedures (SOPs) and a Facilitation Meeting Technical Guide.

Draft MoUs and PKK agreements are disseminated to residents to gather input on each article through a consultation process. Once an agreement is reached, the MoU and PKK documents are signed by the project and the village head, witnessed by the Village Consultative Board (BPD), religious figures, traditional leaders, community leaders, and youth and women's representatives. The agreement is acknowledged by the local sub-district head, and activities are monitored and evaluated on a quarterly basis.

Supporting documentation includes draft agreements, attendance lists, process notes, meeting minutes, photos, village proposals, budget plans (RAB), Village Development Programme Documents (RPJM Desa), Village Budget Plans (RKP Desa), financial and activity accountability reports, and beneficiary lists.

The MoU allows villagers to utilise non-timber forest products (such as honey, gemor, jelutung/pantung, rattan, fish, and others) within the PT-RMU concession in Katingan and East Kotawaringin, as long as this

does not violate the principles of ecosystem restoration and adheres to the laws and regulations outlined in Chapter II, Article 2 of the MoU and applicable legislation.

Stakeholder Identification and Analysis

Keep Satisfied National level: BPK RI, Kemenkeu, BPKM, APhi, Media, APhi, KADIN, NGOs, Media Provincial Government	Manage Closely National level: KLHK Province: Dishut Kehutanan, BPSKL, DLH Provinsi, BKSDA, BPHL, PUPR District: PemKab, DLH Kabupaten, Forkopimda (Forum Komunikasi Pimpinan Daerah – TNI, Polisi, Kejaksaan, Pengadilan), KPHP 29, KPHP 30, BPBD, Media, Manggala Agni, UD Galangan Kayu (logs trader). Sub-District: Lembaga Adat (Damang dan DAD); Community Health Care (Puskesmas); Communication Forum in sub-district (TNI, Polri, Kecamatan); school. Village level: KTH, Poktan, LPHD (community Forest), BumDes, PKK, Lembaga Adat, Posyandu, loggers, miners, pemburu liar, nelayan, water taxi, NTFP crafters, women’s KSM Groups, RSA/MPA, STA. Personal: Religious leader.
Monitor Universitas, BRIN Company (neighbourhood): PT Arjuna Utama Sawit, PT Ceria Karya Pranawa, PT Persada Era Agro Kencana, PT Pagatan Usaha Makmur, PT Borneo Sawit Perdana	Keep Informed National: Bappenas, BRGM, BKPM District: DPRD (Legislative), District Agency for Education, Healthcare, Agriculture, Dinas Koperasi dan UMKM, Kebudayaan, Pariwisata dan Ekonomi Kreatif, Disperindag. Village level: Ojek motor, Pondok Pesantren, Karang Taruna, teachers

2.3.2 Stakeholder Access to Project Documents (VCS, 3.18, 3.19; CCB, G3.1)

The Katingan Mentaya Project has worked to ensure transparency and inclusivity with all its stakeholder engagement by ensuring that all project documentation is both available and accessible through the translation into local languages. Project documents are provided in both

the Indonesian language and English, acknowledging the linguistic diversity of the stakeholders. The project has worked to address accessibility challenges by catering to those with visual impairments and to communities with limited internet access. For the former, documents are made available in formats conducive to their needs, while the latter benefit from physical copies and various other distribution mechanisms that are thoughtfully deployed to bridge the connectivity gap.

2.3.3 Dissemination of Summary Project Documents (VCS, 3.18, 3.19; CCB, G3.1)

The dissemination of summary project documentation and monitoring results to communities is done through a well-structured and inclusive process, focusing on transparency and accessibility. Here's a detailed description of how this is actively done:

- **Preparation of Summaries:** Summaries of the PD and Monitoring Reports are created in both English and Indonesian languages to ensure accessibility to a broader audience. These summaries are designed to be concise yet comprehensive, providing key information about the project's objectives, activities, and environmental and social impacts.
- **Translation in Indonesian Language:** Recognising the importance of reaching local stakeholders effectively, the summaries are translated into the Indonesian language. This step was crucial in making the information more understandable and relevant to the communities directly affected by the project.
- **Stakeholder Engagement:** The summaries are shared with local stakeholders, including community members, NGOs, government agencies, and other relevant parties. These stakeholders are actively encouraged to provide their comments and feedback on the project documentation and monitoring results.
- **Public Comment Period:** A public comment period is established to allow for a wider range of individuals, including the general public, to review and comment on the summaries. Both the English and Indonesian versions are made available during this period to ensure inclusivity.
- **Online Accessibility:** The summaries are published on the project's website and the Standard setter's project registry website. This online platform provided access to summaries for anyone interested in reviewing and providing feedback.
- **Communication Channels:** To reach a wider audience, various communication channels are utilised, such as local community meetings, social media, email newsletters, and community bulletin boards. These channels are used to inform the communities about the availability of the summaries and the public comment period.
- **Community Workshops:** In addition to online dissemination, community workshops and information sessions are organised to present the summaries and answer questions from

community members. These face-to-face interactions help in clarifying any doubts and ensuring that local communities had a platform to voice their concerns or suggestions.

- **Feedback Collection:** Throughout the dissemination process, feedback mechanisms are established to collect comments and suggestions from stakeholders. These mechanisms included online forms, email addresses, and designated contact persons who can receive feedback directly.
- **Periodic Updates:** Regular updates are provided to the communities and the public about the progress of the project and any changes made based on the feedback received. This helps maintain transparency and build trust among stakeholders.

By following this comprehensive approach to disseminating summary project documentation and monitoring results, the project ensures that local communities and the wider public have the opportunity to participate in the decision-making process and contribute their insights and concerns, ultimately fostering a more inclusive and accountable project implementation.

2.3.4 Informational Meetings with Stakeholders (VCS, 3.18, 3.19; CCB, G3.1)

Between 2020 and 2023, a total of 904 informational meetings with stakeholders were conducted in relation with project activities, attended by 28,516 people (60% female). These meetings played an important role in fostering collaboration between diverse stakeholders, from local communities to technical experts, with the aim of addressing challenges related to land management, agricultural development, and conservation efforts.

A Year-by-Year Breakdown:

- In 2020, the project held 78 meetings focused on project activities, the planning and implementation of MoU/PKK collaboration, and socialisation on village mapping. These processes contributed to the signing of MoUs/PKKs between villages and RMU
- In 2021, there were 217 meetings, which informed strategic planning for land rehabilitation and sustainable farming practices. These early conversations set the tone for the coming years, focusing on technical coordination and planning for future interventions.
- In 2022, there were 242 meetings. Topics ranged from areas of monitoring, education, and socialisation, ensuring that more communities were informed and involved in the decision-making processes that directly impacted their lands and livelihoods.
- In 2023, there were 367 meetings. During 2023, the meetings included technical workshops and discussions on the practical application of tools for data-driven agricultural management.

Diverse Topics and Engagement:

Throughout this three-year span, the meetings covered an array of topics that addressed both the immediate needs of communities and the long-term goals of sustainability. During these meetings the themes covered included land rehabilitation, agricultural innovation, and technical coordination. Each meeting served as a platform to exchange knowledge, align on best practices, and make collective decisions that would guide the future of sustainable land use. Whether discussing the rehabilitation of critical lands, coordinating planting schedules, or training communities on data management tools, the meetings consistently aimed to balance environmental protection with agricultural productivity. From the 143 meetings focused on monitoring ongoing projects, to the 84 meetings dedicated to socialisation efforts, each engagement brought a critical element to the overarching strategy of land and resource management.

In addition to monitoring and socialisation, key activities included counselling sessions, technical classes, and the signing of agreements to formalise partnerships. Whether through focus group discussions, coordination meetings, or community workshops, these engagements were designed to foster a collaborative atmosphere to encourage local participation and created pathways for sustainable development.

Empowering Communities:

A defining feature of these meetings was the direct engagement with 375 unique communities and villages. These communities were not passive recipients of information but active participants in discussions on issues such as agricultural rehabilitation, the application of data management technologies, and the overall enhancement of land use practices.

By equipping communities with the knowledge and tools they need to sustainably manage their resources, the meetings fostered a sense of ownership and responsibility among local stakeholders. This community-centred approach ensured that the interventions were not only technically sound but also socially inclusive and locally relevant.

Announcement methods:

Meeting preparation began with coordination with village authorities to agree on the purpose, venue, participants, and relevant stakeholders for each meeting. Invitations were then distributed at least three days in advance and included the date, time, location, objectives, and agenda. To promote broad and inclusive participation, invitations were delivered through both written and verbal channels using locally appropriate communication practices. Women were specifically invited through community groups such as PKK and Posyandu, as well as through wider community outreach.

2.3.5 Risks from the Project and No Net Harm (VCS, 3.18, 3.19)

See Annex 2.

2.3.6 Community Costs, Risks, and Benefits (CCB, G3.2)

During consultations with communities, efforts have been made to ensure that adequate, understandable, honest, and accurate information is provided as a basis for any decisions, including information on costs, risks and benefits. This process includes:

- A written Standard Operating Procedure (SOP) that all project staff must follow when working with local communities. This document describes the need to ensure any information is presented in a form that can be fully understood and in a timely manner to allow consideration, together with guidelines as to how that should be achieved. A copy of the SOP is available on the project database.
- During the development of all written agreements, on average, 1-2 months were allocated to allow each village time to discuss internally, raise questions, seek clarification, and amend the draft agreement. This iterative process is evidenced by a comparison of early drafts of each agreement, written notes of feedback from each community, and the revised final agreements.
- The project has offered and accepted requests from prospective villages to visit other project zone villages where activities have already been conducted in order to understand the nature of collaboration more clearly. This has allowed villages to directly raise questions to members of those villages about the project.

2.3.7 Information to Stakeholder on Verification Process (VCS, 3.18.6, 3.19; CCB, G3.3)

The process for verification by an independent validation/verification body involves several activities and communication methods to ensure that communities and other stakeholders are informed and engaged. Here is a description of these activities and methods:

To ensure that communities and stakeholders are well informed and actively involved, the project uses a variety of methods to communicate the verification process carried out by an independent verification body. These methods include:

- **Formal Meetings:**

Held at sub-district and village offices, these meetings invite key stakeholders—including village heads, community leaders, religious and cultural groups, farmer groups, women's groups, Posyandu representatives, persons with disabilities, the elderly, and other direct beneficiaries. The meetings

include presentations, interactive discussions, and Q&A sessions to explain the verification process and gather community feedback.

- **Informal Meetings and Direct Communication:**

The project maintains a stakeholder list and conducts direct outreach to marginalized individuals or groups who may not attend formal meetings, ensuring they also receive the information.

Communication is supported by zone offices located in the villages, which play a key role in community engagement, development, and handling feedback or concerns.

- **Direct Communication via Village Representatives:**

Local representatives serve as liaisons between the community and the project team. They are responsible for sharing updates, answering questions, and forwarding community input to project management.

- **Printed Materials:**

Project updates and verification documents—both full and summary versions—are printed in Bahasa Indonesia and distributed to community members and village governments. Communities are encouraged to read these materials and provide feedback ahead of the audit visit.

- **Village Planning and Evaluation Meetings:**

These regular meetings serve as a forum for two-way communication between project staff and the community. They are used to discuss project progress, explain the verification process, and collect feedback.

- **Feedback Mechanisms:**

The project provides accessible channels for community members to share input, such as through zone offices or designated contact persons. These mechanisms help ensure that community voices are acknowledged and considered in the verification process.

- **Audit Visit Notification:**

The schedule for external audit visits is communicated to the community well in advance, giving them time to prepare and participate if they wish.

2.3.8 Site Visit Information and Opportunities to Communicate with Auditor (VCS, 3.18.6, 3.19; CCB, G3.3)

Pre-Visit Communication

Notification of Visit: Village communities are proactively informed about upcoming visits by external verification auditors. This includes specific details such as the dates and times of the visit. The notification process is designed to be timely, ensuring that communities have adequate advance notice.

Encouragement for Direct Interaction: Communities are encouraged to engage directly with the auditors. They are informed that they have the freedom to speak openly and directly to the auditors, allowing them to express their views and opinions about the project without any intermediaries.

Information on Alternative Communication Channels:

Grievance Process: Communities are informed about the grievance process, providing them an avenue to submit written comments or complaints.

CCB Website and Public Comment Period: Information is also provided on how to engage through the CCB website, particularly during public comment periods, offering another channel for expressing their views.

During the Site Visit

Scheduling Independent Interactions: During the field visit, project staff play a crucial role in facilitating the interaction between the communities and the auditors. They help in scheduling times for the communities to meet with the auditors independently, ensuring that these interactions occur without the presence of project staff. This arrangement is critical for maintaining the independence and confidentiality of the communication between the auditors and the communities.

Facilitation of Direct and Independent Communication: The arrangement for private meetings between the auditors and community members is a key aspect of the process. This approach ensures that the communication is direct and uninfluenced, allowing community members to freely express their views, concerns, and suggestions regarding the project.

Post-Visit Communication

While not explicitly mentioned in the provided information, it is also essential to consider post-visit communication strategies, such as:

Feedback Sharing: Informing the communities about the outcomes of the visit and any actions taken as a result of their input.

Ongoing Engagement: Maintaining channels for continuous communication and feedback even after the site visit, ensuring long-term engagement and responsiveness to community needs and concerns.

2.3.9 Stakeholder Consultation (VCS, 3.18; CCB, G3.4)

The following sample meeting data demonstrates the integration of stakeholder and community consultations into the project design. Meetings are categorised based on the project's main activities,

providing clear examples of how feedback from these engagements has influenced project planning and implementation.

Table of Stakeholder consultation

Ongoing consultation	<i>Coordination of the STA programme collaboration plan at SMKN 1 Kamipang under the Agroforestry/Sustainable Agriculture theme, as part of ongoing engagement with educational institutions to promote sustainable practices.</i>
Date(s) of stakeholder consultation	<i>13-Jan-20</i>
Communication of monitored results	<i>Project goals and agroforestry education outcomes were presented and discussed with the school. Updates were shared through coordination meetings and documented in SIRETA to inform further collaboration.</i>
Consultation records	<i>Documented under SIRETA ID 8896 (#pmdh2020 #smkn1kamipang #sta). Includes meeting photos, attendance list, and notes. Input by Suandri.</i>
Stakeholder input	<i>SMKN 1 Kamipang expressed strong support and submitted a detailed proposal that became the basis for drafting an MoU to formalize collaboration on non-burning and no-chemical agricultural practices.</i>

Ongoing consultation	<i>Coordination meeting with PKK women of Seragam Jaya Village at the Mentaya Sweet production house to discuss local business development and enhance pineapple-based production activities.</i>
Date(s) of stakeholder consultation	<i>11-Feb-21</i>
Communication of monitored results	<i>Results of livelihood programmes and women's economic initiatives were shared during the meeting. Progress was also reported via SIRETA and village coordination channels.</i>
Consultation records	<i>Documented under SIRETA ID 2601218543, input by Sundari. Includes minutes, photos, and attendance list (7 participants: 2 men, 5 women).</i>

Stakeholder input	<i>The group expressed strong interest in implementing the proposed activities, highlighting the need for alternative income sources. Feedback informed the design of women-led microenterprise support.</i>
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Ongoing consultation	<i>Discussion on preparations for semi-intensive land rehabilitation and pineapple cultivation, combining community initiatives with project support for sustainable agriculture.</i>
Date(s) of stakeholder consultation	<i>3-Jun-21</i>
Communication of monitored results	<i>Shared progress on rehabilitation planning and community training activities. Follow-up actions and results were documented in SIRETA and discussed in community coordination meetings.</i>
Consultation records	<i>Recorded under SIRETA ID 2601218845, input by Firmansyah Fazri. Includes attendance list (14 men, 1 woman), FGD notes, and documentation photos.</i>
Stakeholder input	<i>Participants requested technical assistance and capacity-building to strengthen self-reliance. The project scheduled follow-up training in response.</i>

Ongoing consultation	<i>Discussion with local customary institutions and Posyandu cadres on managing the Mentaya Seberang demonstration plots to enhance local engagement and coordination.</i>
Date(s) of stakeholder consultation	<i>16-Dec-22</i>
Communication of monitored results	<i>Presented progress on demonstration plot design, management structure, and mentoring schedules. Results shared via SIRETA and local follow-up meetings.</i>

Consultation records	<i>SIRETA ID 2601225185; coordinated by Saiful Anwar and led by Nurul Aulia Hasanah. Includes attendance list (9 men, 3 women), notes, and photos.</i>
Stakeholder input	<i>Participants expressed strong interest and confirmed community-led implementation. Activity design was refined to include local customary and health representatives.</i>

Ongoing consultation	<i>One-day socialisation event on forest and land fire (Karhutla) prevention and mitigation involving multiple local stakeholders to enhance preparedness and collaboration.</i>
Date(s) of stakeholder consultation	<i>23-Aug-23</i>
Communication of monitored results	<i>Shared results on fire prevention achievements, monitoring coverage, and community patrol coordination. Updates recorded in SIRETA and shared through sub-district coordination meetings.</i>
Consultation records	<i>SIRETA ID 2601228591; coordinated by Boby Irawan. Attendance: 40 participants (34 men, 6 women). Includes meeting notes, photos, and attendance list.</i>
Stakeholder input	<i>Stakeholders emphasized the importance of joint coordination among communities, government, and private actors. Their feedback informed the refinement of KMP's fire-prevention and response strategy.</i>

Key Focus Areas of Consultations

The consultations with communities within the project zone focused on 16 key subjects, aligned with the project's theory of change and community Monitoring, Reporting, and Verification (MRV) frameworks.

From 2020 - 2023, 904 consultation meetings were conducted, with an average attendance rate of more than 30 community members, 60% of whom were female. These meetings facilitated discussions, consultations, and socialisation efforts around the following focus areas:

- Agroforestry

- Aquaculture and Sustainable Fishery
- Fire Prevention and Firefighting
- Gender Equality, Disability, and Social Inclusion (GEDSI) Mainstreaming
- Illegal Logging and Poaching Prevention
- Livestock Management
- Non-Timber Forest Products (NTFPs)
- Participatory Planning
- Public Health
- Reforestation
- Renewable Energy
- Rewetting of Degraded Areas
- Small and Medium Enterprises (SMEs)
- Social Forestry Facilitation
- Stakeholder Engagement
- Water, Sanitation, and Hygiene (WASH)

Documentation and Evidence Tracking

All stakeholder and community meetings were recorded in the SIRETA project database. This database includes:

A detailed list of meetings categorised by topic, with the number of meetings conducted and participants involved.

Supporting evidence such as meeting minutes, attendance lists, photographs, and other documentation.

Unique SIRETA tracking numbers for each meeting, enabling easy verification and review.

2.3.10 Continued Consultation and Adaptive Management (VCS, 3.18; CCB, G3.4)

Since the inception of the Katingan Mentaya Project, ongoing communication and consultation with communities and stakeholders have remained central to its implementation strategy. PT RMU uses a multi-channel engagement approach to ensure that stakeholder voices inform project activities and adaptive management decisions. The project's stakeholder engagement framework includes:

- Quarterly facilitation and coordination meetings at the village and sub-district level
- Annual Musyawarah Desa (village consensus meetings) involving women, youth, customary, and religious leaders
- Mobile zone teams and zone heads facilitating two-way dialogue and regular updates
- Use of local languages and culturally appropriate consultation practices

- Grievance redress mechanisms embedded in every zone, including formal complaint channels and informal feedback loops
- Monitoring and Evaluation (M&E) reports and SIRETA dashboard used to transparently track progress and share feedback outcomes

Stakeholder input is documented, analysed, and used in project steering decisions. Input has directly influenced design updates in community development programmes, fire prevention training, gender inclusion initiatives, and adaptive planning for infrastructure funds (Dana MoU).

Summary of comments received	Actions taken
Request for prioritising local recruitment from Telaga Village	Telaga prioritised as a target village; recruitment remains open and fair across 34 villages
Request to raise daily fees for casual workers	Request forwarded to PT RMU Management for review
Concern over assignment of non-local guards at Bakumin Post	PT RMU explained prior hiring issues; will now coordinate with local community (Tumbang Bulan) for future staffing
Concern over aid distribution via sub-district government (flood response)	PT RMU followed government instructions; feedback was documented for future reference
Hantipan community felt excluded from project activities	PT RMU clarified activities are limited due to lack of MoU with village; ongoing efforts to expand inclusion
Complaint about missing customary institution funds	Funds were channelled through village heads with documentation and BPD oversight
Request for clean water in Handil Sasuai	Artesian well failed; water tanks were distributed in early 2024 to fulfill the original commitment
Concern over unpleasant odour from basecamp waste in Terantang	Waste system fixed after complaint was received
Complaint from Suparman (RSA head) about not being consulted	PT RMU apologised and committed to involving him in future worker selection

Input on microfinance scheme structure and payment process	Feedback incorporated into M&E of microfinance programme and design adjustments
Aquaculture practices and location suitability raised by communities	Local knowledge informed the design of fishery interventions
Feedback on water scarcity and sanitation linked to seawater intrusion and waste	Led to WASH interventions adapted to context and awareness campaigns
Request for improved educational access and learning materials	Inputs incorporated into updated educational modules and school partnerships
Demand for support in SME development (capital, training, marketing)	Incorporated into the PKK programme's livelihood initiatives
Desire for more involvement in fire prevention and team roles	Adjusted patrol frequency, clarified team roles, and trained local brigades
Feedback on ecotourism development potential	Villages included in KMP's ecotourism assessment and planning process
Suggestion for fairer benefit-sharing in agroforestry and land preparation	Used to co-develop revised guidelines on species selection and land use planning
Inputs on rewetting participation and canal block location	Community members hired for construction; local input shaped site selection
Requests for fire hazard mitigation in remote zones	Logistics and equipment improved; new fire brigades and training deployed
Input from schools to integrate local context in curriculum	Co-developed environmental education modules piloted in schools

2.3.11 Stakeholder Consultation Channels (CCB, G3.5)

The project strategically engaged in consultations and participatory processes, ensuring direct involvement with communities, stakeholders, and their legitimate representatives. This approach was tailored to maximise relevance and accessibility of information sharing. Here's an overview of the methods employed:

- **Issue-Specific Targeted Consultations:** The project's consultation strategy was designed to be issue-specific, ensuring that the right stakeholders were engaged for each matter. For

instance, broad community-wide consultations were conducted for overarching issues like the project's work plan, guaranteeing inclusive participation.

- **Engagement through Village Administration:** At the community level, the project employed formal presentations to village administrations. This step was crucial in disseminating key information to local leaders, who then acted as conduits to the wider community. This method effectively bridged the gap between the project and community members.
- **Widespread Information Dissemination:** Following presentations to village leaders, the project implemented broader dissemination strategies. This ensured that all community members, including those not linked to the village administration, received the necessary information, enhancing accessibility and inclusiveness.
- **Focused Group Involvement:** The project recognised the importance of engaging specific groups, such as village enterprise collectives, related to issues. This targeted approach allowed nuanced consultations and feedback from these key stakeholders.
- **Transparent Documentation:** A hallmark of the project's commitment to transparency was the comprehensive documentation of all meetings and consultations. This record-keeping, including attendance sheets and minutes, provided a transparent account of engagement efforts and stakeholder interactions.
- **Accessible Information Database:** To further aid information sharing, the project maintained a detailed database of all events and consultations. This resource offered stakeholders continuous access to project-related information, ensuring ongoing and open communication.

During the 2020–2023 monitoring period, the project conducted extensive direct consultations with communities and stakeholders, totaling 904 community meetings (28,516 participants) and 208 participatory planning sessions (14,313 participants) across the 34 villages in the project zone. These consultations were facilitated through village administrations, community groups (PKK, LPHD, KTH, youth and customary organizations), and targeted thematic discussions on agroecology, social forestry, health, and fire prevention. Each meeting was recorded in the SIRETA database with attendance lists, photographs, and meeting minutes as verifiable evidence of participation. The participatory process ensured that community input directly informed project planning, implementation, and monitoring, demonstrating transparent and inclusive engagement throughout the reporting period.

2.3.12 Stakeholder Participation in Decision-Making and Implementation (VCS, 3.18, 3.19; CCB, G3.6)

During the 2020–2023 monitoring period, the Katingan Mentaya Project strengthened inclusive community participation through structured and responsive engagement processes. Consultations were not only opportunities for dialogue but also mechanisms for shaping decisions. Inputs gathered

from community and stakeholder meetings directly informed project priorities, guiding annual workplans, MoU fund allocations, and adjustments in field activities. For example, feedback from farmer groups led to expanded agroecology and non-burning training programmes; community safety discussions informed the formation of additional fire-prevention patrol teams; and recommendations from women's groups resulted in new microfinance opportunities and health outreach activities. The project's participatory model integrates both formal and informal consultation spaces. Formal village meetings and participatory planning sessions ensure representation in decision-making, while informal gatherings in homes or community spaces encourage open dialogue and broader participation, especially among groups that might otherwise face logistical or social barriers. This flexibility ensures that feedback is continuous and that decisions remain grounded in local priorities. Gender sensitivity is embedded in all stages of participation. Dedicated women-only meetings and adjusted scheduling enabled women to engage fully and comfortably in consultations. As a result, women represented 38% of training participants and 21% of full-time project employment during this period. Their leadership has been instrumental in developing village-level microfinance schemes, health education campaigns, and sustainable livelihood initiatives. By ensuring that women's voices directly influence project design and implementation, the project promotes equitable participation and fosters shared ownership of outcomes.

Through this inclusive and adaptive approach, the project has demonstrated that community and gender-responsive consultation processes are not merely symbolic—they are integral to decision-making and the continuous refinement of project activities to reflect the aspirations and needs of the people it serves.

2.3.13 Anti-Discrimination Assurance (VCS, 3.19; CCB, G3.7)

To ensure that all entities involved in project design and implementation are not involved in or complicit in any form of discrimination or sexual harassment, PT RMU has implemented a comprehensive approach, as detailed in Section 2.3.15 and other related sections of their documentation. This approach can be broken down into several key activities and processes:

1. **Development and Approval of Staff Handbook:** PT RMU has collated and defined all employment terms into a Staff Handbook. This handbook is not merely an internal document but has been subjected to external review and approval by the Ministry of Manpower, ensuring its compliance with national laws and regulations. This step demonstrates due diligence in aligning the company's policies with legal standards.
2. **Distribution and Explanation of Staff Handbook:** The Staff Manual, once approved, was distributed to all staff members. This was accompanied by a detailed explanation of the contents, ensuring clarity, and understanding. This process is crucial for ensuring that all staff are aware of the policies and their implications.

3. **Active Confirmation of Understanding and Agreement:** All staff members were required to sign to indicate that they have received the manual and that they fully understand its contents. This requirement, in compliance with workforce regulations, ensures individual accountability and acknowledgment of the policies.
4. **Inclusion of Specific Sections on Harassment:** The staff manual includes a comprehensive section (Section XII) on harassment. This section explicitly defines and prohibits all forms of harassment, including but not limited to discrimination based on race, colour, religion, sex, age, sexual orientation, national origin or ancestry, disability, medical condition, marital status, veteran status, or any other protected status defined by law. It also specifically addresses and prohibits all forms of sexual harassment.
5. **Extension of Regulations Beyond Internal Staff:** The regulations concerning harassment are not limited to interactions among staff members but extend to all beneficiaries and counterparts of the project. This broad scope ensures that the policies are inclusive and protective of all individuals associated with the project.
6. **Availability of Full Company Regulation:** Full company regulation regarding these matters is made available upon request, promoting transparency and accessibility of information.
7. **Monitoring and Reporting Mechanisms:** To date, there have been no sanctions for infringement of these regulations, and no grievances of such nature have been reported. This suggests the effectiveness of the measures implemented. However, continuous monitoring and an open channel for reporting grievances are essential to maintain this record and address any issues promptly should they arise.

2.3.14 Grievances (VCS, 3.18.4; CCB, G3.8)

The project maintains a grievance redress mechanism to ensure that communities, workers, and other stakeholders are able to raise concerns, requests, or complaints throughout project implementation.

To ensure that the grievance procedure is easily accessible for ongoing consultation, the mechanism is embedded in the project's MoU and PKK (annual agreement), which define stakeholder rights, grievance procedures, and conflict resolution arrangements, including Chapter VIII (Rights and Obligations), Chapter IX (Grievance Mechanism), and Chapter X (Conflict Resolution). These agreements are discussed and signed by village leaders and representatives, including representatives of customary institutions, religious groups, women, youth, and the Village Treasury (BPD). The grievance mechanism is also regularly socialized through participatory planning processes and broader stakeholder engagement activities. Stakeholders may raise grievances through multiple channels, including field offices in each zone, local staff, community

meetings, and direct communication with project teams. The mechanism is designed to be culturally appropriate and inclusive, including for Indigenous Peoples, women, and vulnerable groups.

All grievances are recorded, tracked, and addressed through the established procedure. During the monitoring period, grievances were commonly submitted through verbal communication and routine consultation with project staff, after which they were documented and followed up through the formal grievance process. By 2023, grievance handling had been fully integrated into the Zone Management System, with the Head of Zone responsible for receiving, managing, and coordinating grievance follow-up and resolution. Records of grievances, actions taken, and resolution status are maintained in the project's documented GRM data and supporting records in the SIRETA system.

Between 2020 and 2023, the project recorded 38 grievances. Each case was reviewed and addressed on a case-by-case basis in accordance with the established procedure. The project reports that all 38 grievances were resolved, and supporting documentation was uploaded to the SIRETA system. Evidence supporting this section includes the Standard Operating Procedure for Grievance Handling and Conflict Resolution (SOP-PMDH-03-2022), the MoU and PKK (annual agreement), the project's documented GRM data, the Zone Management System records, the SIRETA system records, and the evidence folder containing grievance records and resolution documentation.

One grievance raised during the monitoring period concerned a request to increase daily fees for casual workers from PT RMU. This request was submitted through the established grievance and consultation channels and was escalated to Management for consideration. Following review, the daily wage was increased from IDR 100,000 to IDR 125,000 net as of early 2024, with food and transportation covered by the project. This matter was addressed through a structured and transparent process, taking into account financial sustainability and equitable treatment across communities. Supporting evidence includes the relevant grievance records, management records related to the wage adjustment, and associated documentation in the evidence folder.

With respect to former illegal loggers from Tatah Idak, the project discloses that support was provided through livelihood transition measures rather than compensation as a grievance settlement. Between 2022 and 2023, 13 individuals from Tatah Idak transitioned to alternative livelihood activities, including construction services, poultry farming, agriculture, fisheries, small business, barbershop services, water transportation services, and marine trading. This support formed part of the project's broader approach to community development and forest protection. Supporting evidence includes the relevant livelihood transition records, beneficiary and activity documentation, and associated materials in the evidence folder.

See below a summary of the grievances received and resolutions.

Grievances received	Resolution and outcome
PT RMU's recruitment should prioritise local people from Telaga village over Keruing, as Telaga is closer to the concession.	This grievance was reviewed through the established grievance procedure. PT RMU clarified that Telaga is one of the project's target villages and that local people from Telaga have participated in PT RMU activities, including recruitment. PT RMU further clarified that, as the project covers 34 villages, recruitment is conducted through a fair and open selection process across the project area.
Request to increase the daily fee for casual workers with PT RMU.	This grievance was reviewed through the established grievance procedure and has been resolved. PT RMU increased the daily fee for casual workers from IDR 100,000/day to IDR 125,000/day. The resolution was recorded in the grievance register and forms part of the project's grievance follow-up and labour compliance documentation.
Why were people from other villages placed to guard Bakumin Post when it's closer to Tumbang Bulan village?	A grievance was raised regarding the assignment of guards from other villages to Bakumin Post, which is located closer to Tumbang Bulan village. The matter was reviewed through the established grievance procedure. PT RMU clarified that recruitment had previously been attempted in Tumbang Bulan, but implementation challenges were encountered. As a follow-up measure, PT RMU committed to improving coordination with local representatives, including Pak Kadir, when casual workers are required from Tumbang Bulan village
Flood disaster assistance should have been given directly to the village instead of through the sub-district government.	PT RMU followed sub-district government instructions to distribute aid through the sub-district post. Feedback has been passed on for future consideration.
Community involvement in Hantipan for RMU activities has not reached all villagers and was subjective.	Due to the lack of an MoU, activities in Hantipan Village are limited. Collaboration is currently with villagers accustomed to working with RMU.
Customary officer did not receive funding for strengthening customary institutions.	Customary funds were sent through the village head and distributed with the knowledge of the Village Consultative Body (BPD) and customary officers.

Strengthening customary funds have not been distributed for three months by the customary coordinator.	Customary funds were sent through the village head and distributed as part of the 2023 evaluation process.
Illegal loggers from Tatah Idak have stopped logging and are waiting for compensation as agreed by PT RMU.	A grievance was raised regarding former illegal loggers from Tatah Idak. The matter was recorded and followed up through the established grievance procedure. During the monitoring period, the project response focused on supporting livelihood transition measures for the affected individuals, rather than documenting compensation payment under this MR period. Between 2022 and 2023, 13 individuals from Tatah Idak were supported to transition to alternative livelihood activities.
MoU between Batuah village and PT RMU was signed without prior discussion with the community, raising concerns about blocked rivers and lack of assistance.	The MoU was signed after discussions with village officials. PT RMU will not block natural rivers but only man-made canals, and PKK activities will be discussed within the village. PT RMU also provides assistance through proper proposals.
Complaints about irresponsiveness from the Batuah Village Government regarding local residents interested in business activities facilitated by PT RMU.	Residents can directly communicate with PT RMU's Community Development (Comdev) staff. Herman, as a community leader, can help facilitate communication between residents and Comdev staff.
Unpleasant odors from waste disposal at the PT RMU basecamp in Terantang village disturbed residents.	PT RMU apologises for the incident and has promptly fixed the waste disposal system.
Suparman, the new head of RSA, complained that PT RMU staff did not coordinate with him regarding casual worker selection for vegetation surveys.	PT RMU apologises for failing to coordinate with Suparman and promises to include him in future casual worker selection processes.
Residents of Handil Sasuai requested the provision of clean water equipment, as promised by PT RMU following	In 2021, the community agreed to the canal blockage plan in Sasuai, and PT RMU committed to providing clean water. An Artesian well was built but found unsuitable. In 2023,

the establishment of a canal blocking in Handil Sasuai.	PT RMU agreed to provide water tanks for rainwater, distributed in Feb 2024.
The local community in Handil Limin/Handil Kutuk claimed land in Handil Limin as their own by planting oil palm in the area.	This dispute was resolved through discussions mediated by village officials. PT RMU agreed to involve these individuals in reforestation activities in the area as part of the project's ongoing efforts.

2.3.15 Worker Training (VCS, 3.19; CCB, G3.9)

To ensure successful project implementation and effective community involvement, the Katingan Mentaya Project has developed a comprehensive orientation and training programme for new staff and community members. This programme has been designed with a dual focus: building skills and knowledge that are locally beneficial and preserving this knowledge to prevent loss through staff turnover. Here is an overview of the activities and processes that support this goal:

1. **Project Orientation:** Every new employee and relevant community member participates in an onboarding orientation. This session introduces the project's goals, the ecological significance of the tropical peatland ecosystem, and the roles of community members in restoration activities. This orientation also covers safety procedures and cultural awareness, enabling staff to contribute effectively and fostering a deep respect for local customs.
2. **Leadership Development:** Regular leadership development workshops and training sessions build management skills and prepare staff for greater responsibilities, establishing a pipeline for succession planning and career advancement. By developing leadership skills locally, the programme ensures continuity, as trained leaders can step into key roles when staff transitions occur.
3. **Carbon Monitoring, Reporting, and Verification (MRV):** Training in MRV is provided to both community members and employees, focusing on peat depth, biomass, and water level monitoring. Field and classroom-based training is complemented by the provision of necessary equipment. By involving local participants, this training creates a well-prepared MRV team that can sustain monitoring practices over time.
4. **Fire Prevention and Suppression:** Community members, local governments, and project staff receive training in fire management, covering risk assessment, resource mobilisation, and equipment usage. The outcome is a local firefighting team with access

to equipment and a well-organised communication network, empowering the community to handle fire-related incidents independently.

5. **Forest and Hydrology Restoration Training:** For restoration activities, training in ecosystem recovery, nursery operation, and canal blocking techniques is given to both employees and community members. Skills in these technical areas are vital for the project's long-term ecological goals, and the hands-on, field-based training ensures that community members can lead and sustain these efforts independently.
6. **Participatory Planning:** Training in participatory land-use mapping and village planning supports local governments and communities in defining their land-use priorities. This collaborative process ensures that local perspectives shape the project's implementation, fostering a sense of ownership and long-term commitment.
7. **Basic Skills and Conflict Mediation:** The project offers skill-building in areas like administration, finance, project management, and conflict mediation. These foundational skills are critical for effective project management and for handling community dynamics. This training empowers local participants to manage project operations efficiently and resolve conflicts constructively.
8. **Biodiversity Survey and Data Management:** Training in biodiversity survey methods enables community members to participate in documenting local flora and fauna, which helps build a sustainable local knowledge base. Additionally, training on data and knowledge management, including AI-based analysis, standard operating procedures (SOP), and storage systems, ensures that data collected remains accessible to future staff.

Through these programmes, the project builds a robust local skill base, ensuring that trained community members and employees can manage critical tasks independently. Furthermore, documented SOPs, digital data archives, and mentorship practices are used to ensure that knowledge transfer continues smoothly, even with staff turnover. In this way, the Katingan Mentaya Project sustains local capacity and strengthens community resilience, enabling continued project success and environmental stewardship beyond individual employment tenures.

2.3.16 Community Employment Opportunities (VCS, 3.19.13; CCB, G3.10)

The Katingan Mentaya Project is dedicated to investing in its people, focusing especially on those residing within the project zone, the broader region, and across Indonesia. In its recruitment practices, the project maintains a policy of non-discrimination, offering equal employment

opportunities to all, regardless of gender, age, social class, or ethnicity. Nevertheless, there's a preferential emphasis on hiring from within the project-zone communities.

To ensure fair and widespread access to job opportunities, the Katingan Mentaya Project employs diverse advertising strategies. Job openings are posted online on various job boards, announced in local villages and at Palangkaraya University, and shared through social media platforms.

Additionally, the project utilises local facilitators and field staff who visit all villages within the project zone to announce job vacancies. This approach allows for a comprehensive consultation process with the village government, focusing on the position's requirements and qualifications. Following this consultation, villagers who meet the job description and minimum requirements are recommended to the project team for consideration. This inclusive and community-focused recruitment strategy has been successful, as evidenced by the fact that over 74% of project field staff (amounting to 174 full-time equivalents) have been hired from within the project zone communities. This group constitutes 65% of the total project personnel, which includes 197 full-time equivalents, with women representing 13% of this workforce. All remaining staff members are recruited from other parts of Indonesia.

The Katingan Mentaya Project's approach to recruitment and employment ensures that staff or contractors, whether employed on a long-term or short-term basis, receive employment terms that are consistent with similar types of work and working conditions around employment. This commitment to equitable employment practices reflects the project's dedication to supporting local communities and fostering an inclusive work environment.

2.3.17 Occupational Safety Assessment (VCS, 3.19; CCB, G3.12)

Substantial risks to worker safety in the Katingan Mentaya Project have been thoroughly addressed through the implementation of a comprehensive Occupational Health and Safety (OHS) system.

Physical hazards from field activities such as fire suppression, environmental surveys, and water transport, compounded by the use of potentially hazardous equipment, and environmental dangers such as venomous insects, have been identified as key risks.

Activities Implemented to Inform Workers of Risks:

- A strong Health, Safety, and Environmental (HSE) management system was established, formalising over 40 Standard Operating Procedures (SOPs), including the Occupational Health, Safety, and Environmental Management System (RMU-MM-01) and Drug and Alcohol Abuse Policy (RMU-MM-02). These SOPs provide clear guidelines on managing safety risks.
- Workers undergo HSE inductions before the commencement of any activity, tailored to specific risks and updated with safety alerts regularly emailed to staff.
- Comprehensive safety training sessions cover hazard identification, evacuation procedures, equipment use, and survival techniques.

Minimisation of Risks:

- Adherence to SOPs ensures that risks are minimised. For example, RMU-MM-01 governs the overall management of health and safety risks, while the Drug and Alcohol Abuse Policy (RMU-MM-02) minimises risks related to impaired judgment.
- Workers are equipped with personal protective equipment (PPE), including microfibre masks, rubber boots, life jackets, and other specialised equipment for specific activities like fire suppression and water navigation.
- The buddy system ensures no worker is alone during potentially hazardous field operations, and tools such as GPS, compasses, and radios are provided to mitigate navigation risks.
- Monthly inspections of tools, vehicles, and field camps are conducted to identify and rectify safety concerns.
- Emergency response plans, including medical evacuations, are in place and regularly reviewed to ensure preparedness for accidents.
- By integrating formal SOPs and a rigorous safety culture, the Katingan Mentaya Project has successfully minimised workplace risks and continues to uphold a strong commitment to worker safety.
- Throughout the 2020–2023 monitoring period, the Katingan Mentaya Project ensured that all full-time employees were covered under Indonesia's national social security schemes, namely BPJS Ketenagakerjaan (employment insurance) and BPJS Kesehatan (health insurance). As of December 2023, a total of 163 staff members, including technical, administrative, and field personnel across all operational zones, were actively registered and covered. The insurance enrolment records confirm that every employee possesses valid BPJS-TK and BPJS-Kes membership numbers, guaranteeing access to health services, workplace injury protection, and retirement benefits. This measure demonstrates the project's commitment to occupational safety, social protection, and compliance with Indonesian labor regulations (Law No. 24/2011 and related provisions).

2.4 Management Capacity

2.4.1 Required Technical Skills (VCS, 3.19; CCB, G4.2)

The project activities described in the PD and in this Monitoring, Report have been and will continue to be implemented primarily by the project proponent, PT. RMU. The company employs a large, highly qualified, and professionally experienced staff drawn from various backgrounds and with expertise including forest management, peatland biogeochemistry, conservation biology, silviculture, agriculture, community development, financial management, business management,

communication, health and safety, legal and technical regulation, and policy. This team is based in headquarters in Bogor and Jakarta, within regional offices in Sampit, and throughout the project zone. Furthermore, local communities are also considered one of the key collaborating experts since they are the source of a wealth of local and traditional knowledge. The table below summarises some of the main project activity themes and the range of skills required for their implementation.

Project activity	Sub-project activity	Key skills required
Ecosystem restoration	Hydrology management; reforestation; enrichment planting; MRV	Hydrology; Carbon MRV, GIS/remote sensing; silviculture; peatland biogeochemistry
Forest resources conservation	Protection and enforcement; Forest fire prevention and control; Habitat conservation and management	HCV mapping, forest conservation; Peat forest fire management; biodiversity conservation, biodiversity MRV
Research and development	Knowledge management; MRV methods; restoration methods; biodiversity conservation methods	Carbon MRV, hydrology, silviculture, peatland biogeochemistry, forest conservation, biodiversity conservation
Livelihood development	Non-timber forest products, agroforestry, ecotourism	Community organising, conflict resolution, participatory land-use mapping, business management; Agroforestry, peatland biogeochemistry
Community resilience	Microfinance institutions and enterprises; Energy efficiency and production; Mother and child health care; Clean water and	Microfinance, community organising, conflict resolution, community organising

	sanitation; Basic education support	
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2.4.2 Management Team Experience (VCS, 3.19; CCB, G4.2)

The project's management team is composed of highly skilled and experienced professionals, each contributing a unique and essential skill set vital for the successful implementation of large-scale land management and carbon projects. The team's expertise and prior experiences are as follows:

- **Hydrology:** The team has experts in hydrology, a critical area for land management projects, especially in handling water resource management and mitigating flood risks.
- **Carbon Measurement, Reporting, and Verification (MRV):** Proficiency in carbon MRV is pivotal for the success of carbon projects. The team's ability to accurately measure, report, and verify carbon emissions and reductions ensures the project's credibility and effectiveness in carbon accounting.
- **GIS/Remote Sensing and Silviculture:** Expertise in Geographic Information Systems (GIS) and remote sensing enables precise land and resource mapping, essential for effective land management. The team's knowledge in silviculture underpins the sustainable management of forested areas.
- **Peatland Biogeochemistry and High Conservation Value (HCV) Mapping:** Specialised capabilities in peatland biogeochemistry and HCV mapping demonstrate the team's proficiency in managing sensitive ecological areas, crucial for maintaining ecological balance and preserving biodiversity.
- **Peat Forest Fire Management:** Experience in peat forest fire management is particularly relevant in preventing and mitigating the risks of forest fires, a common and severe threat in peatland areas.
- **Biodiversity Conservation and Monitoring (Biodiversity MRV):** The team excels in biodiversity conservation, both in preserving diverse ecosystems and monitoring and reporting biodiversity metrics, ensuring the protection and sustainability of biological resources.
- **Community Engagement Skills:** Strong skills in community engagement are evidenced through capabilities in community organising, conflict resolution, and participatory land-use mapping. These skills are crucial for ensuring community support and involvement in the project.
- **Decades of Cumulative Experience:** The collective experience of the team, spanning several decades, indicates their capability to handle complex projects efficiently and effectively. This experience has equipped the team with the knowledge to navigate the challenges inherent in large-scale environmental projects.

- **Transparency and Accountability:** The team maintains high standards of transparency and accountability, with detailed resumes of involved staff available for auditors' review upon request. This openness is key to building trust and credibility with stakeholders.

2.4.3 Project Management Partnerships/Team Development (VCS, 3.19; CCB, G4.2)

PT. RMU has strategically partnered with a variety of institutions to support the Katingan Mentaya Project, leveraging these collaborations to enhance the project's effectiveness and to ensure the highest level of expertise in various specialised fields. These partnerships play a crucial role, particularly in areas where in-house expertise may need supplementary support or where specialised knowledge is required. The nature and impact of these collaborations are as follows:

- **Range of Implementing Partners and Technical Advisors:** PT. RMU's collaboration with a diverse set of partners, including nationally and internationally recognised scientific and technical experts, provides access to advanced knowledge in climate science, community development, practical site management, and biodiversity conservation.
- **Issue-based and Ad Hoc Assistance:** The project benefits from issue-based or ad hoc assistance from these partners. This approach allows PT. RMU to draw on external expertise as and when specific issues or needs arise, ensuring that the project is supported by the most current and relevant advice.
- **Pro Bono and Contracted Consultants:** The mix of pro bono advice and contracted consultancy ensures a balance between cost-effective resource utilisation and the acquisition of high-quality, specialised services. This blend enhances the project's ability to address complex challenges effectively.
- **Enhancement of Wider Project Benefits:** The collaborations are not merely technical in nature but also aim to enhance the project's wider benefits. By making the site and its data open to new partners, the project fosters a collaborative environment conducive to innovation and comprehensive environmental stewardship.
- **No Identified Gaps in Core Project Capacity:** It is important to note that these collaborations have not been established to address specific gaps in the project's core activity capacity. To date, PT. RMU has not identified any such gaps, indicating a strong internal capability to implement the project's core activities.
- **Continual Monitoring and Gap Analysis:** While current collaborations fulfil the project's present needs, PT. RMU remains vigilant in continually assessing the project's execution. Should future validations or verifications identify any gaps, the organisation is prepared to respond either through recruitment strategies to enhance the in-house team or by extending partnerships to fill these specific needs.

2.4.4 Financial Health of Implementing Organisation(s) (CCB, G4.3)

The financial management plan and supporting evidence presented during the project validation remains the valid and functional financial management plan for the project. Project financing remains in place and secure, as demonstrated at the time of validation and subsequent verifications. Project expenses and financing during this monitoring period have remained as predicted. Detailed financial projections for the project include all project-related costs and ex-ante carbon estimates have been prepared. The financial projections are sensitive due to their potential impact on the project's competitive position and market value. These projections are available to the auditors upon request.

2.4.5 Avoidance of Corruption and Other Unethical Behavior (VCS, 3.19; CCB, G4.3)

The project proponent and all entities involved in the implementation of this project are fully committed to adhering to the highest standards of integrity and transparency. In alignment with the principles outlined in the "Kebijakan Anti Korupsi dan Gratifikasi 2024" policy, we unequivocally reject and take firm action against all forms of corruption, including bribery, embezzlement, fraud, favouritism, cronyism, nepotism, extortion, and collusion. This assurance is supported by a robust framework of policies, processes, and practices designed to prevent, detect, and address any unethical behaviour. The measures detailed below outline our commitment to ethical conduct and compliance with anti-corruption laws and regulations.

1. Declaration of Adherence to Anti-Corruption Policies

The project proponent and all associated entities are committed to upholding the principles outlined in the "Kebijakan Anti Korupsi dan Gratifikasi 2024" policy. This includes strict compliance with laws and regulations related to anti-corruption and the rejection of practices such as bribery, embezzlement, fraud, favouritism, cronyism, nepotism, extortion, and collusion.

2. Implementation of Transparent Processes

All financial transactions are recorded and audited to ensure there are no irregularities.

Procurement and hiring processes are conducted with transparency, using objective criteria to avoid favouritism or nepotism.

Periodic internal and external audits are conducted to assess compliance with anti-corruption standards.

3. Training and Awareness Programmes

Employees and stakeholders receive regular training on anti-corruption policies and ethical practices.

Communication channels are established to disseminate the anti-corruption policy and ensure awareness among all parties involved.

4. Whistleblowing Mechanism

A secure and anonymous whistleblowing system is in place to report suspected cases of corruption without fear of retaliation.

Reports are investigated thoroughly and appropriate actions are taken based on findings.

5. Monitoring and Evaluation

Anti-corruption measures are continuously monitored and evaluated to identify and mitigate risks of unethical behaviour.

Annual reviews are conducted to update policies and address new challenges.

6. Third-Party Due Diligence

Comprehensive due diligence is conducted on all contractors, vendors, and partners to ensure they adhere to anti-corruption policies.

Contracts include anti-corruption clauses obligating all parties to comply with the relevant standards.

7. Leadership and Accountability

Leadership is committed to setting an example of integrity and transparency.

Accountability measures are in place to ensure that any breaches of the anti-corruption policy are addressed promptly.

2.4.6 Commercially Sensitive Information (VCS, 3.5.2-3.5.4; CCB Program Rules, 3.5.13 – 3.5.14)

See Appendix 3

2.5 Legal Status and Property Rights

2.5.1 National and Local Laws (VCS, 3.1, 3.6, 3.7, 3.14, 3.18, 3.19; CCB, G5.6)

The Katingan Mentaya Project, an ecosystem restoration initiative in Indonesia, is committed to full compliance with national and regional laws governing forestry, environmental protection, carbon trading, and peatland management. Since the project's inception and subsequent validations, numerous laws have been enacted, revised, or reinforced to support sustainable land use, biodiversity conservation, and climate change mitigation. The project operates under the Forest Utilization Business Permit for ecosystem restoration, granted by the Ministry of Forestry

and updated through recent decrees, and aligns with the Republic of Indonesia's rigorous legal framework to ensure sustainable environmental and social practices. This document details the relevant laws affecting the project, recent updates, and compliance measures, providing transparency and assurance of its adherence to Indonesia's evolving environmental legislation.

1. General Environmental and Climate Change Laws

Law/Regulation	Description	Compliance Assurance
Law No. 6/1994	Ratification of UNFCCC	Full compliance with climate-related reporting and emissions management
Law No. 41/1999	Forestry Law	Adheres to forestry management and conservation standards
Law No. 5/1994	Ratification of the Convention on Biological Diversity	Ensures biodiversity conservation within project area
Law No. 32/2009	Environmental Protection and Management	Implements sustainable environmental protection measures

1. Forest and Land Use

Law/Regulation	Description	Compliance Assurance
Ministerial Decree No. P.70/2017	REDD+ Implementation Procedure	Follows all REDD+ guidelines for emissions reduction from deforestation and degradation
Ministry of Forestry Regulation P.56/2009	Business Planning for Ecosystem Restoration License	Business plan and operations are aligned with ecosystem restoration objectives
Government Regulation No. 26/2008	National Spatial Plan	Project location and activities align with spatial planning policies

2. Peatland Management

Law/Regulation	Description	Compliance Assurance
Presidential Instruction INPRES No.	Suspension on new licences in primary forests and peatlands	Project adheres to licensing requirements and primary

10/2011, updated by INPRES No. 7/2017		forest management regulations
Government Regulation No. 71/2014, revised by PP No. 57/2016	Peatland Protection and Management	Implements peatland management practices that maintain peat ecosystem health
Ministry of Environment and Forestry Decree P.16/2017	Technical Guidelines on Peat Ecosystem Restoration	Complies with technical requirements for restoration in peatlands within the project area

3. Carbon Trading and Economic Value of Carbon (NEK)

Law/Regulation	Description	Compliance Assurance
Presidential Regulation No. 98/2021	Carbon Economic Value Mechanisms	Integrates carbon economic value in project activities to meet NDC targets
Ministerial Regulation No. 7/2023	Carbon Trading Mechanisms	Project aligns with Indonesia's regulations on carbon trading practices
OJK No. 14/2023	Carbon Trading through Carbon Exchange	Participates in carbon exchange in compliance with Indonesian financial regulatory requirements
SRN PPI	Sistem Registri Nasional Pengendalian Perubahan Iklim – National Registry System for Climate Change Control	The project registry number is REG-11-PR-X-2025- 6737. This registry system ensures transparency and prevents double counting, meaning that even if voluntary credits are sold to international buyers, the emission reductions remain as Indonesian assets towards their NDC

4. Additional Forestry Regulations

Law/Regulation	Description	Compliance Assurance
Ministry of Forestry Regulation No. 39/2013	Community Development Programme	Provides community development aligned with forest partnership programmes
Ministry of Forestry Regulation No. 32/2014	Financial Reporting Guidelines for Production Forest	Maintains transparent financial records in accordance with ministry guidelines
Directorate General PHPL P.01/2020	Forestry Multi-Business Model for Concession Holders	Applies multi-business model to sustainably manage forest resources

Each law and regulation listed above has been integrated into the operational structure and compliance framework of the Katingan Mentaya Project, ensuring adherence to Indonesia's environmental and forestry laws.

2.5.2 Relevant Laws and Regulations Related to Worker's Rights (VCS, 3.18, 3.19; CCB, G3.11)

The project operates in full compliance with Indonesia's labour laws, setting an example for best practices in employment. Below is a breakdown of relevant labour laws, the company's compliance efforts, and the activities implemented to inform workers about their rights.

Relevant Laws and Regulations

Law/Regulation	Description
Labor Law No. 13 of 2003	Governs employment agreements, working hours, wages, paid leave, termination, discrimination, and grievance procedures.
Government Regulation No. 35 of 2021	Provides additional details and adjustments to employment terms and conditions as specified in the Labor Law.
Permenaker No. 18/2017	Outlines requirements for annual reporting of employment statistics to the Ministry of Manpower.

Social Security Laws (Laws 3/1992, 40/2004, and 4/2011)	Mandates registration for social security benefits, including BPJS Ketenagakerjaan (Employment Social Security) and BPJS Kesehatan (Health Social Security).
Omnibus law (Law No. 11/2020)	Enacted in November 2020 to streamline regulations and boost economic growth. It aims to create jobs by simplifying business licensing, attracting investment, and empowering micro, small, and medium enterprises (MSMEs)

Assurance of Compliance

Compliance Activity	Details
Labor Law No. 13 of 2003 & Gov. Reg. No. 35 of 2021	PT. RMU updated internal regulations in August 2023 to align with the latest amendments, approved by the East Kotawaringin Department of Labor. PT RMU implemented compensation arrangements for both permanent and casual workers through the approved Company Regulation Book, formal employment arrangements, documented payment procedures, and applicable worker benefits and social protection. Permanent workers received compensation and benefits in accordance with their employment terms, while casual workers received daily compensation in accordance with company procedures. Compensation-related concerns could be raised through the grievance mechanism and were reviewed through the established procedure. During the monitoring period, the daily labour fee for casual workers was increased from IDR 100,000/day to IDR 125,000/day.
Staff Handbook & Ministry of	The handbook detailing employment terms has been submitted to and approved by the Ministry of Manpower (valid for two years).

Manpower Approval	
Annual Reporting	PT. RMU reports employment statistics annually, ensuring transparency and compliance with Permenaker No. 18/2017 .
Grievance Process	A grievance process is included in the Staff Manual and project grievance mechanism. During the monitoring period, compensation-related concerns were raised and reviewed through the established procedure, including the request to increase the daily fee for casual workers, which resulted in an increase from IDR 100,000/day to IDR 125,000/day.
Social Security Compliance	PT. RMU registers all employees for BPJS Ketenagakerjaan and BPJS Kesehatan ; membership cards are issued to all employees.

Activities to inform workers about their rights

Activity	Description
Employee Handbook Distribution	The handbook, containing all relevant policies and regulations, is regularly updated and redistributed to all employees.
Socialisation Sessions	Regular sessions are conducted by management and HR to explain regulations, ensuring employees understand their rights and obligations under current laws.
Acknowledgment of Understanding	Employees are required to sign an acknowledgment form confirming they have received, read, and understood the Employee Handbook and Staff Manual.
Continuous Education	Continuous education and training programmes are provided to keep employees informed about updates or changes in labour laws and regulations.

Open Communication Channels	The company maintains open communication channels for employees to ask questions or seek clarification about their rights and company policies.
Regular Meetings and Feedback	Regular meetings and feedback sessions are held to address any employee concerns and improve workplace practices.

During the monitoring period, PT RMU implemented compensation arrangements for both permanent and casual workers in accordance with applicable company procedures and the relevant Indonesian labor framework, including Labor Law No. 13 of 2003 and Government Regulation No. 35 of 2021. Compensation-related concerns could be raised through the project grievance mechanism and were reviewed through the established procedure. In relation to the grievance regarding the daily fee for casual workers, PT RMU resolved the matter by increasing the daily labor fee from IDR 100,000/day to IDR 125,000/day. This demonstrates how compensation for casual workers was reviewed and adjusted during the monitoring period.

2.5.3 Human Rights (VCS, 3.19)

Project staff has undertaken various steps to recognise, respect, and promote the protection of the rights of Indigenous Peoples (IPs), Local Communities (LCs), and customary rights holders, aligning with international human rights law and the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP; United Nations, 2007), as well as ILO Convention 169 (International Labour Organization [ILO], 1989).

The project, managed by PT Rimba Makmur Utama in partnership with Permian Global and others, has been operating since 2010 and emphasises the interconnectedness of climate, biodiversity, and community development goals (Net Zero Group, n.d.). It has undertaken several initiatives to improve the well-being and livelihoods of local people, embedding environmental protection and sustainability across the region (CIFOR, n.d.). For instance, the project has implemented the Agroecology Farming Training Programme to help improve sustainability for local farmers, emphasising a no-burn, chemical-free farming approach. This demonstrates the project's commitment to sustainable practices that align with environmental and social goals (CIFOR, n.d.).

Furthermore, in terms of healthcare, the project collaborates with local officials to provide healthcare to remote villages, showing a commitment to improving the quality of life and well-

being of local communities. These services are often delivered via waterways due to the lack of road access, illustrating the project's adaptability to local conditions (CIFOR, n.d.).

The project also maintains a database called SIRETA, which tracks and assesses progress against the United Nations Sustainable Development Goals (SDGs). The data for this is collected from across the project as part of its annual audit under the Verra Verified Carbon Standard (VCS) and the Climate, Community, and Biodiversity Standard (CCB). This systematic data collection and assessment ensures transparency and accountability in the project's impact on local communities and the environment.

In terms of community engagement and development, the project facilitated the establishment of community rubber gardens and small-scale rattan businesses, as well as supporting credit union schemes and fisheries assistance in local villages. This approach has helped enhance community participation and ensure that local needs and rights are respected and integrated into the project's operations (CIFOR, n.d.).

While these efforts reflect the project's commitment to respecting and promoting the rights of IPs and LCs, challenges and complexities exist in implementing such large-scale projects. The dynamics of community engagement, land tenure, and local politics are areas that require continuous attention and sensitivity to the unique contexts of the communities involved (World Rainforest Movement [WRM], n.d.).

Overall, the Katingan Mentaya Project's approach to working with local communities and respecting their rights and customs, while also focusing on environmental conservation and sustainability, demonstrates a multifaceted strategy that aligns with international standards for their protection (CIFOR, n.d.)¹⁴.

¹⁴ Center for International Forestry Research (CIFOR). (n.d.). Katingan Peatland Restoration and Conservation Project, Central Kalimantan, Indonesia. Retrieved from CIFOR website.
International Labour Organization (ILO). (1989). C169 - Indigenous and Tribal Peoples Convention, 1989 (No. 169).
Net Zero Group. (n.d.). Katingan REDD+ Project. Retrieved from Net Zero Group website.
Permian Global. (2023). Katingan Mentaya Project, Indonesia's largest REDD+ initiative, delivering on all 17 SDGs. Retrieved from Permian Global website.
United Nations. (2007). United Nations Declaration on the Rights of Indigenous Peoples. Retrieved from the United Nations website.

2.5.4 Indigenous Peoples and Cultural Heritage (VCS, 3.18, 3.19)

The Katingan Mentaya Mentaya Project consistently demonstrates a sustained commitment to preserving and protecting cultural heritage as an integral part of its activities, aligning with the United Nations Sustainable Development Goals (SDGs; United Nations, 2015). Covering a 157,875-hectare peatland conservation area in Central Kalimantan, Indonesia, the project actively integrates cultural preservation with its broader goals of community development, climate mitigation, and biodiversity conservation (CIFOR, n.d.; Katingan Mentaya Project, n.d.). Central to the Katingan Mentaya Project's efforts is its continued engagement with local communities, ensuring that their cultural heritage and rights are respected and integrated into project planning and implementation. The project's participatory mapping initiatives are ongoing, fostering collaboration with Indigenous Peoples and Local Communities to recognise customary land rights and traditional practices. These mapping exercises, first implemented by Yayasan Puter and later expanded to additional villages, remain critical for clarifying village borders and land-use plans, promoting both environmental conservation and cultural preservation (Anaya, 2005; Xanthaki et al., 2017). This approach aligns with the principles outlined in the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP), particularly regarding FPIC (United Nations, 2007).

The project continues to support sustainable livelihoods that are intrinsically linked to the cultural practices of local communities. By maintaining programmes such as community rubber gardens and small-scale rattan businesses, the Katingan Mentaya Project enables economic activities that respect traditional knowledge and environmental values. These initiatives not only provide economic benefits but also reinforce the cultural identity of the communities by preserving their traditional craftsmanship and ecological harmony (Janke, 2009; United Nations, 2015).

Healthcare delivery remains a key aspect of the Katingan Mentaya Project's efforts to support local well-being while respecting the unique cultural and geographical context of the region. By continuing to deliver health services via waterways in remote villages with limited road access, the project demonstrates adaptability to local needs. This culturally sensitive approach ensures that essential services reach underserved populations without disrupting their traditional ways of life (Åhrén, 2004; CIFOR, n.d.).

The Katingan Mentaya Project actively incorporates cultural heritage preservation into its overarching environmental and social strategies. Through its annual audits under frameworks like

World Rainforest Movement (WRM). (n.d.). The Katingan REDD+ Project in Indonesia: The Commodification of.... Retrieved from WRM website.

the Climate, Community, and Biodiversity Standard (CCB) and ongoing data collection via the SIRETA database, the project tracks and evaluates its impact on cultural heritage alongside other sustainability metrics (Permian Global, 2023). This transparent and systematic approach underscores the project's dedication to long-term cultural and environmental stewardship. The Katingan Mentaya Project's efforts to preserve and protect cultural heritage are not static but dynamic, reflecting the evolving needs of the communities it serves. By embedding cultural heritage into its climate and biodiversity initiatives, the project sets a precedent for sustainable development that values and safeguards cultural identity. As challenges such as land tenure issues and local politics arise, the Katingan Mentaya Project continues to prioritise meaningful community engagement, ensuring that its activities remain culturally relevant and inclusive (Lenzerini, 2011).¹⁵

By maintaining programmes that integrate traditional livelihoods with sustainable practices, the Katingan Mentaya Project continues to protect and strengthen the cultural heritage of local communities across the 34 villages in the project zone. During this monitoring period, community rubber gardens were supported in 11 villages across Mendawai and Kamipang sub-districts, engaging more than 220 households. These programmes combined traditional rubber cultivation methods with improved processing and marketing, ensuring that long-standing community practices could thrive within sustainable economic systems. Similarly, small-scale rattan

¹⁵ Anaya, S. J. (2005). Indigenous Peoples' Participatory Rights in Relation to Decisions about Natural Resource Extraction. *Arizona Journal of International and Comparative Law*, 22(1), 7–17.

Center for International Forestry Research (CIFOR). (n.d.). Katingan Peatland Restoration and Conservation Project, Central Kalimantan, Indonesia. Retrieved from CIFOR website.

Janke, T. (2009). *Beyond Guarding Ground: A Vision for a National Indigenous Cultural Authority*. Terri Janke and Company.

Lenzerini, F. (2011). Intangible Cultural Heritage: The Living Culture of Peoples. *European Journal of International Law*, 22(1), 101–120.

Permian Global. (2023). Katingan Mentaya Project: Achieving Sustainability Through Innovation. Retrieved from Permian Global website.

United Nations. (2007). United Nations Declaration on the Rights of Indigenous Peoples. Retrieved from <https://www.un.org>.

United Nations. (2015). *Transforming Our World: The 2030 Agenda for Sustainable Development*. Retrieved from <https://www.un.org>.

Xanthaki, A., Valkonen, S., Heinämäki, L., & Nuorgam, P. (Eds.). (2017). *Indigenous Peoples' Cultural Heritage: Rights, Debates, and Challenges*. Brill.

enterprises were revitalised in seven villages, involving 164 producers, many of whom are women. Training on sustainable harvesting and handicraft production allowed communities to maintain traditional craftsmanship while diversifying income sources, reinforcing pride in local cultural expressions.

Healthcare delivery also plays an important role in preserving cultural and social integrity.

Through the project's Floating Health Service (Pelayanan Kesehatan Terapung), medical teams reached 18 remote riverside villages located in the Mendawai and Seranau zones. These villages have limited road access, and the use of traditional waterways for service delivery respects local geographic and cultural realities. Between 2020 and 2023, over 2,400 residents—particularly mothers, children, and the elderly—benefited from health checks, maternal care, and education on nutrition and hygiene.

Together, these initiatives demonstrate the project's continued commitment to safeguarding both tangible and intangible cultural heritage. By aligning economic, health, and environmental interventions with local traditions and knowledge systems, the project ensures that development strengthens, rather than replaces, community identity and resilience.

2.5.5 Recognition of Property Rights (VCS, 3.7, 3.18, 3.19; CCB, G5.1)

Disputes over rights to territories and resources	N/A - The Katingan Mentaya Project activities were designed and implemented in full participation with project-zone communities following FPIC principles. PT RMU is the sole concession holder, and no disputes over territories or resources were reported during the monitoring period.
Respect for property rights	Ongoing measures implemented to protect and preserve the property rights of stakeholders, Indigenous Peoples (IPs), Local Communities (LCs), and customary rights holders include the adherence to FPIC principles, consultations with communities, and securing legal approvals for the concession. PT RMU holds two Ecosystem Restoration Concession licenses covering a total of 157,875 hectares. These licences provide PT RMU with the right to manage the land for forest and peatland restoration, including generating and selling carbon offset credits. Additionally, partnerships and MoUs with village authorities further support the recognition of property and customary rights.

2.5.6 Benefit Sharing Mechanism (VCS, 3.18, 3.19)

Summary of the benefit sharing plan

The benefit-sharing agreement outlines how the project will distribute benefits among various stakeholders. These benefits arise from the project's contributions to community development, environmental conservation, and economic activities, and are implemented within a framework that emphasises social and environmental sustainability.

The agreement identifies several direct beneficiaries, categorised as follows:

Community in 34 villages (2021-2023):

These villages receive project support in alignment with the project's overall goal. This support includes funding and resources for community development activities, with an emphasis on sustainability and social well-being. The project's progress in these villages is tracked through an MRV (Monitoring, Reporting, and Verification) system, ensuring transparency and accountability.

Forest Farmer Group:

This group is responsible for managing agroforestry initiatives within a framework of Social Management. The group works under a forest partnership scheme, which allows them to engage in sustainable forest management practices while benefiting economically from forest-related activities.

Forest Village Management Unit (LPHD):

The project strengthens the LPHD by enhancing its capacity to manage and protect local forests. This includes providing operational support, such as training, resources, and technical assistance to ensure effective forest management and conservation practices.

Special Project for Tampelas Village:

This is a targeted initiative aimed at addressing the specific development needs of Tampelas village. The project focuses on improving infrastructure, local services, and economic opportunities in this village, ensuring that it receives dedicated attention to its unique challenges.

Koperasi Tani Agroekologi Lestari (STA):

This cooperative is dedicated to promoting sustainable agroecological farming practices. The project supports STA by providing resources and technical assistance, which enables the cooperative to improve farming methods, increase productivity, and enhance the livelihoods of its members.

Community Development Programme:

The project implements a broad range of community development initiatives, including healthcare, education, microfinance, alternative livelihoods, economic development, Climate-Smart Agriculture, and women-led microfinance activities. These initiatives aim to improve overall community well-being, with a special focus on empowering women and promoting sustainable practices.

Community Firefighter Groups:

The project provides operational and technical support to village-based firefighter groups in up to 34 villages. These groups are responsible for managing fire risks, particularly in forested areas, and their work is essential for protecting both the community and the environment.

Privacy and Confidentiality

Where affected stakeholder groups wish to keep elements of the benefit-sharing agreement private, the project proponent will provide the full arrangement as a commercially sensitive document, ensuring that only authorised parties can access the confidential information. If certain stakeholders have renegotiated or opted out of the plan during the monitoring period, any changes to the benefit-sharing agreement will be documented, with full transparency about the reasons for these changes. To respect the privacy of the communities, the project proponent will demonstrate through consultations and documentation that the community has explicitly requested certain elements to remain private. This ensures that the

	community's autonomy and preferences are upheld, while still maintaining the integrity of the agreement. In cases where elements of the plan remain confidential, a high-level summary of the benefit-sharing agreement will be provided publicly, focusing on the overarching principles and outcomes without revealing sensitive details. This balance ensures transparency in the project's operations while safeguarding the community's privacy and sensitive commercial arrangements.
Benefit sharing during the monitoring period	The implementation of the benefit-sharing plan for the Katingan Mentaya Project has been executed with various initiatives aimed at community development and environmental sustainability. As part of the project, the benefit-sharing plan is structured to support a range of community activities aligned with the overarching goal of ecosystem restoration. Key points of implementation include: Community Engagement: The project has supported 34 villages across the region by providing resources for development and environmental initiatives. These include agroecology, education, social forestry, biodiversity conservation, healthcare, and microfinance, among others. The engagement process follows a participatory approach where community members discuss and prioritise activities through a bottom-up strategy at village meetings. Capacity Building: Several local groups, such as the Forest Farmer Group and the Forest Village Management Unit (LPHD), have been empowered through training and operational support. These groups manage agroforestry and ensure the sustainable use of forest resources. Additionally, the project supports the Koperasi Tani Agroekologi Lestari (STA) cooperative, promoting sustainable farming practices. Specialised Support: Specific villages, like Tampelas, have received tailored assistance to meet their development needs, such as improvements in infrastructure, services,

	and economic opportunities. This targeted support helps address the unique challenges faced by these communities. Alternative Livelihoods: To reduce the community's reliance on logging and unsustainable practices, the project has introduced alternative livelihoods such as Climate Smart Agriculture and women-led microfinance activities. These efforts not only provide economic benefits but also promote sustainability and resilience against environmental threats like forest fires. Monitoring and Feedback: The project employs a Monitoring, Reporting, and Verification (MRV) system to track progress and adjust activities as needed. FGDs and surveys have been conducted to assess the impact of these initiatives and ensure that the benefits are being fairly distributed and effectively implemented. The benefit-sharing plan, while largely transparent, includes provisions for protecting sensitive information where stakeholders have requested privacy. In these cases, the full benefit-sharing arrangement is treated as a commercially sensitive document. Changes to the agreement, such as stakeholders opting out or renegotiating terms, are documented and aligned with the communities' preferences.
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2.5.7 Free, Prior, and Informed Consent (VCS, 3.18, 3.19; CCB, G5.2)

Consent	The Katingan Mentaya Project has followed a comprehensive process to obtain consent from Indigenous Peoples (IPs), Local Communities (LCs), and customary rights holders for the implementation of its activities. This process adheres to the principles of FPIC, ensuring that the rights and interests of these groups are respected. Key aspects of the consent process include:
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	Partnerships with NGOs and Local Organisations: The project engaged NGOs like Yayasan Puter and other community organisations in its preparatory activities. These partnerships facilitated community engagement and ensured that local perspectives and needs were considered. Participatory Mapping: An important aspect of the project's community engagement was participatory mapping, conducted in collaboration with organisations like Yayasan Puter. This process helped in clarifying village borders and establishing land-use plans in accordance with the customary laws and tenure systems of the local communities. Community Consultations: The project conducted village meetings and used posters in selected villages for community engagement. This approach ensured that the local communities were informed about the project's plans for ecosystem restoration and other related activities. Respect for Local Tenure Systems: The project acknowledged the weak legal tenure status of the villages based on customary laws. By recognising these systems, the project demonstrated respect for the rights and traditions of local communities. Transparent Communication: Throughout its implementation, the project maintained transparent communication with local stakeholders, focusing on mutual understanding and respect for the community's traditional practices and needs. The consent process was integral to the project's approach, ensuring that the local communities' views were incorporated into the project planning and implementation stages.
Outcome of FPIC	The outcome of the FPIC process for the Katingan Mentaya Project reflects a commitment to ensuring no negative impact on the land rights and livelihoods of Indigenous Peoples, Local Communities, and customary rights holders. Key outcomes include: No Encroachment or Displacement: The project area does not encompass any communities living within the protected area. This approach has ensured that there has been no encroachment on land, relocation of people without consent, or forced physical or economic displacement.

	Community Development Programmes: The project delivers community development programmes across the wider project zone, which includes 34 villages. These programmes have been designed through close collaboration with the communities, improving their lives, livelihoods, and wellbeing for over 15 years. Transparent Agreements: The project has established MoU agreements with the 34 villages within the project zone. These agreements are based on periodic reconfirmations, ensuring ongoing consent and support from the communities. Regular Data Collection and Review: The project collects regular data through internal staff reporting systems and the SIRETA database. This data is used to assess the project's impact on the communities and the environment, ensuring that the FPIC process's outcomes are continually monitored and validated.
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2.5.8 Property Right Protection (VCS, 3.18, 3.19; CCB, G5.3)

During the 2020–2023 monitoring period, the Katingan Mentaya Project maintained a comprehensive grievance and dispute mechanism covering all project zones. Review of the Grievance Register (40 cases, all resolved) and the Dispute Register (3 cases, all resolved) confirms that no project activity has resulted in involuntary removal or relocation of property rights holders from their lands, nor in the forced relocation of cultural or livelihood-related activities. All project interventions, including rewetting, reforestation, and canal blocking, were conducted under Free, Prior, and Informed Consent (FPIC) agreements with affected communities.

Minor disputes, such as those concerning canal blocking in Satiruk and Bapinang Hilir, or community access during rewetting, were resolved collaboratively through meetings with village representatives and government authorities, resulting in mutually agreed solutions (e.g., provision of clean water tanks, joint reforestation work). Each case was documented in the SIRETA system and confirmed closed. The project also provided training and information sessions on grievance procedures to ensure community awareness and participation.

These records demonstrate that all project activities complied with the Climate, Community & Biodiversity (CCB) Standards safeguards, ensuring no involuntary relocation, no loss of tenure rights, and equitable participation in project decisions affecting land use or livelihoods.

2.5.9 Identification of Illegal Activity (VCS, 3.19; CCB, G5.4)

The Katingan Mentaya Project has identified various illegal activities within its project zone that could potentially affect its impacts. These activities include illegal logging or mining within protected forests, hunting of protected species, and the use of fire for land clearing. To address and reduce these illegal activities and ensure that project benefits are not derived from them, the project has implemented a combination of strategies:

Protection and Enforcement: The project has put in place measures for the protection and enforcement of regulations within the project zone. This includes monitoring activities to prevent illegal logging, mining, and hunting of protected species.

Education and Awareness Programmes: The project has implemented education and awareness programmes aimed at schools and local communities. These programmes are designed to inform and educate community members about the negative impacts of illegal activities on the environment and biodiversity.

Strengthening Tenure Rights: By strengthening tenure rights, the project aims to empower local communities and give them a vested interest in the conservation of their environment. Secure tenure rights often lead to better stewardship of the land, as communities have more to gain from sustainable practices and more to lose from illegal activities.

Providing Sustainable Livelihood Options: The project offers sustainable livelihood options and employment opportunities to local communities. This approach helps to reduce the dependence of local people on illegal activities as a source of income, by providing alternative, legal, and sustainable ways to earn a living.

Zero Tolerance for Human Trafficking, Forced Labour, and Child Labour: The Katingan Mentaya Project explicitly states that it does not use victims of human trafficking, forced labour, or child labour. This commitment is in line with international labour standards and human rights laws. The project likely has mechanisms in place to ensure compliance with these standards, including regular audits and monitoring of labour practices.

The combination of these strategies demonstrates the Katingan Mentaya Project's comprehensive approach to mitigating the risk of illegal activities within its project zone and

ensuring that the project's benefits are not derived from such activities. The project's commitment to ethical practices and community engagement underscores its dedication to sustainable development and conservation while respecting human rights and local livelihoods.

2.5.10 Ongoing Disputes (VCS, 3.18, 3.19; CCB, G5.5)

No ongoing disputes

3 CLIMATE

3.1 Monitoring GHG Emission Reductions and Removals

3.1.1 Data and Parameters Available at Validation (VCS, 3.16)

Data and parameters available at validation as per VCS methodology VM0007 are provided in the tables below. A full list of all relevant data and parameters is further provided in the MR Climate Annex document.

Data / parameter	$\Delta C_{BSL,planned}$
Data unit	tCO ₂ e
Description	Net greenhouse gas emissions in the baseline from planned deforestation
Source of data	Calculated following module BL-PL. See PD Section 3.2.2.5.
Value applied	PD Table 3.32
Justification of choice of data or description of measurement methods and procedures applied	Calculated following module BL-PL. See PD Section 3.2.2.5.
Purpose of data	Calculation of baseline emissions
Comments	N/A

Data / parameter	$GHG_{BSL-WRC}$
Data unit	tCO ₂ e
Description	Net GHG emissions in the WRC baseline scenario up to year t*
Source of data	Calculated following module BL-PL. See PD Section 3.2.2.4.
Value applied	PD Table 3.24

Justification of choice of data or description of measurement methods and procedures applied	Calculated following module BL-PL. See PD Section 3.2.2.4.
Purpose of data	Calculation of baseline emissions
Comments	N/A

3.1.2 Data and Parameters Monitored (VCS, 3.16)

Data and parameters to be monitored per VCS methodology VM0007 are provided in the tables below. A full list of all relevant data and parameters is further provided in the MR Climate Annex.

Data / parameter	$\Delta C_{WPS-REDD}$
Data unit	tCO2e
Description	Net GHG emissions in the REDD project scenario up to year t*
Source of data	Calculated following module M-REDD. See MR Section 3.2.2.3.
Description of measurement methods and procedures to be applied	See MR Sections 3.1.3.3.1, 3.1.3.3.2 and 3.2.2.3
Frequency of monitoring/recording	Every year
Value applied	See MR Tables 3.10, 3.11 and 3.12
Monitoring equipment	See MR Sections 3.1.3.3.1, 3.1.3.3.2 and 3.2.2.3
QA/QC procedures to be applied	See MR Sections 3.1.3.3.1, 3.1.3.3.2 and 3.2.2.3
Purpose of data	Calculation of project emissions
Calculation method	See MR Sections 3.1.3.3.1, 3.1.3.3.2 and 3.2.2.3
Comments	N/A

Data / parameter	$\Delta C_{LK-AS,planned}$
Data unit	tCO2e
Description	Net greenhouse gas emissions due to activity shifting leakage for projects preventing planned deforestation
Source of data	Calculated following module LK-ASP. See MR Section 3.2.3.1
Description of measurement methods and procedures to be applied	See MR Section 3.2.3.1
Frequency of monitoring/recording	Every year
Value applied	0

Data / parameter	$GHG_{WPS-WRC}$
Data unit	tCO2e
Description	Net GHG emissions in the WRC project scenario up to year t*
Source of data	Calculated following module M-PEAT. See MR Sections 3.2.2.4, 3.1.3.3.3 and 3.1.3.3.4.
Description of measurement methods and procedures to be applied	See MR Sections 3.2.2.4, 3.1.3.3.3 and 3.1.3.3.4.
Frequency of monitoring/recording	Every year
Value applied	Table 3.13 in MR Section 3.2.2.4
Monitoring equipment	See MR Sections 3.2.2.4, 3.1.3.3.3 and 3.1.3.3.4.
QA/QC procedures to be applied	See MR Sections 3.2.2.4, 3.1.3.3.3 and 3.1.3.3.4.
Purpose of data	Calculation of project emissions

Calculation method	See MR Sections 3.2.2.4, 3.1.3.3.3 and 3.1.3.3.4.
Comments	N/A

Data / parameter	GHG_{LK-ECO}
Data unit	tCO2e
Description	Net GHG emissions due to ecological leakage from the WRC project activity up to year t
Source of data	Monitored following module LK-ECO. See MR Section 3.2.3.2.
Description of measurement methods and procedures to be applied	See MR Section 3.2.3.2.
Frequency of monitoring/recording	Every year
Value applied	0
Monitoring equipment	See MR Section 3.2.3.2.
QA/QC procedures to be applied	See MR Section 3.2.3.2.
Purpose of data	Calculation of leakage emissions
Calculation method	See MR Section 3.2.3.2.
Comments	N/A

3.1.3 Monitoring Plan (VCS, 3.16, 3.20)

3.1.3.1 Data management methods and structure

All data generated by the Katingan Mentaya Project is centrally managed in an online-based database. Hard copies of all data sheets are archived in field offices, with duplicate copies stored centrally in PT. RMU's headquarters in Bogor (Figure 3.1). Field data is uploaded directly into the

online database system from the field office, allowing simultaneous multi-user input through a local server network. After the data is collated by the database server, it can be adapted to fulfil all monitoring and reporting needs using standard and custom-made report formats. Hard and soft copies of all data will be stored for a minimum of two years beyond the end of the project crediting period (31st October 2070).

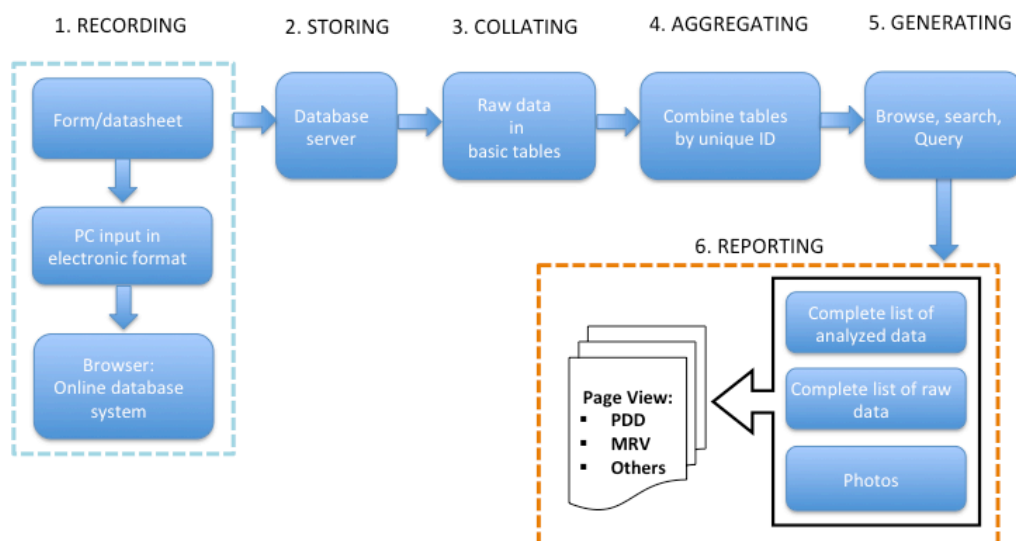


Figure 3.1. Simple schematic of data management structure

3.1.3.2 Procedures for handling internal auditing and non-conformities

Internal auditing and non-conformities are addressed through standard operation procedures (SOPs) that incorporate multiple quality assurance and quality control (QA/QC) measures (Figure 3.2). All data collected, recorded, stored and reported are subject to review and approval by team leaders and/or project managers with reference to written SOPs covering each level of data management. In order to ensure the security and traceability of data entry and QA/QC procedures, all users are allocated unique user IDs and passwords in order to access the database, and in turn their access and roles can be restricted as appropriate.

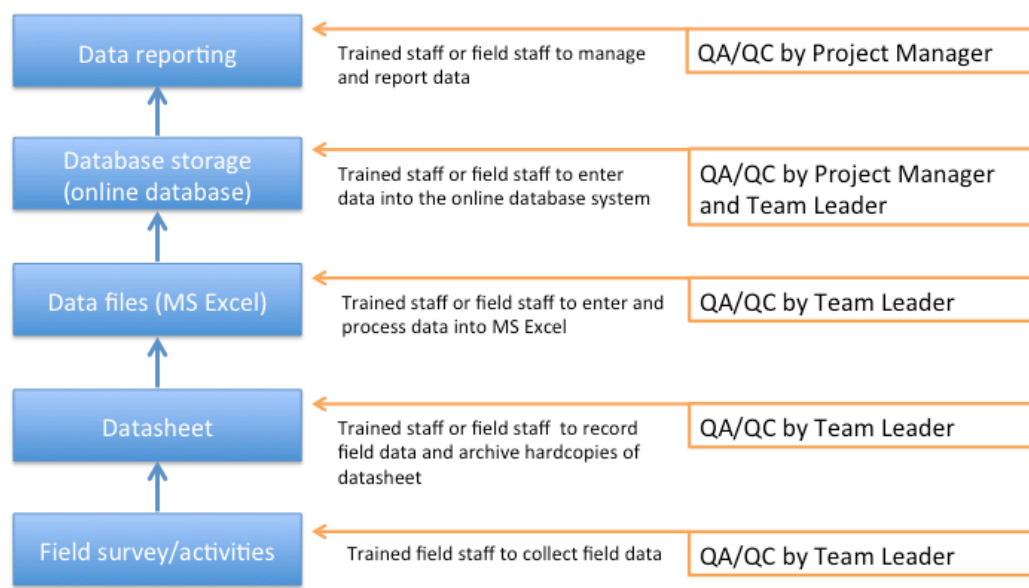


Figure 3.2. Data management QA/QC procedures

3.1.3.3 Climate impact monitoring plan and methodological approach

Climate impacts have been monitored, reported and evaluated according to the Climate MRV Tracker. This includes monitoring changes as per the VCS VM0007 methodological requirements and GHG emissions associated with relevant land uses in the project area. A summary of the main monitoring methods followed during this reporting period is given below. For further details consult the Project Description Document and relevant Annex.

The formal monitoring period reported in this report extends from 1st January 2021 to 31st December 2023, covering a total of three years. In general, all reported data refers to this exact period.

3.1.3.3.1 Annual Land Cover Change and deforestation monitoring

This section outlines the remote sensing analysis conducted to identify annual forest disturbances within the project area during the monitoring period (2021, 2022, and 2023). The original project description categorised the area into two strata: "forest" and "non-forest." Consequently, monitoring during this period concentrated on evaluating the integrity of these strata. Previous monitoring reports relied on multispectral satellite imagery to assess forest integrity, a practice that continued during this reporting period. However, some updates were made to the satellite imagery used, which are described below.

Contrary to the approach used in the previous monitoring report, which relied on the use of L-band Synthetic Aperture Radar data (ALOS-PALSAR2) to assess the forest cover, this analysis presents a new approach based on wall-to-wall classification of the project area using Very-High-Resolution (VHR) [3m spatial resolution] optical imagery from Planet (Planet, 2024). Recent

technical advances made in the Planet constellation, which ensured a larger spectral sample in high-resolution images, have allowed these data to be used satisfactorily for the classification and detection of forest disturbances in the project area. In August 2021, the launch of the new SuperDoves (PSB.SD) satellites extended the capability of this dataset by adding four new spectral bands (Yellow, Red-edge, Green I and Coastal-blue) to the four already existing (blue, green, red, and near-infrared (NIR)) on earlier Dove PS2.SD sensors (see Table 3.1). The new PSB.SD unveils new possibilities for continuous monitoring of forests and projects, improving review times of previous acquisitions and therefore increasing the chances of obtaining cloud-free images, as well as allowing data harmonisation with other optical sensors (i.e., Sentinel 2). Please refer to the table below in this section to see the absorption range for each band.

Table 3.1. Reference table with PSB.SD instrument information including bands and wavelength range (Planet, 2024).

Band	Name	Wavelength (<i>fwhm</i>)	Interoperable with Sentinel-2
1	Coastal Blue	443 (20)	Yes - with Sentinel-2 band 1
2	Blue	490 (50)	Yes - with Sentinel-2 band 2
3	Green I	531 (36)	No equivalent with Sentinel-2
4	Green	565 (36)	Yes - with Sentinel-2 band 3
5	Yellow	610 (20)	No equivalent with Sentinel-2
6	Red	665 (31)	Yes - with Sentinel-2 band 4
7	Red Edge	705 (15)	Yes - with Sentinel-2 band 5
8	NIR	865 (40)	Yes - with Sentinel-2 band 8a

A Planet image composite (PSB.SD) was generated for each monitoring year, including cloud-free images acquired during the monitoring period (see Climate Annex). The annual forest disturbance analyses were performed using a supervised object-based image analysis (Maximum Likelihood Classification tool) over the forest area. In order to assess the accuracy of the resulting classification, an accuracy assessment was performed using a set of random validation points and high-resolution Planet annual composites. A total of 120 points were randomly distributed among the classes, where 90 points were assigned to the forest area, and 30 to the 'non-forest' class (Figure 3.3). These points were then visually investigated on the PlanetScope images to determine if they had been correctly classified. Additional band combinations of Planet composites, based on Near-Infrared (NIR), as well as spectral vegetation indices such as the Normalized Difference Vegetation Index (NDVI) and LiDAR-based Chloris Above-Ground-Biomass (AGB) data, were also used to support the visual assessment. A confusion matrix was produced for each year (Table 3.2) which established the accuracy to be 96.7% for 2021, 95.0% for 2022, and 93.3% for 2023 analyses.

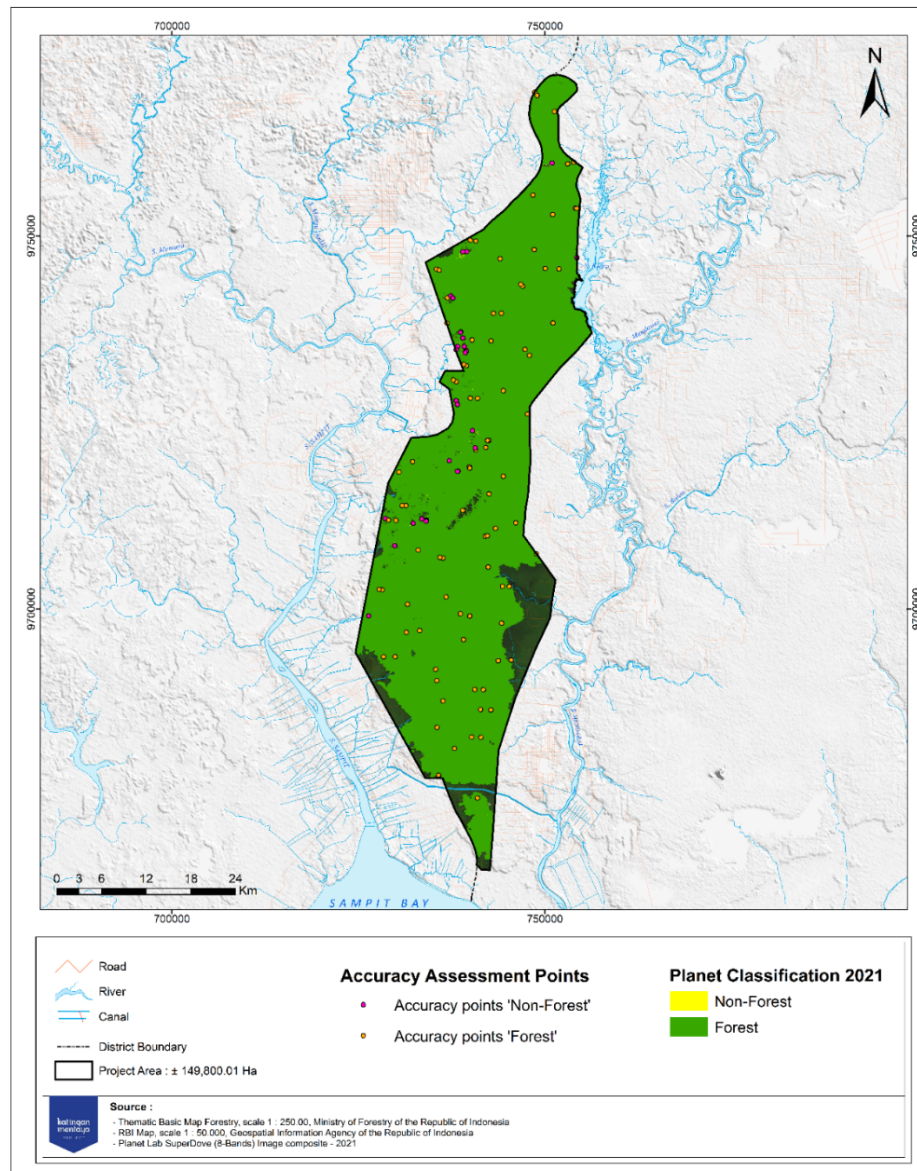


Figure 3.3. 2021 Planet Super-Dove (8-Bands) forest cover change classification and accuracy assessment points.

Table 3.2. Accuracy assessment - confusion matrices for 2021, 2022 and 2023 Annual Deforestation-Land cover classification analyses.

Land Cover class per classification image						
2021	Land Cover class per reference image	LCC	Non-Forest	Forest	Total	
		Non-Forest	27	3	30	
		Forest	1	89	90	
		Total	28	92	120	
		Overall Accuracy				96.67
		Kappa				90.91
2022	Land Cover class per reference image	Land Cover class per classification image				
		LCC	Non-Forest	Forest	Total	
		Non-Forest	24	6	30	
		Forest	0	90	90	
		Total	24	96	120	
		Overall Accuracy				95.00
	Kappa				85.71	
2023	Land Cover class per reference image	Land Cover class per classification image				
		LCC	Non-Forest	Forest	Total	
		Non-Forest	28	2	30	
		Forest	6	84	90	
	Total	34	86	120		
		Overall Accuracy				93.33
	Kappa				82.98	

The results from the Planet SuperDove (PSB.SD) Land Cover classification analysis, together with the visual assessment supported by vegetation ancillary data, were utilised to delineate forest disturbance areas. The annual image composites were generated using images with higher spectral quality and lower cloud cover. More information about the imagery use can be found in the Climate Annex.

Given the high spatial resolution (pixel resolution: 3m) of the data, a secondary classification of the forest cover changes could be performed, thus differentiating between anthropogenic (illegal logging) or natural changes (e.g. windthrow). This classification did not affect the final calculation of project scenario emissions derived from forest change, since both natural and anthropogenic disturbances were included in the calculations. Lastly, since the project's degradation emissions

are accounted for by the high-resolution AGB carbon model (Section 3.1.3.3.2), a conservative filter was applied to the resulting classifications to only include disturbances with a minimum area of 0.1 ha. A final visual investigation was carried out where all forest changes were individually assessed, removing those false positives associated with spectral inadequacies produced by clouds.

In cases where forest changes were detected, the procedures outlined in VCS methodology VM0007 module M-REDD were used to quantify the relevant parameters. See section 3.2.2 for full results.

3.1.3.3.2 Annual AGB maps and forest degradation

Aboveground biomass within the project area was quantified by integrating vegetation plot data with multiple Earth Observation (EO) data streams. Annual wall-to-wall annual above-ground biomass density maps at 30-meter resolution have been generated for the project area, thus capturing the variability in forest dynamics in greater detail. This section elaborates on the methodology and data used, but for a full detailed explanation please see the Climate Annex: Above-Ground Biomass Density Mapping.

3.1.3.3.1.1 Forest Biomass Field Measurements

As part of the Baseline renewal process, vegetation within the concession area was re-surveyed to estimate Aboveground Carbon Density (ACD) in accordance with current standards. This effort aims to generate accurate forest plot data to parameterise remote sensing datasets, enabling annual estimations of ACD growth and detecting potential degradation within the project area, while reducing the frequency of plot remeasurements.

To support this work, Chloris Geospatial's global ACD maps, which integrate the latest satellite and LiDAR technologies, was utilised. A stratified random sampling approach was applied, leveraging the Chloris ACD maps to capture the full range of biomass variability across the area. Within the Katingan Mentaya Project Forest reserve, 80 circular plots with a radius of 30m (0.28 ha) were established in 2023.

Within each plot, all stems with a diameter at breast height (DBH) ≥ 10 cm were recorded, totaling 14,788 trees. To capture the variability in height ranges within the monitored plots and the broader forest ecosystem, tree height was measured for 2,515 living trees (17.0%). These measurements were conducted using an ultrasonic hypsometer, enhancing the accuracy of the recorded data. Additionally, the heights of 556 standing dead trees were measured; however, this data was excluded from the diameter-height model. All surveyed trees were individually tagged and geo-referenced (at plot scale), ensuring their identification in subsequent field surveys.

Comprehensive details on the characteristics and variables assessed during the vegetation field plot survey are provided in the Vegetation Field Plot protocol (SOP), included in the climate annex.

Plot data including diameter at breast height (DBH), height measurements, and taxonomic information were processed using a robust and widely used allometric model framework following Chave et al. (2014) and Ledo et al. (2016). A 3-parameter Weibull model was selected for tree height estimation based on cross-validation performance, and wood density was assigned using a hierarchical approach based on taxonomic information. These parameters were used to generate plot-level biomass estimates ranging from 0-270 Mg ha⁻¹ across diverse forest types. Please refer to the Climate Annex for further details.

3.1.3.3.1.2 GEDI spaceborne LiDAR Data

The Global Ecosystem Dynamics Investigation (GEDI) is a NASA spaceborne full-waveform LiDAR mission that provides precise measurements of vegetation structure and biomass across the globe. GEDI data is spatially discontinuous 25 m diameter estimates of vegetation structure at spot locations. We use this data in this workflow to train machine learning models for the prediction of continuous forest structure metrics across the KMP area, and to enrich the information available for biomass mapping. Please refer to the Climate Annex for further details.

3.1.3.3.1.3 Harmonized Landsat and Sentinel-2 (HLS) Data

The HLS program is developed by NASA to provide harmonized reflectance across the Landsat and Sentinel-2 satellites (Ju, et al., 2025). This dataset provides significant value in the context of the KMP because cloud cover in the region is pervasive making the creation of consistent-cloud-free mosaics a significant challenge. By combining data from multiple sensors, the HLS program provides us with the ability to create a more complete and reliable dataset for biomass estimation. Please refer to the Climate Annex for further details.

3.1.3.3.1.4 Sentinel-1 radar data

Sentinel-1 is an Earth observation mission that uses C-band Synthetic Aperture Radar (SAR) to acquire imagery. Unlike optical sensors, radar can penetrate cloud cover and vegetation canopies to varying degrees, making it particularly valuable for tropical regions like Katingan where persistent cloud coverage often limits optical data availability. Radar backscatter is sensitive to vegetation structure, moisture content, and biomass, providing complementary information to optical and LiDAR data for comprehensive forest biomass estimation. Please refer to the Climate Annex for further details.

3.1.3.3.1.5 Chloris Geospatial's Aboveground Biomass Map

Chloris technology delivers direct estimates of above-ground live woody biomass (AGB) stock and change at 30x30m and 10x10m pixel resolution, anywhere on the planet. The Chloris approach is designed to generate robust, spatially explicit estimates of biomass stock, change, and related carbon emissions and removals, with pixel-level quantified uncertainty. The technology is based on sensor-fusion and proprietary ML and AI technology, combining high-quality biomass training data points collected from spaceborne- and airborne-LiDAR biomass estimates with Earth

Observations data to generate wall-to-wall maps of AGB, with annual time stamps at 30m resolution (2000 to present) and 10m resolution (2017 to present). Chloris processes every pixel value with a Bayesian time series approach. This approach removes noise in the remote-sensing data and identifies statistically significant changes for every pixel, as well as robust trends in carbon stock changes over the entire time series. The Chloris approach is based on more than a decade of peer-reviewed research, including IPCC- recognised studies. As a result, the Chloris technology has been extensively stress-tested and vetted by both the remote-sensing and carbon-cycle science communities. In addition, Chloris data are validated against independent, high-quality data collected via airborne-LiDAR and in-situ measurements from sites around the world. Chloris' annual forest biomass and structure products served as the primary benchmark dataset, with models refined and optimised using local vegetation data collected through field surveys.

The project has purchased biomass map data from Chloris Geospatial to support modelling work. At present, their data has been shown to provide best-in-class, spatially explicit, remotely-sensed biomass data. These data are trained on global datasets rather than our local forest plot data. We therefore accept that there is likely to be some bias in the predictions. However, the data are information rich and significantly contribute to the reliability of our biomass mapping work. Chloris data are used as inputs to our final local-scale machine learning model with a view to enriching this existing dataset with our own local data and additional remote sensing data. Please refer to the Climate Annex for further details.

3.1.3.3.1.6 Machine Learning Processing Pipeline

Once all data had been processed, the following machine learning (ML) steps were carried out:

1. First GEDI data were used to train a total of 31 models to predict a range of GEDI-derived metrics from the HLS and Sentinel-1 data. These models were used to create continuous canopy structure estimates across the KMP, which were then used to enrich the information available for downstream locally-optimized biomass mapping.
2. Plot data were then used to train a final model to predict biomass density from the HLS, Sentinel-1 and GEDI data.

This pipeline successfully generated comprehensive forest structure maps that captured both spatial and temporal variation in forest structure characteristics across the KMP landscape, providing essential inputs for the subsequent biomass mapping workflow. Please refer to the Climate Annex for further details.

3.1.3.3.1.7 Local Biomass Modeling Pipeline

Following the generation of forest structure maps, the final biomass mapping workflow utilised the field plot data to train a localised model that integrated EO data with the GEDI-derived structure maps to produce high-resolution biomass estimates across the KMP landscape.

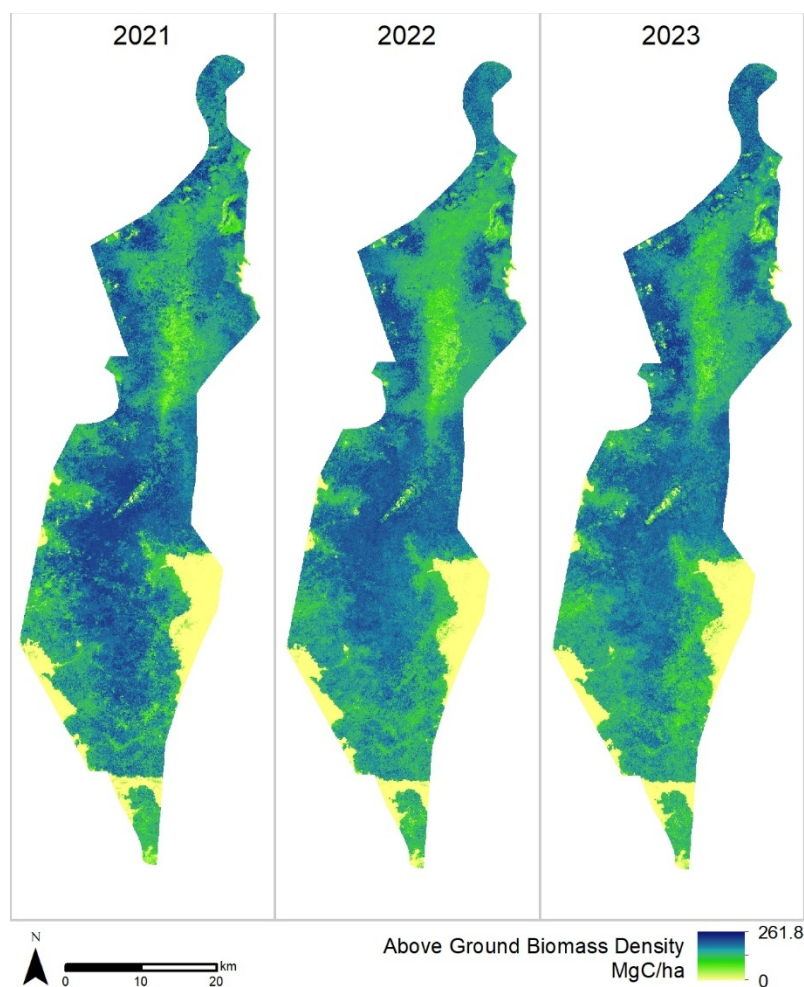


Figure 3.4. Katingan Mentaya project - Annual Above Ground Biomass (AGB) maps. Monitoring period (2021, 2022 and 2023).

Adopting the wall-to-wall above ground biomass mapping approach, as outlined above, enables a robust assessment of ongoing forest growth and degradation across the entire project area. For monitoring degradation, a biomass loss map from 2020 to 2023 was produced using the annual above ground biomass maps (please see the Climate Annex: Above-Ground Biomass density Mapping for a detailed explanation).

Following M-REDD guidance, an area subject to degradation was delineated ($ADegW,i$) as a buffer from all access points and previously cleared areas. The buffer distance was defined for this monitoring period as the average distance between the areas of illegal logging, detected with high resolution multi-spectral data as part of the land cover and deforestation analysis (Section 3.1.3.3.1), and the closest access point. The area susceptible to degradation only includes forested areas, as it is used exclusively for degradation monitoring; therefore, all non-forest areas were extracted from the buffer. The distance for this monitoring period was determined as 880.64 m and the area susceptible to degradation as 52,660.9 ha.

The project is not required to account for natural degradation, only for human induced carbon losses such as a result of illegal logging, as per M-REDD. However, when measuring degradation using the aboveground biomass loss maps all carbon losses are detected and differentiation between natural and anthropogenic degradation is not possible. In order to discern between these two types of degradation, the project measured degradation both in the area subject to degradation and in the non-accessible areas. The degradation in the non-accessible areas will be used as control for natural degradation. The average carbon loss per hectare in the non-accessible area was calculated and deducted from the degradation detected in the area subject to degradation, therefore estimating the degradation induced by illegal logging and other human activities. Non forest areas were excluded from this analysis because associated emissions are accounted for in the monitoring of deforestation (Section 3.1.3.3.1).

Therefore, anthropogenic forest degradation was assessed using aboveground biomass loss maps generated from 2020 to 2023. The resulting maps (Figure 3.5), with a 120-meter spatial resolution, depict decreases in biomass density over time, from which the annual average degradation value was derived. See Section 3.2.3.3.2 for full results.

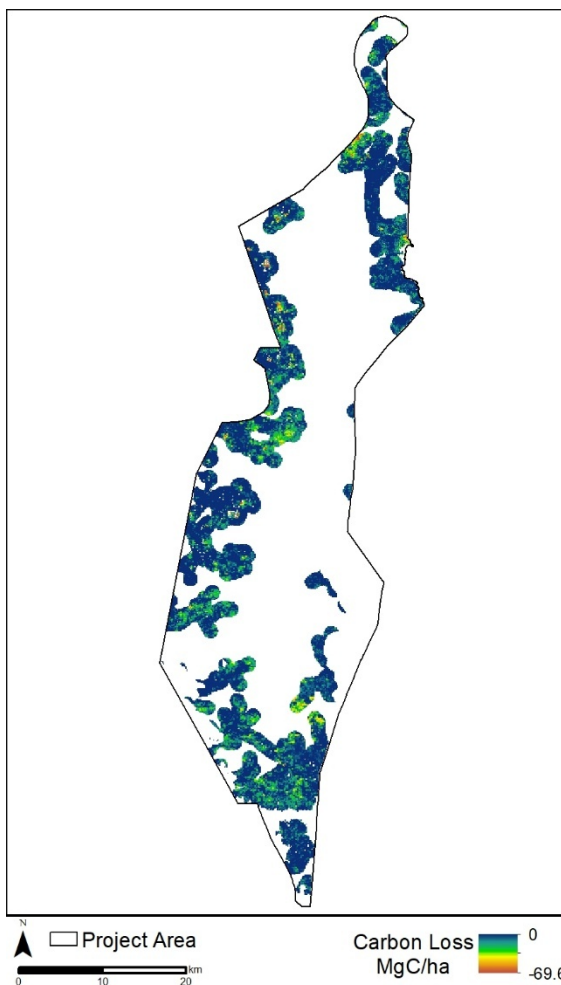


Figure 3.5. Annual forest degradation within areas subject to degradation (Mg C ha^{-1}). Monitoring period (2021, 2022 and 2023).

3.1.3.3.3 Monitoring GHG Emissions from microbial decomposition of peat

Monitoring of GHG emissions from microbial decompositions of peat is carried out by producing a stratification map of the project for each year. This stratification is updated each year by incorporating any changes detected during the land cover and deforestation analysis (see Sub-Section 3.1.3.3.1), any fires detected in the project area (see Sub-Section 3.1.3.3.5) and any changes in the water bodies (see Sub-Section 3.1.3.3.4). The area covered by each stratum is calculated for each year, and the corresponding emission factor is applied to each area. Although rewetting activities have taken place during this monitoring period (17 new canal blockings plus all previously built canal blockings), the project conservatively decided not to re-classify any of these areas as “re-wetted” (from their current “drained” status) until we have solid evidence that the canal blockings are having a significant effect on water table depth. Therefore, no VCUs are being claimed from rewetting activities for this monitoring period.

Table 3.3 shows the area for each stratum for 2021, 2022 and 2023 as well as the emission factors used for each stratum. Figure 3.6 shows the distribution of each stratum across the project area for each year.

Table 3.3. Emission factor and area for each strata for this monitoring period

	Strata	Emission Factors (tCO ₂ e ha ⁻¹ yr ⁻¹)		Area (ha)		
		CO ₂	CH ₄	2021	2022	2023
Land	REDD Forest	-3.12	1.18	89,910.2	89,800.7	89,706.5
	REDD Drained Forest	8.20	0.13	26,217.3	26,147.6	26,110.8
	WRC Excluded	-	-	20,349.0	20,349.0	20,349.1
	Recovering Burn	14.49	11.26	6,051.0	6,051.0	6,145.7
	Drained Recovering Burn	25.80	11.26	3,668.2	3,668.2	3,902.0
	Drained Young Burn	7.82	11.27	1,386.1	1,386.1	1,165.2
	NonForest	-0.87	1.23	868.4	977.8	1,072.0
	Young Burn	-3.49	11.27	831.8	831.8	724.1
	Drained NonForest	10.44	0.13	305.2	374.9	411.5
	NonPeat Excluded	-	-	91.1	91.1	91.1
Water	Waterbody	-	-	121.5	121.5	121.5
	Project Canal	89.52	23.95	0.2	0.3	0.5
Total				149,800.0	149,800.0	149,800.0

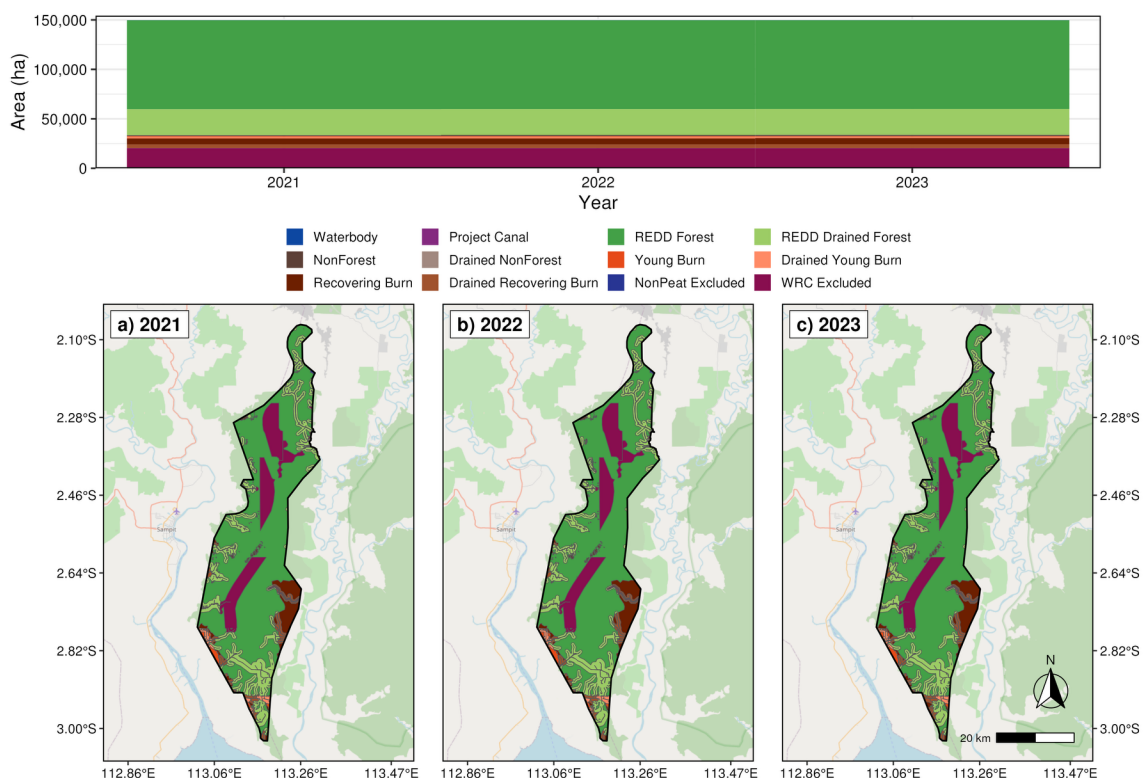


Figure 3.6. Project scenario land-use transitions and spatial distribution for the monitoring period. The top bar chart shows strata area change over time. Panels (a)–(c) show the spatial distribution of strata at 2021, 2022, 2023 respectively. The north arrow and scale bar in panel (c) apply to all map panels.

Tier 2 emission factors are used, but these have been estimated using a predictive model that incorporates water table depth and land use class as variables. Traditional approaches, which often relied on broad land-use categories, failed to capture the complexities of emissions influenced by site-specific factors such as water table depth. By integrating water table depth and land use class and using a fixed and random effects model, this method offers a more dynamic approach, enhancing the accuracy and applicability of emission predictions across diverse landscapes. The predictive model was built with peer-reviewed data, published up to September 2023.

The model can be utilised to predict emissions based solely on water table depth or, where available, by incorporating management practices or above-ground conditions. The emission factors used for each land-use class are calculated at the mean water table depth for each stratum based on the available data. Notably, emissions for each class can be predicted at any specified water table depth, thus allowing us to update the emission factor for any class when new data becomes available (from the literature or specifically from the project). Please see the PD Climate Annex for more details on the emission factors.

3.1.3.3.4 Monitoring GHG Emissions from water bodies

Changes in water body areas are monitored based on channel widths and lengths derived from the combination of regular field measurements and remote sensing techniques. Any new

detected canal or any changes detected in an existing feature would be included in project stratification, updating the water body stratum; its area would be recalculated, and the appropriate emissions factors would be applied. The drainage effect of any new water bodies would also be implemented in the stratification, thus having also an effect on the emissions from microbial decomposition of peat.

Our treatment of the waterborne carbon follows the IPCC's terminology in considering "on-site" and "off-site" emissions. "Waterborne on-site" emissions of GHGs are associated with gas evasion from the water surface to the atmosphere within the peatland catchment (i.e., drainage canals, ditches, field drains). These emissions include CO₂ evasion, CH₄ evasion, and potentially also the non-carbon GHG nitrous oxide N₂O. Both CO₂ and CH₄ on-site emissions from water bodies are accounted for in the baseline scenario. N₂O is conservatively omitted.

"Off-site" emissions of waterborne carbon occur primarily through downstream export of dissolved organic and inorganic carbon (DOC and DIC). While IPCC (2013) guidance typically attributes such emissions solely to DOC degradation, accounting for DOC requires applying emission factors to all waterbody catchment areas (Prijs et al. (2022)).

Delineating catchment areas in the baseline scenario proves impractical due to the extensive network of ditches on the peatland. Consequently, the project conservatively excludes off-site emissions (DOC) from waterbodies. This approach is justified because the baseline scenario contains significantly more ditches than the project scenario—meaning that excluding these emissions biases against the baseline, where they would be larger. Additionally, since both on-site CO₂ and CH₄ emissions are accounted for, this exclusion avoids any risk of double counting.

The emission factors for on-site CO₂ and CH₄ were extracted from the literature and are therefore tier 1. For a detailed explanation of how they were calculated please see the PD Climate Annex.

VMD0042 permits GHG emissions from channels and ditches existing at the project start date to be conservatively omitted from GHG accounting; this project has adopted that approach. Consequently, all waterbodies present at the project start date have been excluded from WRC accounting. The waterbodies included in the analysis are therefore limited to two strata: "Baseline Canal" (baseline scenario) and "Project Canal" (project scenario, which capture any canals constructed illegally after the project start date).

No new water features were identified or modified in 2021 or 2022, but a new canal was illegally dug inside the PA in 2023. The area of the new canals has been included in the stratum "Project Canal" and its associated GHG emissions calculated. A drainage buffer had also been applied to this new canal, therefore impacting also the soil emissions. This new canal was blocked in 2024, but as with all other blocked canals, the drainage zone will be classified as "drained" until sufficient evidence proves that the water table depth has increased and can be reclassified as "rewetted".

Table 3.4 shows the updated area of the “Project Canal” stratum as its associated emissions factors, and Figure 3.7 shows the location of the new canal.

Table 3.4 Updated area of the Project Canal stratum for the 2023 monitoring period alongside ditch emission factors. Change shows net new canal area added in 2023 relative to 2022.

Strata	Area (ha)			Change (ha)	Emission Factor (tCO ₂ e ha ⁻¹ yr ⁻¹)	
	2021	2022	2023	Δ 2022→2023	CO ₂	CH ₄
Project Canal	0.261	0.261	0.512	0.251	89.52	23.95

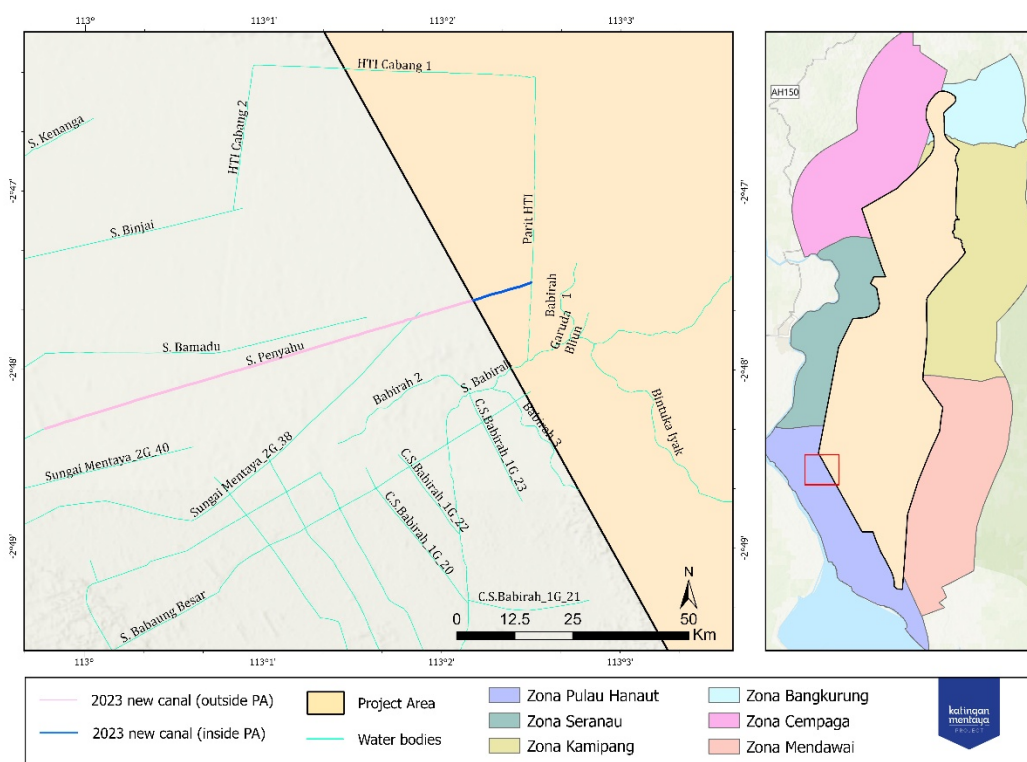


Figure 3.7. Location of the new canal identified during 2023 fieldwork.

3.1.3.3.5 Fire Monitoring

The technical and field team monitors the presence of any fire within the project area or in the surrounding project zones and, if there were to be any fires, evaluates the best course of action to avoid spread (see Figure 3.8). During the monitoring period, new advanced fire alert monitoring tools have been incorporated into the monitoring system with the aim of improving detection and response to these disturbances. Until 2023, the fire team continued using NASA-FIRMS and SIPONGI as the main satellite alert detection systems. However, from the end of 2023, the project has integrated OroraTech Wildfire solution into the project fire monitoring system (Orora

Technologies, 2020). OroraTech solution has significantly contributed to improve temporal and spatial detection accuracy and assessment of fire events, thus offering an alternative to the limited capabilities in detection confidence and temporal resolution identified in the NASA FIRMS system (NASA, 2001).

KMP FIRES DETECTION AND SUPPRESSION MANAGEMENT SYSTEM

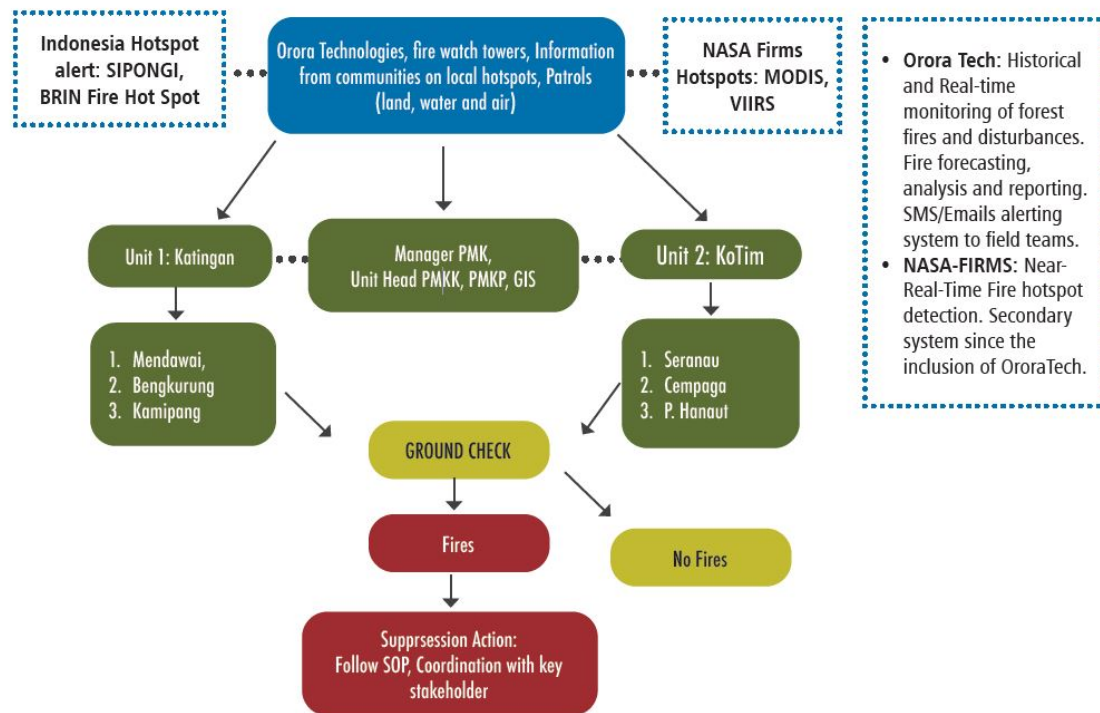


Figure 3.8. Overview of the fire detection and suppression management system at the Katingan Mentaya Project.

Hotspot alerts, that are generated via the continuous satellite monitoring of both NASA-FIRMS and OroraTech systems are automatically distributed as SMS and email to the project fire management team and the heads of the affected zone. These alerts provide critical information, including GPS coordinates, estimated accuracy or confidence levels, and the corresponding time and date. Coordination efforts are facilitated through a combination of radio communication, SMS, and email. Following the integration of the OroraTech system, the fire monitoring coverage has been significantly expanded, enabling the detection of any fire alerts within the designated project area or an additional 15,000-meter buffer zone. Within this monitoring area, a 3000m buffer around the project is prioritised for checking and verification by the field team, and other approaches (e.g. drone surveys) may be used to verify more distant hotspots (Figure 3.9). As part of the reporting and verification process, the Fire team also utilises additional national hotspots alert systems (e.g. SIPONGI and BRIN) as well as prepares monthly summaries with information on the fire monitoring activities that have occurred in the project area and its surrounding regions.

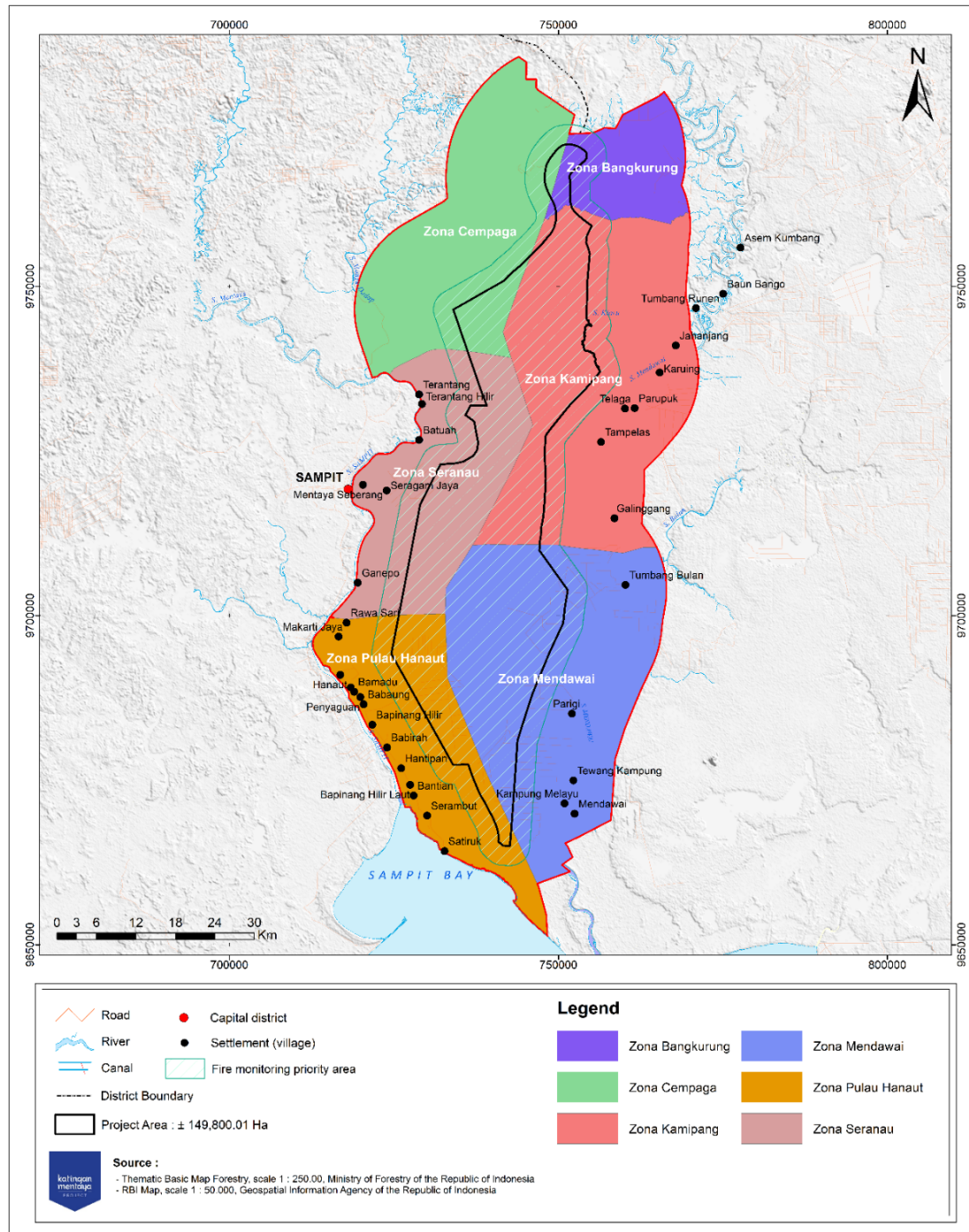


Figure 3.9. Reference map with fire monitoring zones and priority monitoring area. The EO-based OroraTech wildfire system provides near-real-time information on fire events in this region, automatically distributing hotspot alerts to the field teams in each zone.

In the event of a fire event affecting the project area, coinciding or near-coinciding high-resolution optical satellite imagery (e.g., Planet, Sentinel-2, Landsat 8-9) and synthetic aperture radar (SAR) imagery (e.g., Sentinel-1) are utilised to perform a multi-temporal analysis of the fire's impact on the forest. This analysis helps assess the environmental conditions both prior to and following

the event, providing a comprehensive evaluation of the fire's effects. Various optical spectral indices would be used to characterise the affected areas, paying special attention to those developed specifically for the study of fires such as the dNBR – Difference Normalized Burn Ratio (UN-Spider, 2017) or BAI - Burn Area Index (Filipponi, 2018). Supporting SAR images are also considered in those scenarios in which cloud cover does prevent the acquisition of optical cloud-free imagery. In this case, specific radar indices such as the RBR - Radar Burn Ratio (Tanase et al., 2015), which study the variation in the electromagnetic signal derived from structural changes in environmental conditions, would also be used. Using this approach, burned areas would be mapped and emissions produced by the fire would be calculated by applying the M-REDD and E-BPB modules and accounted for each specific year of the monitoring period.

In summary, the revised multi-tiered approach to forest and peatland fire management leverages the strengths of each level, combining wide-scale surveillance with localised precision and on-the-ground expertise to improve overall effectiveness in detecting, preventing and mitigating the impact of wildfires. A report was recently released detailing upgrades in fire prevention and monitoring performed during the monitoring period (Permian Global, 2024).

No fire incidents occurred during the 2021, 2022, and 2023 monitoring period (see section 3.2.2).

3.1.3.3.6 Rewetting activities

A total of 34 canal-blocking structures were constructed during the 2021–2023 period, of which 15 are located outside the Project Area and 19 within the Project Area. These structures were installed across 13 canals. In some cases, canals received additional or replacement structures, as a single canal may contain multiple canal blocks.

No changes to the project stratification were made as a result of these rewetting activities; accordingly, no emission reductions were attributed to them during this monitoring period.

Figure 3.1010 illustrates the locations of the canal-blocking structures constructed during this period. A detailed inventory of all structures is provided in the Climate Annex.

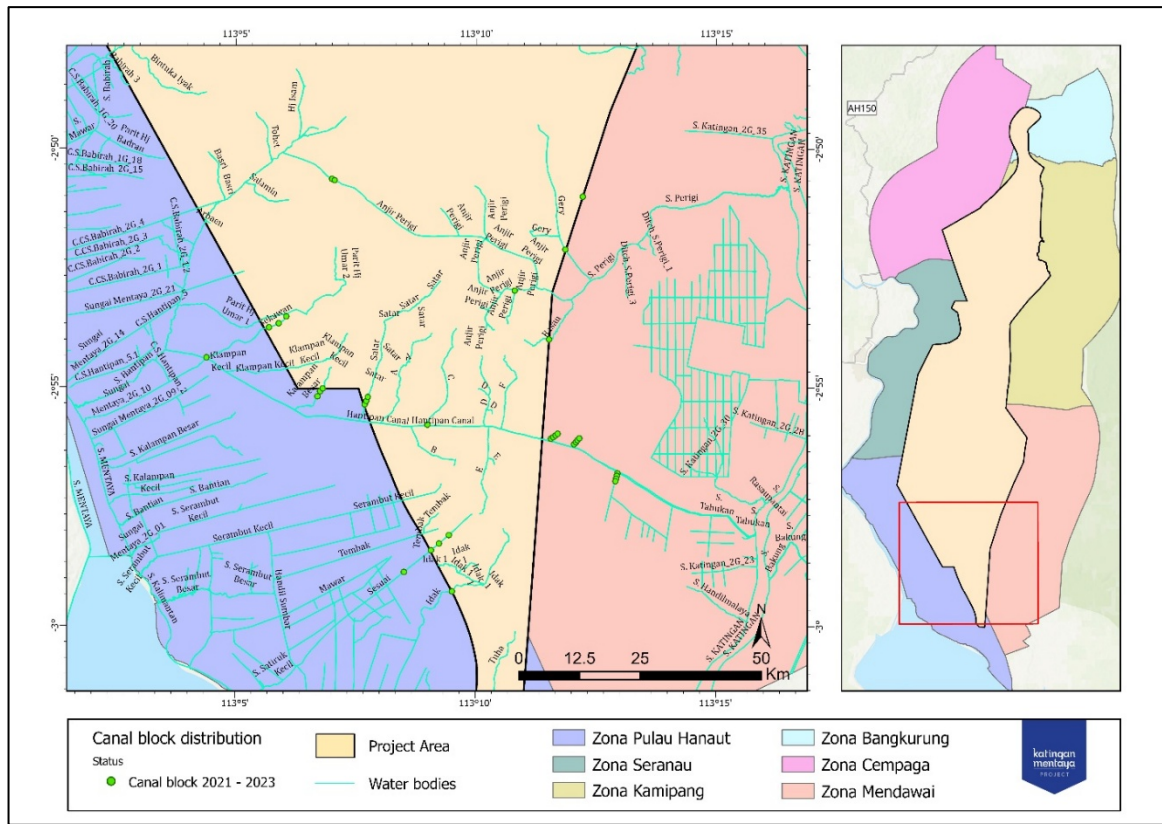


Figure 3.10. Location of canal blocking structures constructed between 2021 and 2023.

3.1.4 Dissemination of Monitoring Plan and Results (VCS, 3.18; CCB, CL4.2)

The Katingan Mentaya Project produces documents in both Indonesian and English languages which are distributed through appropriate means to local communities and stakeholders, as well as organises workshops and meetings to communicate the project's validation and verification process.

For each verification event (as it was done for the validation), in every village, village officials and local people are invited to attend a formal meeting/socialisation to explain the PD/MR and the verification process. In this meeting, PT. RMU staff explains the PD and/or MR, and specific project achievements if any, including a reflection on the monitoring period. The staff also informs the meeting participants about the schedule of the verification process, and what kind of activities will take place as part of it. A summary of the PD and/or MR in Bahasa Indonesia is distributed to participants, including a short infographic in Bahasa Indonesia. The participants have the opportunity to ask questions, comment, and raise any issues during these meetings. Records of these meetings are kept in the form of minutes, photos and an attendees' list.

Both PD and MRs are uploaded to the Katingan Mentaya Project website.

3.2 Quantification of GHG Emission Reductions and Removals

3.2.1 Baseline Emissions (VCS, 3.15)

This section summarises the baseline emissions for each component for 2021, 2022 and 2023. For a detailed explanation on how the baseline emissions were calculated please refer to Section 3.2.2 of Project Description Document. Figure 3.11 shows how land cover would change in the baseline scenario for the years within this monitoring period.

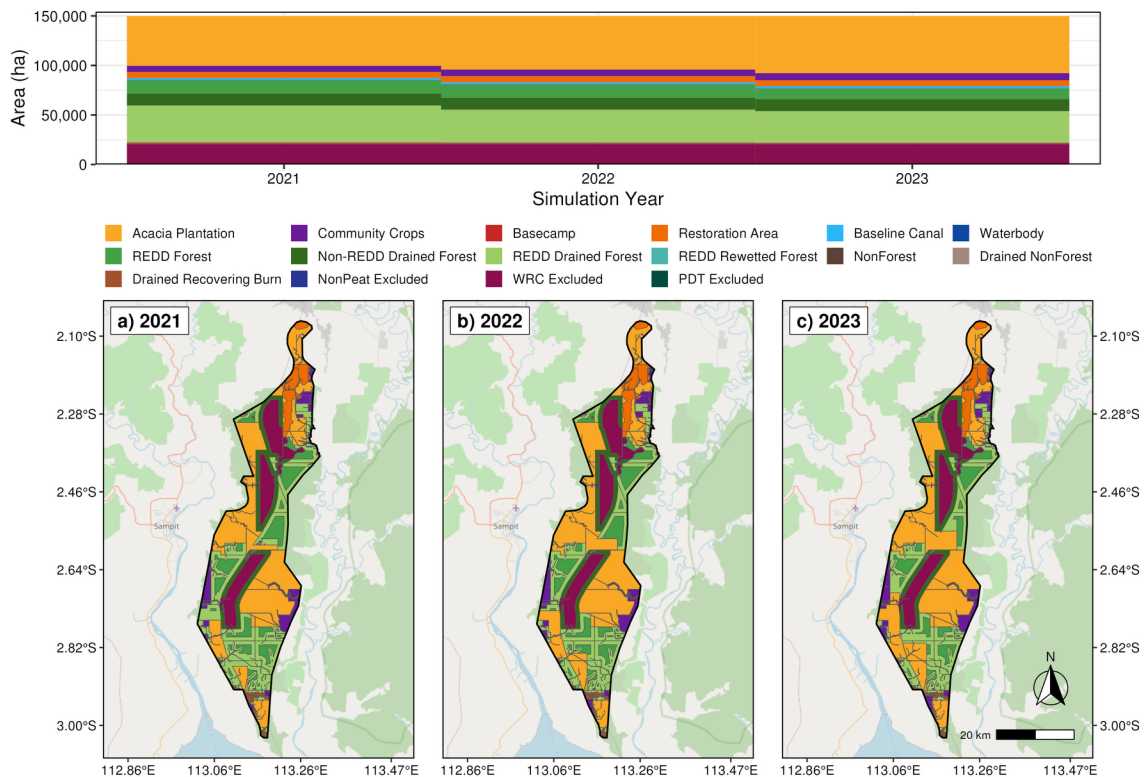


Figure 3.11. Baseline scenario land-use transitions and spatial distribution for the monitoring period. The top bar chart shows strata area change over time. Panels (a)–(c) show the spatial distribution of strata at 2021, 2022, 2023 respectively. The north arrow and scale bar in panel (c) apply to all map panels.

Error! Reference source not found. shows the area for each soil stratum in the baseline for 2021, 2022 and 2023 and its corresponding emission factor.

Table 3.5 Emission factors and areas for different strata in 2021, 2022 and 2023 of the Baseline scenario. CO₂ and CH₄ emission factors (tC ha⁻¹ yr⁻¹) are shown alongside corresponding water table depth (cm) and expected areas (ha).

Strata	BSL Area (ha)			Water Table Depth (cm)	Emission Factor	
	2021	2022	2023		CO ₂ (tC ha ⁻¹ yr ⁻¹)	CH ₄ (tC ha ⁻¹ yr ⁻¹)
Acacia Plantation	50,207.4	53,972.2	57,572.4	-80.00	19.17	0.0006
Community Crops	6,246.1	6,695.7	7,145.4	-80.00	9.98	0.0016
Basecamp	209.9	209.9	209.9	-80.00	21.50	0.0045
Restoration Area	5,924.6	5,924.6	5,924.6	-24.50	11.67	0.0560
Baseline Canal	1,942.1	1,942.1	2,107.5	-	24.41	0.6438
Waterbody	287.0	287.0	287.0	-	-	-
REDD Forest	13,319.3	13,319.3	10,537.6	-0.25	-0.85	0.0317
Non-REDD Drained Forest	12,175.0	12,175.0	12,175.0	-23.10	2.24	0.0034
REDD Drained Forest	36,719.1	32,690.9	31,441.4	-23.10	2.24	0.0034
REDD Rewetted Forest	78.1	78.1	78.1	-11.42	0.07	0.0560
NonForest	16.6	16.6	16.5	-0.25	-0.24	0.0331
Drained NonForest	502.2	429.5	425.5	-23.10	2.85	0.0034
Drained Recovering Burn	1,537.0	1,410.1	1,230.2	-23.10	7.04	0.3029
NonPeat Excluded	91.1	91.1	91.1	-	-	-
WRC Excluded	20,349.1	20,349.1	20,349.0	-	-	-
PDT Excluded	195.4	208.8	208.8	-	-	-
Total	149,800.0	149,800.0	149,800.0			

3.2.1.1 Baseline emissions from aboveground biomass (REDD)

Table 3.6 shows baseline emissions from deforestation this monitoring period. For details on how they were calculated please see Section 3.2.2.5 of the Project Description Document.

Table 3.6. Baseline emissions (tCO₂e) resulting from land-use changes, including acacia plantations, community crops, and infrastructure, disaggregated by agent and summarised for 2021–2023.

Vint age Year	Baseline REDD Emissions (tCO ₂ e)									
	Acacia Plantation			Community Crops			Infrastructure			Total
	Agent A	Age nt B	Agent C	Agent A	Ag ent B	Agent C	Agent A	Agent B	Agent C	
2021	189,910	- 15,934	13,717	348,365	- 2,601	19,436	215,709	22,743	13,775	805,119
2022	269,731	- 17,874	-	343,417	- 786	-	227,163	8,618	-	830,269
2023	241,448	- 16,331	15,380	337,174	- 647	19,232	242,325	5,758	13,289	857,628
Total2,493,016										

3.2.1.2 Baseline emissions from soil and water bodies (WRC)

3.2.1.2.1 Baseline emissions from microbial decomposition of peat

Table 3.7 shows baseline emissions from microbial decomposition of peat for this monitoring period. For details on how they were calculated please see Section 3.2.2.4.1 of the Project Description Document.

Table 3.7. Annual and total baseline (tCO₂e) emissions from soil microbial decomposition, detailing contributions of CO₂ and CH₄ across vintage years 2021–2023.

Vintage Year	Baseline Soil Microbial Decomposition (tCO ₂ e)		
	CO ₂	CH ₄	Total
2021	4,431,725.7	53,289.8	4,485,015.5
2022	4,675,727.6	51,445.9	4,727,173.5
2023	4,938,959.6	46,087.4	4,985,047.0
Total	14,046,413	150,823	14,197,236

3.2.1.2.2 Baseline emissions from peat burning

Table 3.8 shows baseline emissions from peat burning for this monitoring period. For details on how they were calculated please see Section 3.2.2.4.2 of the Project Description Document.

Table 3.8. Annual and cumulative baseline emissions (tCO₂e) from peat burning, disaggregated by CO₂, CH₄, and N₂O, for vintage years 2021–2023.

Vintage Year	Baseline Peat Burn Emissions (tCO ₂ e)			
	CO ₂	CH ₄	N ₂ O	Total
2021	1,064,518.7	366,258.4	34,131.6	1,464,908.7
2022	1,100,630.8	378,683.2	35,289.5	1,514,603.5
2023	1,004,760.9	345,698.2	32,215.6	1,382,674.7
Total	3,169,910	1,090,640	101,637	4,362,187

3.2.1.2.3 Baseline emissions from water bodies in peatlands

Table 3.9 shows baseline emissions from water bodies for this monitoring period. For details on how they were calculated please see Section 3.2.2.4.3 of the Project Description Document.

Table 3.9. Emissions associated with baseline ditch processes, encompassing CO₂ and CH₄ for vintage years 2021-2023, with annual and total values.

Vintage Year	Baseline Ditch Emissions (tCO ₂ e)		
	CO ₂	CH ₄	Total
2021	173,865.8	46,511.1	220,376.8
2022	173,864.1	46,510.6	220,374.8
2023	188,669.9	50,471.3	239,141.2
Total	536,400	143,493	679,893

3.2.2 Project Emissions (VCS, 3.15)

3.2.2.1 General procedures and assumptions

Emissions in the project scenario that are accounted result from:

- Above ground biomass stock changes due to REDD activities: deforestation, forest degradation and fires.
- Soil and water bodies (WRC): peat microbial decomposition, water bodies in peatlands and peat burning.

GHG sources included in or excluded from project emissions are listed in the PD (Sub-section 3.1.3.2). Tier 2 emissions factors are used for the emission calculations from peat (see Sub-sections 3.1.3.3.3 and 3.1.3.3.4, and the PD Climate Annex for details).

3.2.2.2 Summary of stratification changes

Due to the forest change identified as illegal logging activities or natural disturbance during the monitoring period, as described in Section 3.1.3.3.1, the annual project stratification maps were updated (see Figure 3.12 and Table 3.10). Natural disturbances were assessed separately and found to have negligible impact on emissions and were therefore excluded (37.2 ha, 10,210 t CO₂e, 0.051% of total emissions). See the Climate Annex for detailed analysis.

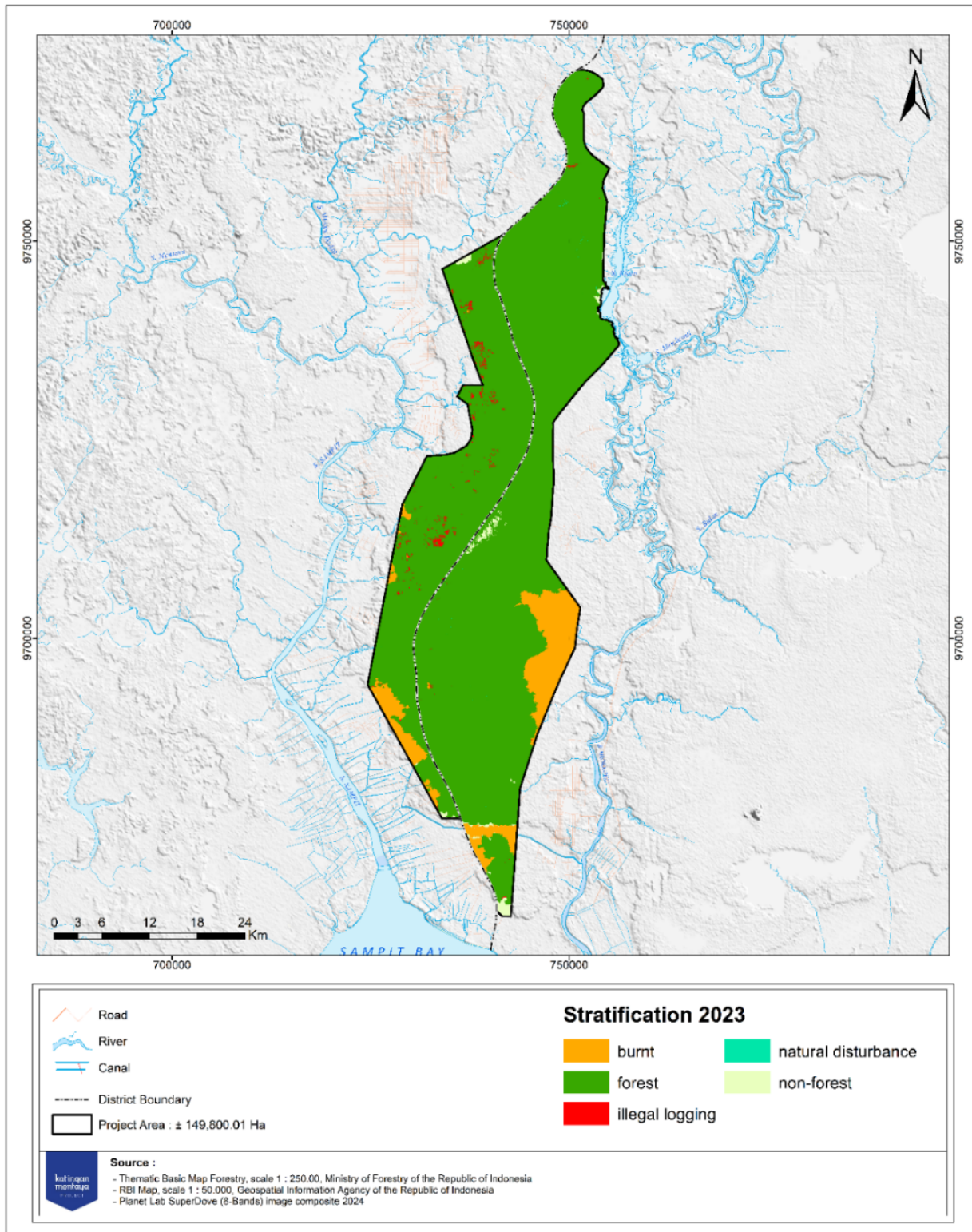


Figure 3.12. Final project stratification at the end of the monitoring period ending on the 31st of December 2023.

Table 3.10. 2021, 2022 and 2023 Stratification classes and areas.

Land Cover Class	2021 area (ha)	2022 area (ha)	2023 area (ha)
Forest	135,871.1	135,684.0	135,546.7
Burnt	12,579.9	12,579.9	12,579.9
Illegal Logged	528.8	715.9	852.9
NonForest	698.5	698.5	698.5
Water bodies	121.7	121.7	122.0
Total	149,800.0	149,800.0	149,800.0

3.2.2.3 Project emissions from aboveground biomass (REDD)

The forest structural changes in the project scenario are driven by both forest regrowth and disturbances, which include fire-related events as well as non-fire disturbances such as illegal logging and natural ecological dynamics.

3.2.3.3.1 Project emissions from deforestation

PlanetScope SuperDove (PSB.SD) imagery and vegetation ancillary data were used to quantify deforestation (see section 3.1.3.3.1 and Climate annex - Land cover section for a detailed explanation). In total, 137.47 ha, 187.26 ha, and 137.07 ha of forest disturbance from illegal logging were detected across the project forest area during the current monitoring period (2021, 2022 and 2023 respectively). Similarly, 2.98 ha, 25.01 ha and 9.19 ha of natural disturbance were detected during the current monitoring period (2021, 2022 and 2023 respectively) (Table 3.11 and Section 3.1.3.3).

Table 3.11 Area deforested in the project area for the years 2021, 2022 and 2023

Year	Illegal logging (ha)	Natural disturbance (ha)
2021	137.47	2.98
2022	187.26	25.01
2023	137.07	9.19
Total	461.8	37.2

According to M-REDD, emissions resulting from natural disturbances may be omitted if they are deemed *de minimis* through the use of Appendix 1 of REDD-MF. Therefore, the guidance of that

appendix was used and it was determined that emissions from natural disturbance could be excluded. Please see the Climate Annex for details on this analysis.

The AGB maps were used to extract the total above ground carbon present in the deforested area each year (only in the illegal logging areas).

The net carbon stock change as a result of deforestation ($\Delta C_{DefPA,u,i,t}$) is equal to the area deforested from illegal logging multiplied by the emission per unit area (Equation 3.1).

$$\Delta C_{DefPA,u,i,t} = A_{DefPA,u,i,t} * \Delta C_{pools,P,Def,u,i,t} \quad (3.1)$$

Where:

$\Delta C_{DefPA,u,i,t}$ Net carbon stock change as a result of deforestation in the project case in the project area in stratum i at time t ; t CO₂-e

$A_{DefPA,u,i,t}$ Area of recorded deforestation in the project area stratum i converted to land use u at time t ; ha

$\Delta C_{pools,P,Def,u,i,t}$ Net carbon stock changes in all pools in the project case in land use u in stratum i at time t ; t CO₂-e ha⁻¹

By applying the above equation, net carbon stock change as a result of deforestation from illegal logging ($\Delta C_{DefPA,u,i,t}$) was determined to be 44,314.2 t CO₂e, 60,764.5 t CO₂e, and 44,270.9 t CO₂e for 2021, 2022, and 2023 respectively (see Table 3.12).

Table 3.12 Project emissions from illegal logging deforestation, detailing area, biomass density, total biomass, carbon stock, and CO₂ equivalent emissions for vintage years 2021–2023.

Vintage Year	Project Emissions from Illegal Logging					
	Area (ha)	Biomass (t)	Area (%)	Biomass (t ha ⁻¹)	Carbon Stock (tC)	Carbon Dioxide (tCO ₂ e)
2021	137.5	25,714.2	0.092	187.0	12,085.7	44,314.2
2022	187.2	35,259.9	0.125	188.3	16,572.1	60,764.5
2023	137.1	25,689.1	0.091	187.4	12,073.9	44,270.9
Total						149,350

3.2.3.3.2 Project emissions from forest degradation

Forest degradation was quantified using the above ground biomass loss maps as described in Section 3.1.3.3.2. Anthropogenic forest degradation was quantified for the area subject to degradation, using the non-accessible areas as control for natural degradation. Carbon stock changes from degradation were derived from the AGB maps, results are presented in Table 3.13.

Table 3.13 Carbon stock change from forest degradation in project area within the 2021, 2022 and 2023 monitoring period showing accessible area analysis, natural area control, and anthropogenic degradation calculations.

Vintage Year	Area Subject to Degradation		Non-Accessible Area	Anthropogenic Degradation			
	Area (ha)	Average Degradation ($\text{t ha}^{-1} \text{ yr}^{-1}$)	Average Degradation ($\text{t ha}^{-1} \text{ yr}^{-1}$)	Average Difference ($\text{t ha}^{-1} \text{ yr}^{-1}$)	Biomass (t)	Carbon (tC)	Emissions (tCO_2e)
2021	52,660.9	2.26	1.816	0.443	23,371.9	10,984.8	40,277.7
2022	52,660.9	2.26	1.816	0.444	23,372.0	10,984.8	40,277.7
2023	52,660.9	2.26	1.816	0.444	23,372.0	10,984.9	40,277.7
Total							120,833

3.2.3.3.3 Emissions from uncontrolled biomass burning

As detailed in section 3.1.3.3.5 above, the project monitors the presence of any fire within or just outside project area using field patrolling as well as OroraTech and NASA FIRMS satellite alerts (NASA, 2001; Orora Technologies, 2020). Figure 3.13 presents all NASA FIRMS alerts for the monitoring period (2021, 2022 and 2023). Throughout the monitoring period, the sole fire event presenting a significant risk to the project area environment was recorded in September 2023 within the Pulau Hanaut area, where the fire extended to a location in close proximity to the project boundaries. Despite its proximity, the fire was effectively controlled and extinguished by the fire brigade before it could pose any impact on the project area (Highlighted circled region in Figure 3.13). Additional information on this event will be provided to the verification body, including detailed pre- and post-event imagery and documentation, evidencing that the fire was successfully contained and did not encroach upon the project boundaries.

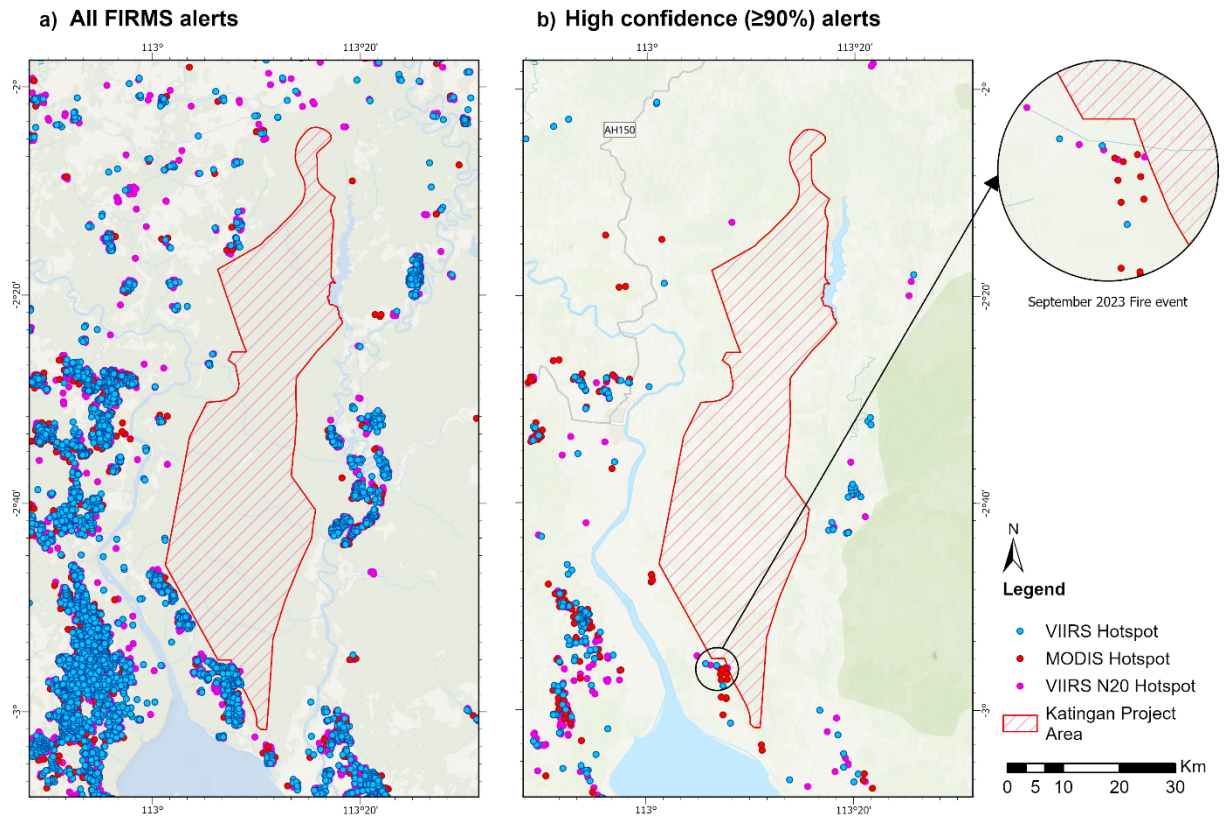


Figure 3.13. NASA-FIRMS alerts for the monitoring period (01/01/2021 - 31/12/2023). Figure a) shows all alerts from the three integrated FIRMS sensors, while b) shows only the alerts with high detection confidence ($>90\%$), which are of greater value for monitoring due to their reliability. All data will be provided to the verification body.

As can be seen in Figure 3.13, **no fires** were registered within the project area during the 2021, 2022 and 2023 monitoring period. The specific dataset containing all fire alerts for the monitoring period will be provided during the verification.

However, a big fire occurred in 2015 which resulted in 8,368.93 ha of forest burnt and 1,326.25 ha of non-forest area, mostly dominated by ferns, burnt. Based on observations by the field team, this event caused the non-tree vegetation to combust but only killed, rather than combusted, affected trees (which either fell, or remained standing). This was confirmed from high resolution drone data, in which fallen and standing dead trees were observed, but not fully combusted trees. Based on this finding, the emission calculations for burnt biomass in 2015 combined two approaches. For the non-tree biomass, procedures in E-BPB were followed as all biomass was assumed as combusted and therefore instantaneously released CO_2 . For the tree biomass, the emissions were conservatively calculated by assuming the affected trees would decompose over time. Please see the first Monitoring Report for further details.

The emissions from dead wood decomposition from the tree biomass affected in the 2015 event have been reported in each monitoring report since. Emissions are calculated for each year based on how much dead biomass would remain the previous year. To calculate the emissions,

the guidance in BL-PL for dead wood has been followed, therefore assuming an annual rate of decay of 1/10 of the stock change for 10 years.

Table 3.14 presents the emissions from dead wood decomposition from the 2015 fire for 2021, 2022 and 2023.

Table 3.14. Emissions from dead wood decomposition from the 2015 fire. Monitoring period (2021, 2022 and 2023).

Vintage Year	Dead Wood Decay	
	tC	tCO _{2e}
2021	14,105.9	51,721.6
2022	14,105.9	51,721.6
2023	14,105.9	51,721.7
Total	42,318	155,165

3.2.2.4 Project emissions from soil and water bodies (WRC)

Quantification of GHG emissions from peat and water bodies are made up of three elements: microbial decomposition of peat, emissions from water bodies, and emissions from peat burning (see Table 3.15). These emission sources are calculated separately and subsequently combined to produce an overall estimate of peat emissions using the procedures provided in VCS methodology VM0007, modules BL-PEAT and M-PEAT (equation 3.4):

$$GHG_{WPS-WRC} = \sum_{t=1}^{t^*} \sum_{i=1}^M (E_{peatsoil-WPS,i,t} + E_{peatditch-WPS,i,t} + E_{peatburn-WPS,i,t}) \quad (3.4)$$

Where:

$GHG_{WPS-WRC}$	Net CO ₂ equivalent peat GHG emissions in the project scenario up to year t* (t CO _{2e})
$E_{peatsoil-WPS,i,t}$	GHG emissions from microbial decomposition of the peat soil within the project boundary in the project scenario in stratum i in year t (t CO _{2e} yr ⁻¹)
$E_{peatditch-WPS,i,t}$	GHG emissions from water bodies within the project boundary in the project scenario in stratum i in year t (t CO _{2e} yr ⁻¹)

Epeatburn-WPS,i,t GHG emissions from burning of peat within the project boundary in the project scenario in stratum i in year t (t CO₂e yr⁻¹). In this project this term equals zero.

I 1, 2, 3 ...M strata in the project scenario (unitless)

T 1, 2, 3, ... t* time elapsed since the project start (years)

Methods for estimating carbon stock, subsidence, and peat thickness dynamics are described in the Project Description and its climate annex. The next subsections give details regarding the emission calculations for each WRC component.

Table 3.15. Project Annual Carbon Emissions from peat soil microbial decomposition, peat ditch and peat burn from 2021 to 2023 vintage years.

Vintage Year	Project GHG Emission Components (tCO ₂ e)			
	Soil Microbial Decomposition	Ditch	Burned	Total
2021	372,208.6	29.6	0	372,238.2
2022	372,616.3	29.6	0	372,645.9
2023	378,965.1	58.2	0	379,023.3
Total	1,123,790	117	0	1,123,907

3.2.3.3.4 Emissions from microbial decomposition of peat

The temporal variability of the emissions from peat microbial decomposition are directly related to the land use and land use changes in the project scenario. During this monitoring period, all changes in land use were due to illegal logging (see Section 3.2.2.2). The soil strata were updated to reflect these changes, as shown in Table 3.16.

Table 3.16 Emission factors and areas for different strata in 2021, 2022 and 2023 of the project scenario. CO₂ and CH₄ emission factors (tC ha⁻¹ yr⁻¹) are shown alongside corresponding water table depth (cm) and expected areas (ha).

Strata	WPS Area (ha)			Water Table Depth (cm)	Emission Factor	
	2021	2022	2023		CO ₂ (tC ha ⁻¹ yr ⁻¹)	CH ₄ (tC ha ⁻¹ yr ⁻¹)
Waterbody	121.5	121.5	121.5	-	-	-
Project Canal	0.2	0.3	0.5	-	24.41	0.6438

Strata	WPS Area (ha)			Water Table Depth (cm)	Emission Factor	
	2021	2022	2023		CO ₂ (tC ha ⁻¹ yr ⁻¹)	CH ₄ (tC ha ⁻¹ yr ⁻¹)
REDD Forest	89,910.2	89,800.7	89,706.5	-0.25	-0.85	0.0317
REDD Drained Forest	26,217.3	26,147.6	26,110.8	-23.10	2.24	0.0034
NonForest	868.4	977.8	1,072.0	-0.25	-0.24	0.0331
Drained NonForest	305.2	374.9	411.5	-23.10	2.85	0.0034
Young Burn	831.8	831.8	724.1	-0.25	-0.95	0.3028
Drained Young Burn	1,386.1	1,386.1	1,165.2	-23.10	2.13	0.3028
Recovering Burn	6,051.0	6,051.0	6,145.7	-0.25	3.95	0.3029
Drained Recovering Burn	3,668.2	3,668.2	3,902.0	-23.09	7.04	0.3029
NonPeat Excluded	91.1	91.1	91.1	-	-	-
WRC Excluded	20,349.0	20,349.0	20,349.1	-	-	-
Total	149,800.0	149,800.0	149,800.0			

Emissions from microbial decomposition are calculated using Equations 3.5, 3.6 and 3.7 defined by the VCS methodology VM0007 modules BL-PEAT and M-PEAT:

$$E_{\text{peatsoil-WPS},i,t} = E_{\text{peatsoil-WPS,CO}_2,i,t} + E_{\text{peatsoil-WPS,CH}_4,i,t} \quad (3.5)$$

Where:

$E_{\text{peatsoil-WPS},i,t}$ GHG emissions from the peat soil within the project boundary in the project scenario in stratum i at year t (t CO₂ yr⁻¹)

$E_{\text{peatsoil-WPS,CO}_2,i,t}$ CO₂ emissions from the peat soil within the project boundary in the project scenario in stratum i at year t (t CO₂ yr⁻¹)

$E_{\text{peatsoil-WPS,CH}_4,i,t}$ CH₄ emissions from the peat soil within the project boundary in the project scenario in stratum i at year t (t CO₂ yr⁻¹)

i 1, 2, 3 ... M_{WPS} strata in the project scenario (unitless)

t 1, 2, 3, ... t^* time elapsed since the project start (yr)

For each stratum, the CO₂ emissions from microbial decomposition of the peat within the project boundary were estimated as follows:

$$E_{\text{peatsoil-WPS,CO}_2,i,t} = A_{i,t} \times EF_{\text{CO}_2,i,t} \quad (3.6)$$

Where:

$E_{\text{peatsoil-WPS,CO}_2,i,t}$	CO ₂ emissions from the peat soil within the project boundary in the project scenario in stratum i at year t (t CO ₂ yr ⁻¹)
$EF_{\text{CO}_2,i,t}$	Emission factor for CO ₂ emissions corresponds to each stratum i (t CO ₂ ha ⁻¹ yr ⁻¹)
$A_{i,t}$	Area of stratum i at time t (ha)
i	1, 2, 3 ... M_{WPS} strata in the project scenario (unitless)
t	1, 2, 3, ... t^* time elapsed since the project start (yr)

For each stratum, the CH₄ emission from the peat soil within the project boundary were estimated as follows:

$$E_{\text{peatsoil-WPS,CH}_4,i,t} = A_{i,t} \times GWP_{\text{CH}_4} \times EF_{\text{CH}_4,i,t} \quad (3.7)$$

Where:

$E_{\text{peatsoil-WPS,CH}_4,i,t}$	CH ₄ emissions from the peat soil within the project boundary in the project scenario in stratum i at year t (t CO ₂ yr ⁻¹)
$EF_{\text{CH}_4,i,t}$	Emission factor for CH ₄ emissions corresponds to each stratum i (t CO ₂ ha ⁻¹ yr ⁻¹)
$A_{i,t}$	Area of stratum i at time t (ha)
GWP_{CH_4}	Global Warming Potential for CH ₄
i	1, 2, 3 ... M_{WPS} strata in the project scenario (unitless)
t	1, 2, 3, ... t^* time elapsed since the project start (yr)

Calculated annual GHG emissions from microbial decompositions of peat in the project scenario for each gas by strata is presented in Table 3.17.

Table 3.17. Project annual emissions from peat soil microbial decomposition from 2021 to 2023 vintage years.

Vintage Year	Project Soil Microbial Decomposition (tCO ₂ e)		
	CO ₂	CH ₄	Total
2021	127,417.2	244,791.3	372,208.6
2022	127,818.9	244,797.4	372,616.3
2023	134,162.6	244,802.6	378,965.1
Total	389,399	734,391	1,123,790

3.2.3.3.5 Emissions from peat burning

As described in the Emissions from uncontrolled biomass burning section, **no fires** were registered within the project area during the 2021, 2022 and 2023 monitoring period. Therefore, no emissions from peat burning occurred during this monitoring period.

3.2.3.3.6 Emissions from water bodies

As in the baseline scenario, CO₂ and CH₄ on-site emissions are accounted for in the project scenario. The area of water bodies did not change during this monitoring period, which as seen in Table 3.16 is 122.1 ha.

The project used the approach set out in the VCS methodology VM0007 modules BL-PEAT and M-PEAT to quantify emissions by using the Equation 3.8.

$$\text{GHG}_{\text{peatditch-WPS},i,t} = \text{GHG}_{\text{peatditch-CO}_2,i,t} + \text{GHG}_{\text{peatditch-CH}_4,i,t} \quad (3.8)$$

Where:

$\text{GHG}_{\text{peatditch-WPS},i,t}$	GHG emissions from ditch and other open water stratum i at year t in the project scenario (t CO ₂ e ha ⁻¹ yr ⁻¹)
$\text{GHG}_{\text{peatditch-CO}_2,i,t}$	Emission of CO ₂ from ditch and open water stratum i at year t in the project scenario (t CO ₂ e ha ⁻¹ yr ⁻¹)
$\text{GHG}_{\text{peatditch-CH}_4,i,t}$	Emission of CH ₄ from ditch and open water stratum i at year t in the project scenario (t CO ₂ e ha ⁻¹ yr ⁻¹)
$i: 1, 2, 3 \dots M_{\text{WPS}}$	strata in the project scenario (unitless)
$t: 1, 2, 3, \dots t^*$	time elapsed since the project start (yr)

The projected annual GHG emissions from water bodies in peatlands for the project scenario are presented in Table 3.18.

Table 3.18. Annual Project CO₂ and CH₄ Emissions from Ditches (tCO₂e) across the monitoring period (2021, 2022 and 2023).

Vintage Year	Project Ditch Emissions (tCO ₂ e)		
	CO ₂	CH ₄	Total
2021	23.3	6.2	29.6
2022	23.4	6.3	29.6
2023	45.9	12.3	58.2
Total	93	25	117

3.2.3 Leakage Emissions (VCS, 2.5, 3.2, 3.6, 3.15, 4.3)

Applicable leakage modules were determined according to requirements in the VCS methodology VM0007 REDD+ MF. As described in the PD, the baseline activity is identified as planned deforestation and peatland drainage as a result of conversion to industrial acacia (pulp wood) plantations. The project is therefore categorised as Avoiding Planned Deforestation (APD) in combination with Conservation of Undrained and Partially drained Peatland (CUPP) and Rewetting of Drained Peatland (RDP) activities. As a consequence, potential sources of leakage emissions stem from the displacement of planned deforestation activities and ecological leakage due to possible alterations of mean annual water table depth in adjacent areas. These potential sources are covered in the VCS Methodology VM0007 Modules LK-ASP and LK-ECO respectively, which are therefore identified as the applicable modules for the quantification of total leakage emissions.

3.2.3.1 Estimation of emissions from activity shifting for avoiding planned deforestation and planned degradation

Activity shifting leakage was monitored against the leakage baseline defined in the PD (Section 3.2.4). As per the methodology, and the steps defined in the PD document, ‘area deforested by the baseline class of agents through the years in which planned deforestation was forecast to occur’ ($A_{defLK,i,t}$) was monitored for 2021, 2022 and 2023 and compared to the baseline leakage scenario (Step 3, as per LK-ASP).

To calculate $A_{defLK,i,t}$, the total area deforested in pulp and paper concessions in Indonesia during the monitoring period was calculated. Official data on active pulp and paper concessions

in Indonesia was obtained from the Ministry of Forestry. The most up to date available data was used, from April 2023. The downloaded shapefile contains the spatial delineation of the concessions, the year each concession was granted, and the company that owns it. Only PBP HHT concessions were used for the analysis, totalling active 302 concessions.

The total annual deforested area across all concessions during the monitoring period was quantified using annual tree cover loss data from (Hansen et al., 2013), available on Global Forest Watch. This dataset was considered the most suitable for this analysis given the large scale of the analysis, the study period, and the quasi-permanent cloud coverage in this region. The data were extracted and analysed on the Google Earth Engine platform, investigating forest cover loss ($A_{defLK,i,t}$) in areas with forest cover greater than 80%. A reference to the source script used for this analysis will be provided to the verification body.

Areas of deforestation and leakage were determined using equation 3.9. Results are shown in Table 3.19.

$$LKA_{planned,i,t} = A_{defLK,i,t} - NewR_{i,t} \quad (3.9)$$

Where:

$LKA_{planned,i,t}$	The area of activity shifting leakage in stratum i in year t (ha)
$NewR_{i,t}$	New calculated forest clearance by the baseline agent of the planned deforestation in stratum i in year t where no leakage is occurring (ha)
$A_{defLK,i,t}$	The total area of monitored deforestation by the baseline agent of the planned deforestation in stratum i in year t (ha)
I	1, 2, 3, ... M strata (unitless)
T	1, 2, 3, ... t^* time elapsed since the start of the project activity (years)

Table 3.19. Area of activity shifting leakage in 2021, 2022, 2023

Year	$NewR_{\{i,t\}}$ (ha)	$A_{defLK_{\{i,t\}}}$ (ha)	$LKA_{\{planned,i,t\}}$ (ha)
2021	332,045.73	78,894.79	- 253,150.93
2022	348,765.87	81,932.16	- 266,833.71
2023	365,486.01	124,793.57	- 240,692.44

Since this analysis confirmed there was no leakage throughout the monitoring period (all values of $LKA_{planned,i,t}$ in Table 3.19 are negative), Steps 4 through 7 as described in LK-ASP were not required.

3.2.3.2 Estimation of emissions from ecological leakage (LK-ECO)

No ecological leakage occurred during this monitoring period. The design of the project's rewetting activities ensures the absence of leakage, please refer to PD Section 3.2.4.2.

Most of the project area is undrained and hence does not need rewetting or restoration. The rewetting activities focus on the areas where there is drainage canals constructed prior to the project start date. These areas are surrounded by undrained peatland and are small enough to ensure that no alteration of the mean water table depth outside the project area will occur. Besides, water table levels are mainly affected by precipitation, and therefore differences in water table from year to year are highly due to the variation on rainfall. Moreover, all these canals connect to the main rivers (Katingan and Mentaya rivers) and are relatively close to the coastal area and therefore the influence of the tides is expected to have a greater impact on the water table depth than the small scale canal blockings built inside the project area. Fluctuation of water levels will be highly related to precipitation and tidal influence, and unlikely linked to the rewetting activity.

In addition, land in the vicinity of the canal block positions is all unproductive land (bare land) covered with shrubs and native peat swamp species. Change in vegetation productivity will not occur as these types of vegetation are highly adaptable with inundated conditions on peat swamp areas.

Before constructing any canal block that could impact areas outside the project area, surveys are conducted to determine whether the local population uses the canal (for example, for transportation, agriculture, fishing, or other activities). If no such uses are identified, a full block is designed and built. However, if any uses are found, the blocks are constructed with spillways to ensure that these activities are not affected.

Monitoring of ecological leakage only takes place on rewetted canals that have hydrological connectivity to water bodies outside the project area. It is monitored through the installation of staff gauges and monitoring wells to assess hydrological impacts (flood and drought). During this monitoring period, the project implemented rewetting on these following canals: Sekawan canal (2021), Sasuai canal (2021), Tatah Idak canal (2022), Gery canal (2023) and Rasau canal (2023). All these canals were already present before the commencement of the project, built by the local community mostly for access into the forest. Due to social dynamics, the land ownership around these canals was unknown, thus, the installation of a water dipwell outside the project area could not be undertaken on most of the canals.

The majority of these canals are connected with the Hantipan canal or other water bodies within the project area. Of the 34 blocks constructed, 15 are outside the project area.

Table 3.20 is Table 5.1 from VDM0044; it has been used to assess the possible ecological leakage as a result of the rewetting activities.

Table 3.20 Processes Associated with Ecological Leakage Outside Project Boundary and Related Criteria for their Avoidance

Ecological leakage process outside project boundary	Avoidance criterion (pertaining to conditions outside the project boundary)
Lowering water table that causes increased soil carbon oxidation	Maintain wetland conditions (e.g., converting from impounded water to a wetland does not cause soil oxidation)
Lowering water table that causes increased N ₂ O emissions	No conversion of open water to non-seagrass wetland
Raising water table that causes increased CH ₄ emissions	No conversion of non-wetland to wetland
Raising water table that causes decreased vegetation production that causes decreased new soil carbon sequestration	No causation of vegetated to non-vegetated (or poorly vegetated) conditions

The rewetting activities do not lower the water table depth outside the project areas, as the aim is to rewet and raise the WTD to natural conditions. Therefore, the first 3 points of Table 5.1 from VDM0044 are non-applicable. Only the fourth point (“Raising water table that causes decreased vegetation production that causes decreased new soil carbon sequestration”) is applicable.

All areas affected by rewetting outside the project area, except for those around the Sekawan canal, are non-forest areas covered by shrubs and native peat swamp species. The raise of WTD will not negatively affect this vegetation as they are highly adapted to inundated conditions on peat swamp areas.

The only blocked canal during this monitoring period that could have an effect on ecological leakage is Sekawan. The blocks were built between 2020 and 2021, and consist of a total of 7 blockings (3 inside the project area and 4 outside). In the area around this particular canal there are some small holding agricultural activities (oil palm); for this reason, spillways have been installed in all 7 blockings (therefore, it is not a complete block), allowing the control of the water flow and ensuring therefore that they do not affect the agricultural activities and that no ecological leakage takes place. In the Sekawan canal, dipwells were successfully installed inside and outside the project area. The data consistently show that the water table depth was lower within the project area than outside it, and that there was no significant change in water table depth outside the project area after the canal was blocked. This indicates that the canal blockings did not affect WTD beyond the project boundaries.

3.2.4 GHG Emission Reductions and Carbon Dioxide Removals (VCS, 3.15, 4.1)

3.2.4.1 Uncertainty Analysis

Table 3.21 shows the total uncertainty values extracted using equation 3.10.

Table 3.21 Total GHG emissions, absolute uncertainty, and relative uncertainty for REDD and WRC, project (WPS) and baseline (BSL) components.

	Total GHG emissions (tCO ₂ e)	Absolute Uncertainty (tCO ₂ e)	Relative uncertainty (%)
BSL-WRC	423,057,149.7	7,197,255.8	1.7
WPS-WRC	10,257,808.5	7,715,165.5	75.2
BSL-REDD	11,649,593.1	2,544,500.9	21.8
WPS-REDD	787,399.0	-	-

Let:

- $U_{\text{REDD BSL},t^*} = \text{Uncertainty}_{\text{REDD BSL},t^*} \times \Delta C_{\text{BSL-REDD},t^*}$
- $U_{\text{REDD WPS}} = \text{Uncertainty}_{\text{REDD WPS}} \times \Delta C_{\text{WPS-REDD},t^*}$
- $U_{\text{WRC BSL},t^*} = \text{Uncertainty}_{\text{WRC BSL},t^*} \times GHG_{\text{BSL-WRC},t^*}$
- $U_{\text{WRC WPS},t^*} = \text{Uncertainty}_{\text{WRC WPS},t^*} \times GHG_{\text{WPS-WRC},t^*}$

$$NER_{\text{REDD+ ERROR}} = \frac{\sqrt{U_{\text{REDD BSL},t^*}^2 + U_{\text{REDD WPS}}^2 + U_{\text{WRC BSL},t^*}^2 + U_{\text{WRC WPS},t^*}^2}}{\Delta C_{\text{BSL-REDD},t^*} + \Delta C_{\text{WPS-REDD},t^*} + GHG_{\text{BSL-WRC},t^*} + GHG_{\text{WPS-WRC},t^*}} \quad (3.10)$$

Where:

- $NER_{\text{REDD+ ERROR}}$: Cumulative uncertainty for the REDD+ (REDD and WRC) project activities up to year t^* (%).
- $\text{Uncertainty}_{\text{REDD BSL},t^*}$: Cumulative uncertainty in the REDD baseline scenario up to year t^* (%).
- $\text{Uncertainty}_{\text{REDD WPS}}$ = Total uncertainty in the REDD project scenario (%).
- $\text{Uncertainty}_{\text{WRC BSL},t^*}$ = Cumulative uncertainty in the WRC baseline scenario up to year t^* (%).
- $\text{Uncertainty}_{\text{WRC WPS},t^*}$ = Cumulative uncertainty in the WRC project scenario up to year t^* (%).
- $\Delta C_{\text{BSL-REDD},t^*}$ = Net GHG emissions in the REDD baseline scenario up to year t^* (t CO₂e).
- $\Delta C_{\text{WPS-REDD},t^*}$ = Net GHG emissions in the REDD project scenario up to year t^* (t CO₂e).
- $GHG_{\text{BSL-WRC},t^*}$ = Net GHG emissions in the WRC baseline scenario up to year t^* (t CO₂e).

- $GHG_{WPS-WRC,t^*}$ = Net GHG emissions in the WRC project scenario up to year t^* (t CO₂e).
- t^* : Time elapsed since the project start (year).

The total uncertainty error in the project was calculated to be **2.43%**. Considering the 15% uncertainty threshold, no VCU deductions were made due to uncertainty.

3.2.4.2 Total net GHG emission reductions of the REDD project activity

We use Equation 3.11 to calculate emissions reductions and Verified Carbon Units (VCUs) based on the components of baseline, project, and leakage emissions (VM0007 v1.7).

$$NER_{REDD} = GHG_{BSL-REDD} - GHG_{WPS-REDD} - GHG_{LK-REDD} \quad (3.11)$$

Where:

- NER_{REDD} = Total net GHG emission reductions of the REDD project activity up to year t^* (tCO₂e)
- $GHG_{BSL-REDD}$ = Net GHG emissions in the REDD baseline scenario up to year t^* (tCO₂e)
- $GHG_{WPS-REDD}$ = Net GHG emissions in the REDD project scenario up to year t^* (tCO₂e)
- $GHG_{LK-REDD}$ = Net GHG emissions due to leakage from the REDD project activity up to year t^* (tCO₂e)

Net GHG emission reductions from REDD project activities are calculated by subtracting project emissions and emissions due to leakage from baseline emissions (see Table 3.22).

Table 3.22 Annual greenhouse gas emissions (baseline, project, and leakage emissions) and estimated emission reductions (tCO₂e) for the REDD component (2021-2023).

Vintage Year	Estimated baseline emissions (tCO ₂ e)	Estimated project emissions (tCO ₂ e)	Estimated leakage emissions (tCO ₂ e)	Estimated emission reductions (tCO ₂ e)
2021	805,119.5	136,313.5	-	668,805.9
2022	830,269.0	152,763.9	-	677,505.2
2023	857,627.6	136,270.2	-	721,357.4
Total	2,493,016	425,348	-	2,067,669

3.2.4.3 Total net GHG emission reductions of the WRC project activity

We use Equation 3.12 to calculate emissions reductions and Verified Carbon Units (VCUs) based on the components of baseline, project, and leakage emissions (VM0007 v1.7).

$$NER_{WRC} = GHG_{BSL-WRC} - GHG_{WPS-WRC} - GHG_{LK-WRC} \quad (3.12)$$

Where:

- NER_{WRC} = Total net GHG emission reductions in the WRC project up to year t^* (tCO₂e)
- $GHG_{BSL-WRC}$ = Net GHG emissions in the baseline scenario up to year t^* (tCO₂e)
- $GHG_{WPS-WRC}$ = Net GHG emissions in the project scenario up to year t^* (tCO₂e)
- GHG_{LK-WRC} = Net GHG emissions due to leakage from the WRC project activity up to year t^* (tCO₂e)

Net GHG emission reductions from WRC project activities are calculated by subtracting project emissions and emissions due to leakage from baseline emissions (see).

Table 3.23 Annual projected greenhouse gas emissions (baseline, project, and leakage emissions) and estimated emission reductions (tCO₂e) for the WRC component (2021-2023).

Vintage Year	Estimated baseline emissions (tCO ₂ e)	Estimated project emissions (tCO ₂ e)	Estimated leakage emissions (tCO ₂ e)	Estimated emission reductions (tCO ₂ e)
2021	6,170,301.1	372,238.2	-	5,798,062.9
2022	6,462,151.8	372,645.9	-	6,089,505.9
2023	6,606,862.9	379,023.3	-	6,227,839.6
Total	19,239,316	1,123,907	-	18,115,408

3.2.4.4 Calculation of Verified Carbon Units

State the non-permanence risk rating (%)	14
Has the non-permanence risk report been attached as either an appendix or a separate document?	☒ Yes ☐ No
For ARR and IFM projects with harvesting, state, in tCO ₂ e, the Long-term Average (LTA).	n/a
Has the LTA been updated based on monitored data, if applicable?	☒ Yes ☐ No

State, in tCO ₂ e, the expected total GHG benefit to date.	55,306,737
If a loss occurred (including a loss event or reversal), state the amount of tCO ₂ e lost:	374,277.51

A non-permanence risk assessment was carried out in accordance with the most recent AFOLU Non-Permanence Risk Tool v.4.2 and the Risk Assessment Calculator. The resulting risk rating and non-permanence risk buffer is 14%. This assessment primarily addresses the risk to climate benefits but is equally applicable to the risks associated with community and biodiversity benefits. The annual buffer withholding has been split proportionally between the estimated reductions and removals (Table 3.24).

Net GHG emission reductions from REDD+ project activities are calculated by subtracting project emissions and emissions due to leakage from baseline emissions (see Table 3.24). Net GHG emission reductions from REDD and WRC activities are calculated using Equation 3.13.

$$NER_{\text{REDD+}} = NER_{\text{REDD}} + NER_{\text{WRC}} \quad (3.13)$$

Where:

- NER_{REDD} = Total net GHG emission reductions of the REDD project activity up to year t^* (tCO₂e)
- NER_{WRC} = Total net GHG emission reductions of the WRC project activity up to year t^* (tCO₂e)

Table 3.24 Annual calculation of total verified carbon units (tCO₂e) (2021 – 2023).

Vintage Year	Estimated baseline emissions (tCO ₂ e)	Estimated project emissions (tCO ₂ e)	Estimated leakage emissions (tCO ₂ e)	Estimated buffer pool allocation (tCO ₂ e)	Estimated reduction VCU (tCO ₂ e)	Estimated removal VCU (tCO ₂ e)	Estimated total VCU issuance (tCO ₂ e)
2021	6,975,420	508,552	-	905,362	5,561,507	-	5,561,507
2022	7,292,421	525,410	-	947,381	5,819,630	-	5,819,630
2023	7,464,491	515,293	-	972,888	5,976,309	-	5,976,309
Total	21,732,332	1,549,255	-	2,825,631	17,357,446	-	17,357,446

Table 3.25 shows the comparison between ex-ante GHG emission reductions and removals and the achieved reductions and removals for this monitoring period. The difference between them is very small, 1.30%, 1.48%, 1.22% for 2021, 2022 and 2023 respectively. These small differences are a consequence of the increased project emissions due to illegal logging

(Section 3.2.3.3.1). Some illegal logging is still happening in the west side of the project area. The project has implemented strong measures to stop these illegal activities (See Section 5.1).

Table 3.25 Estimated ex-ante VCUs for the monitoring period, showing comparison between projected and actual emission reductions and removals.

Vintage period	Ex-ante estimated reductions/removals	Achieved reductions/removals	Percent difference	Explanation for the difference
01-Jan-2021 to 31-Dec 2021	5,634,513	5,561,507	1.30%	Deforestation and forest degradation
01-Jan-2022 to 31-Dec 2022	5,907,134	5,819,630	1.48%	Deforestation and forest degradation
01-Jan-2023 to 31-Dec 2023	6,050,035	5,976,309	1.22%	Deforestation and forest degradation
Total	17,591,682	17,357,446		

3.3 Optional Criterion: Climate Change Adaptation Benefits

3.3.1 Activities and/or processes implemented for Adaptation (CCB, GL1.3)

The project recognises that project zone communities are susceptible to potential climate change impacts due to their reliance on healthy forests, riverine, and peatland ecosystems in the project area. While some negative effects of climate change are unavoidable and outside the project's control, the Katingan Mentaya Project has initiated actions to bolster community and biodiversity resilience by implementing adaptation options through a variety of project activities.

The project's causal model integrates activities and strategies aimed at promoting resilience, sustainability, and long-term well-being. Key activities include land conservation, forest regeneration, public health improvements, and participatory planning. Strategies implemented to enhance adaptation encompass avoiding peatland drainage, deforestation prevention, habitat restoration, fire prevention, species protection, and reducing hunting pressures. Participatory planning with local communities focuses on climate-smart agriculture, drought-resistant rice varieties, alternative livelihoods, and environmental education to support adaptation and strengthen community resilience. Alternative livelihoods, environmental

education, rainwater harvesting and water recycling and improved public health are other strategies considered in participatory planning processes. In addition, annual monitoring and assessment of the project's impact on forest ecosystems, water resources, and biodiversity are conducted to inform adaptive management strategies and ensure continuous improvement.

Overall, the project's activities and processes during the monitoring period have effectively bolstered the adaptive capacity of ecosystems and human communities in the face of climate change. By adopting a holistic and integrated approach to adaptation, which encompasses forest conservation, landscape planning, and biodiversity protection, including freshwater ecosystems, the project enhances ecosystem resilience. This comprehensive strategy not only preserves local culture, traditions, and economic activities but also ensures a more sustainable future for all involved.

Those activities most relevant to climate change adaptation, and the causal relationship between the activity and the adaptation benefit, are summarised below in Table 3.26.

Table 3.26. Causal relationship between project activities and climate adaptation benefits.

Activity	Components	Adaptation Benefits
Ecosystem protection and forest regeneration	Avoided peatland drainage	Peatland conservation and rewetting in the Katingan Mentaya Project, have already resulted in important adaptation benefits such as water regulation and reduced soil erosion.
	Avoided planned deforestation	
	Habitat restoration	The project is thus ensuring better water regulation for aquatic ecosystems downstream, particularly for key estuary ecosystems downstream of the Katingan and Mentaya rivers.
	Reforestation	
	Fire prevention	Water regulation in forests and peatlands also likely benefit local communities and their economic activities such as rice production.
	Habitat and species protection	
	Reduction in hunting pressures	Mitigation of saltwater intrusion, which is fundamental for freshwater ecosystems and agriculture.

		The project is also helping to improve the water quality downstream by reducing impacts on human health and biodiversity. These benefits are having positive impacts in the local terrestrial and freshwater biodiversity. The project is also helping to mitigate the impacts of sedimentation in the management of rivers and navigation services further downstream.
Improved Public health and sanitation services	Improved access to clean water and sanitation facilities Improved access to public health care services	Reduced soil erosion and sedimentation is helping to improve the water quality downstream of the project area, along the Katingan and Mentaya Rivers, both for human communities and their agricultural activities. The project is helping to reduce treatment costs and infrastructure management costs and reducing the silting of rivers and saltwater intrusion in downstream estuaries and coastal ecosystems.

Summary of Climate Adaptation Benefits

The Katingan Project is now addressing several potential impacts of climate change, as outlined in the validation report. The project has already begun to yield tangible adaptation benefits, such as enhancing water regulation by conserving and restoring forests and peatlands along the Katingan and Mentaya rivers, and downstream estuary ecosystems. This has resulted in significant climate adaptation and biodiversity conservation benefits.

Additionally, the project has contributed to the stabilisation of soil erosion, consequently reducing the influx of sediments from the project region into the Katingan and Mentaya rivers. Both water regulation and mitigated soil erosion have likely contributed to mitigate saltwater intrusion with favourable consequences for agricultural activities and estuary ecosystems and biodiversity.

Furthermore, project operations have successfully mitigated additional CO₂ emissions resulting from soil carbon losses caused by soil erosion. Moreover, water quality issues within the project area have begun to improve because of increased forest cover and peatland conservation.

These benefits suggest the project can reduce water treatment and sanitation costs downstream, leading to economic savings.

Socially, the project is enhancing the availability of high-quality drinking water and water for agricultural purposes, positively impacting human health and economic activities. Enhanced water quality, regulation and mitigation of saltwater intrusion also provide benefits for local terrestrial and aquatic biodiversity. Lastly, by mitigating soil carbon losses and countering natural disturbances such as fires, the project has contributed to increased climate change resilience, thus limiting further warming and ensuring permanence of emissions reductions. Table 3.27 shows a summary of adaptation benefits already provided by the project according to modelling results subsequently presented in the *Monitoring of Adaptation Benefits* section.

Table 3.27. List of Climate Adaptation Outcomes of the Project corresponding to the period 2020 – 2023

Type	Description
Hydrological Resilience	Improved water regulation by conservation and recovery of tropical peatlands, particularly along Katingan and Mentaya rivers and their downstream estuaries.
	Increased water quality especially in proximity to towns such as Kasongan, Glinggang, Kualaampit and Telaga, where waste pollution and contamination from agricultural activities have been reported. The region of Setiroek downstream has also benefited, especially along river estuaries.
Soil Conservation	Soil erosion stabilisation prevents additional CO ₂ losses from carbon flowing in sediments.
Water Quality	The project has helped to enhance water quality by reducing human impact on water quality indicators such as the Human Footprint on Water Quality (HFWQ).
Economic	Positive economic impacts, as the project is safely contributing to the reduction of water sanitation costs. It is also contributing to a more reliable water supply for agriculture downstream by ensuring a more regular water regime that mitigates saltwater intrusion.
Climate Resilience	The project is contributing to climate change adaptation through a more stable hydrological regime and carbon storage maintenance in soils resulting from a more natural soil erosion regime.

	Greater resilience to climate change, limiting further warming from soil carbon losses and natural disturbances, such as fires. This outcome is ensuring the permanence of emission reductions by the project.
Biodiversity, Communities	Interconnected environmental, social, and economic co-benefits through better land management.
	Important freshwater conservation outcomes especially along key rivers and estuary ecosystems.

3.3.2 Monitoring of Adaptation Benefits

The Katingan Mentaya Project was evaluated using the Costing Nature Policy Support System (Mulligan, 2024), which considered four years of vegetation cover data from 2020 to 2023. This report uses three years of monitoring data (2021-2022 and 2023) to assess the project's progress and effectiveness. The status of forest cover in 2020 serves as the baseline for the new crediting period. Each year's vegetation cover status was used to create land cover scenarios within the Costing Nature system, allowing us to gauge the project's impact from 2020.

It is crucial to acknowledge that while certain variables may exhibit minimal changes between 2020 and 2023, the analysis encompassed a three-year period to account for possible fluctuations in hydrological functions resulting from land cover changes. Despite potential delays in the responses of specific variables, this extensive analysis facilitates a comprehensive assessment of the project's overall impact.

The analysis was performed at two different spatial scales to provide a complete understanding of the project's hydrological benefits. First, a 1-kilometer scale analysis was conducted to contextualise the project's impact within the broader Central Kalimantan district of Indonesia, which continues to experience deforestation challenges. Second, a more detailed analysis at a 1-hectare project scale to closely examine the specific changes and improvements relative to the 2020 forest status. This multi-scale approach enabled a thorough evaluation of the project's impact and facilitated the recommendation of additional targeted climate adaptation measures within the project area and project zone.

The project's outcomes were assessed in terms of ecosystem services that facilitate climate adaptation, such as water regulation, erosion control, and their impacts on water quality and availability for human consumption and agricultural development downstream. This report also considers the role of the project's conservation and recovery efforts in improving water quality and regulation for downstream communities and biodiversity.

Furthermore, the analysis incorporates the potential long-term effects of the project's interventions on downstream communities and ecosystems, considering the complex interplay between climate change, land cover modifications, and hydrological processes. This comprehensive approach allows for a more nuanced understanding of the project's impact and the potential benefits it provides in terms of climate resilience and adaptation for local communities and biodiversity.

Figure 3.14 depicts the Katingan Mentaya Project region and its influence along the lower sections of the Mentaya and Katingan rivers that run parallel to the project area. This geographical confluence highlights the potential of the project to provide broad-scale climate adaptation benefits to these important freshwater and coastal ecosystems.

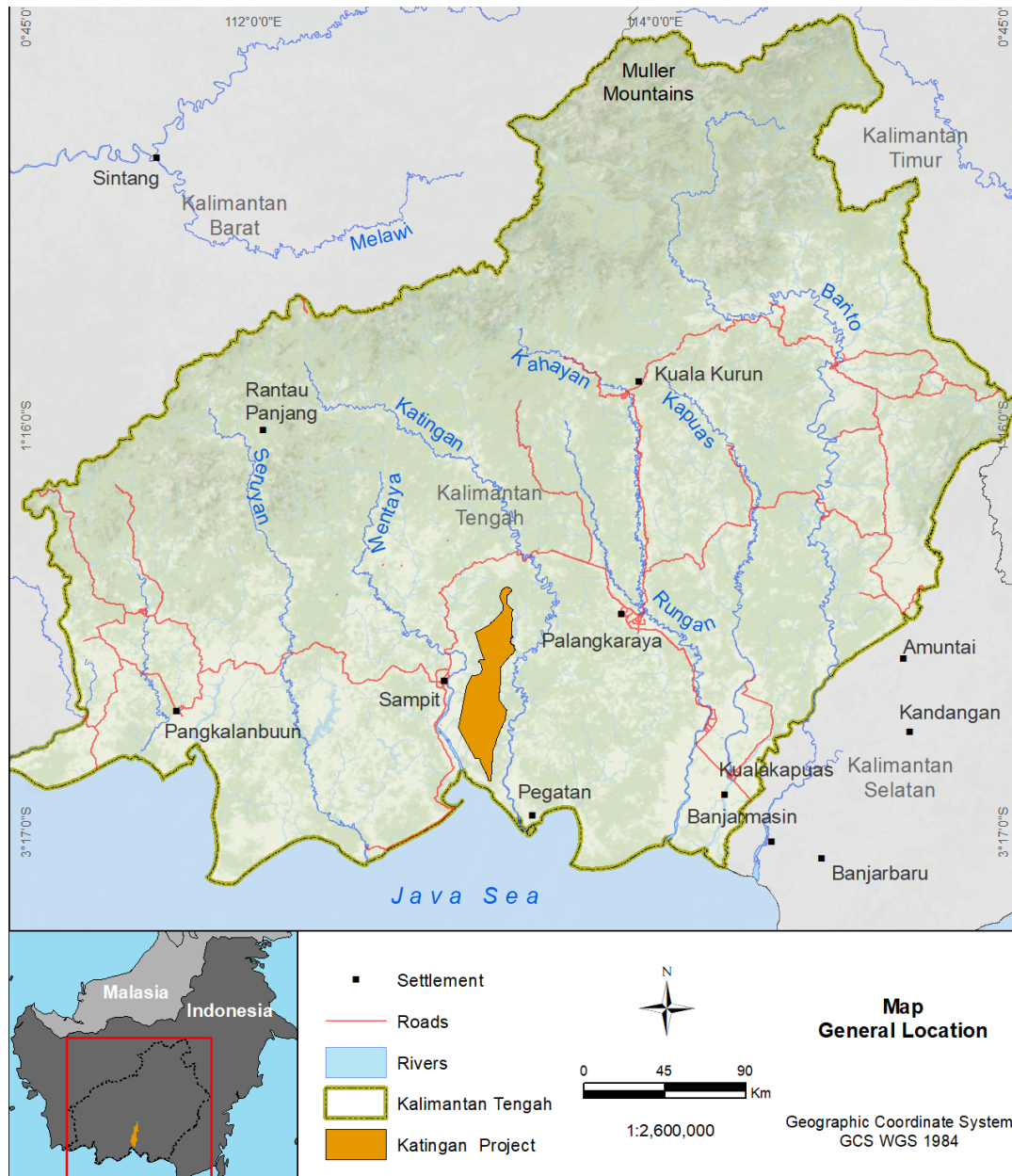


Figure 3.14. Central Kalimantan district and location of the Katingan Mentaya Project. The project is located between the lower sections of the Mentaya and Katingan river basins and provides water regulation services to the Katingan estuary. This highlights the potential of the project to provide broad-scale climate adaptation benefits to these important freshwater and coastal ecosystems.

Hydrological Modelling

The Costing Nature policy support system was employed to model the hydrological effects of forest conservation and regrowth within the Katingan Mentaya Project. The specialised eco-hydrological model, Costing Nature, was developed to evaluate ecosystem services under various climate and land use scenarios (Mulligan, 2024). This model can simulate changes in water supply and stress, potentially influencing climate adaptation strategies. The model operates at a

spatial resolution of 1 kilometre, 90 meters, and 30 meters to capture detailed hydrological patterns and impacts.

The model establishes the region's baseline hydrology and facilitates the creation of scenarios involving land use and cover changes, as well as their interaction with ecological factors. This makes it particularly suitable for understanding the role of ecosystems in delivering climate adaptation benefits for both human communities and biodiversity. As mentioned earlier, the model was utilised to simulate the annual hydrology of the entire Central Kalimantan district at a 1-kilometer spatial scale, enabling an examination of the potential climate adaptation benefits provided by the Katingan Mentaya Project in relation to the eco-hydrological status of the entire district.

Additionally, the model was run at a 1-hectare scale within the project area to better comprehend the impact of conservation actions promoted by the project and to inform future localised adaptation efforts. The climate data for rainfall and temperature utilised for model parameterisation remained consistent with the Project Baseline, ensuring that any observed adaptation benefits were solely attributed to forest conservation and regrowth. Results also allow us to identify areas where additional conservation activities are needed to increase climate resilience. As a result, the findings of this study underscore the role of targeted conservation interventions in enhancing the climate resilience of both the project area and its project zone.

Land Cover Change Scenarios

Land cover scenarios for the project spanning 2020 to 2023 were developed using a 30-meter resolution remote sensing analysis, as detailed in Section 3.1.3 (Monitoring Plan). Four primary classes were considered in the maps and incorporated into the Costing Nature model: forest, water, non-forest, and no data. To minimise the impact of cloud cover on the analysis, scenes contaminated by clouds were replaced with Global Forest Watch data for forest and non-forest categories, ensuring compatibility with the Costing Nature model for each year under consideration. Section 3.1.3 (Monitoring Plan) presents the forest cover changes calculated for this monitoring report, showcasing the methods employed.

Figure 3.15 depicts the change in forest cover within the Central Kalimantan District between 2020 and 2023, with a specific focus on the project area. Despite the ongoing forest loss observed across the district, the Katingan Mentaya Project area has successfully maintained and recovered its forest cover. Consequently, the regional analysis conducted at a 1-kilometer spatial scale aims to demonstrate the relatively greater stability of hydrological functions within the project area compared to surrounding regions, potentially contributing to enhanced climate resilience and permanence of emissions reductions within the project area and downstream zones. Section 3.3.2b (Project Level Outcomes) provides a more detailed, high-resolution analysis of the project area at a 1-hectare spatial scale.

Over the three-year period, the Central Kalimantan district witnessed a substantial decline in forest cover, amounting to approximately 271,000 hectares (GFW, 2024). This deforestation was

observed throughout the district but was more prominent in the unprotected areas to the south, along the Java Sea. Significant forest losses were also detected to the west of the Katingan Mentaya Project area, particularly along the Mentaya River and north, south and west of Sampit city. Notably, even protected areas were not immune to deforestation, with the national parks of Tanjung Puting and Sebangau experiencing considerable impacts (Figure 3.15). These findings underscore the need for continued monitoring and conservation efforts to mitigate the ongoing deforestation in the region.

Despite considerable deforestation in the Katingan region, the project has continued to successfully preserve crucial peatlands along a 100-kilometer stretch of a hydrologically distinctive area. This area serves to drain and maintain water tables, connecting the lower regions of the Katingan and Mentaya rivers, while preventing damaging saltwater intrusion (Figure 3.15).

By safeguarding the hydrological services downstream of these two significant river basins, the project offers essential climate adaptation benefits for biodiversity, including freshwater biodiversity, and local communities within the Central Kalimantan district. Similarly, peatlands conservation guarantees the stability of the irrecoverable carbon within these extremely rich carbon ecosystems (Noon, et al., 2021). In the following sections, we will examine any regional climate adaptation implications of the project in greater detail.

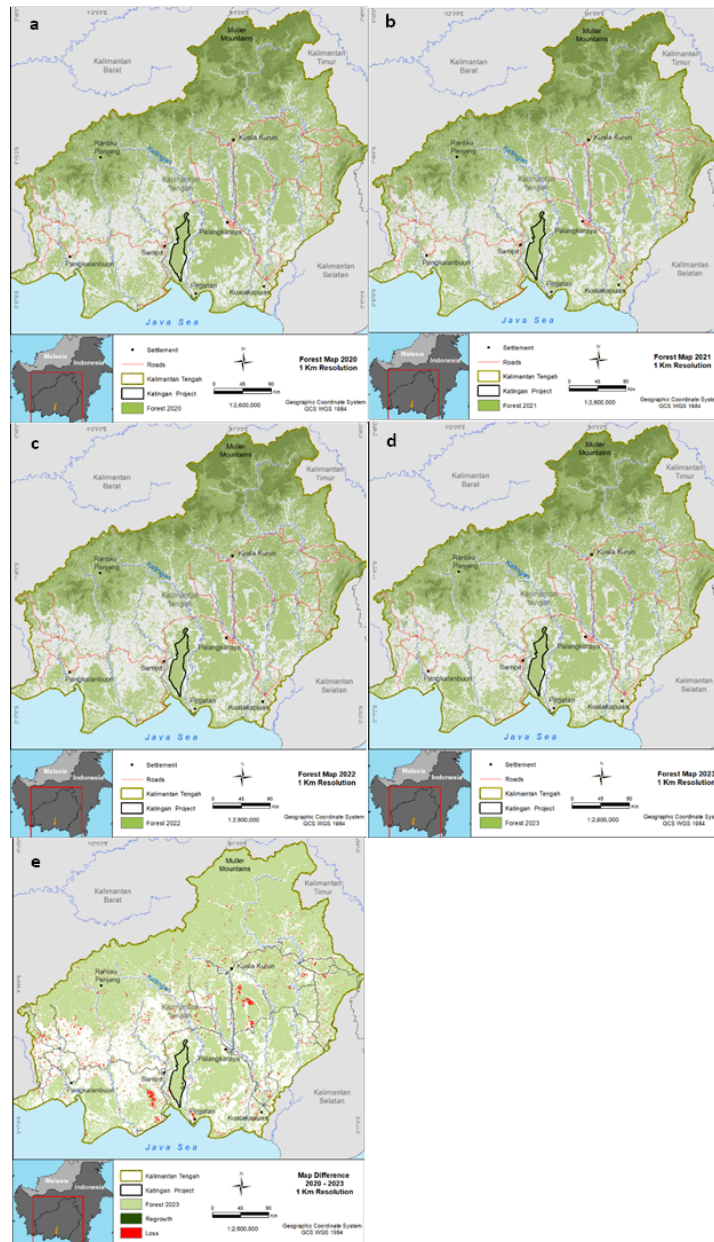


Figure 3.15. Forest cover within the Central Kalimantan District between 2020 and 2023 with a detail of the project area. a. Forest map 2020. b. Forest map 2021. c. Forest map 2022. d. Forest map 2023. e. Difference in forest cover between 2023 and 2020 across the central Kalimantan district.

Soil Erosion and Transport

Soil erosion was modelled using the Costing Nature Policy Support System, which focuses on slope erosion processes such as sheet erosion (Saenz et al., 2014). The project utilised forest cover data with a 30-meter resolution to evaluate the percentage of soil covered by vegetation, as outlined in the Monitoring Plan (section 3.1.3). The increase in vegetation-covered soil simulates a reduction in soil erosion by providing better protection against sheet erosion caused by runoff. Conversely, it models erosion increases when vegetation cover is reduced. Additional

factors controlling soil erosion, such as terrain slope, wind exposure, surface runoff, and soil types, were accounted for in the model using its comprehensive database (Mulligan, 2024).

Human Footprint on Water Quality (HFWQ)

The Human Footprint on Water Quality (HFWQ) is represented by the percentage of runoff that falls as rainfall and passes through potentially contaminated land uses upstream. It is calculated by accumulating downstream runoff from both polluting and non-polluting land uses, with the polluted runoff expressed as a proportion of the total runoff (Mulligan, et al., 2020). In the context of the project, the HFWQ signifies two key outcomes: first, the improved maintenance of water quality due to reduced deforestation, and second, the decrease in water contamination by sediments resulting from reduced erosion associated with forest recovery.

Climate Adaptation Outcomes

a. Regional Outcomes

- Water Balance (mm/year)

As mentioned in the validation report and illustrated in Figure 3.16a, the water balance across Central Kalimantan districts varies from around 4327 mm per year in the northern regions near the Muller Mountains and bordering areas with Kalimantan Barat and Kalimantan Timur districts, to significantly lower levels near the coastal areas to the south in the Java Sea, reaching approximately 1122 mm per year. An examination of land use change in Central Kalimantan between 2020 and 2023 reveals that several isolated areas have experienced temporary increases in surface water balance due to reduced evapotranspiration resulting from the loss of vegetation. This impact of deforestation is more significant south of the city of Sampit and east of the city of Kualakurun (Figure 3.16b). Similarly, areas within the Katingan Mentaya Project area have experienced short term reductions in water balance, which signals an increased water use by recovering forest vegetation.

However, short-term increases in water balance due to deforestation should not be viewed as an indicator of improved water yield, as they often lead to long-term reductions in water availability. This is because rapid runoff can negatively impact dry season flows (Peña-Arancibia, et al., 2019), and exacerbate flash flooding (Bradshaw, et al., 2007; Peña-Arancibia, et al., 2019). Also, decreased evapotranspiration after deforestation can affect rainfall and atmospheric water circulation particularly in Borneo (McAlpine, et al., 2018). What's more, the loss of trees in sections subject to cloud immersion (TMCs) can also reduce water yield (Bruijnzeel, et al., 2010). Although a comprehensive analysis of these factors would require complex terrestrial-atmospheric models beyond the scope of this report, it is reasonable to anticipate decreases in water availability following forest loss and subsequent improvements when forests are restored and natural hydrological regimes are reestablished, as it is taking place in the Katingan Mentaya Project.

Nevertheless, despite localised variations, the average water balance change between 2020 and 2023 across the Central Kalimantan district remained neutral, with an average increase of only 0.2%. Similar neutral changes were observed within the Katingan Mentaya Project area. Therefore, forest conservation and recovery efforts by the project are likely helping to maintain and restore natural and resilient hydrological regimes downstream of the Katingan and Mentaya Rivers. To further investigate these impacts and better understand the hydrological effects of forest protection at the project scale, a high-resolution, one-hectare scale analysis was performed and is presented in Section B: Project Level Outcomes. Figure 3.16 showcases the water balance across the Central Kalimantan district in 2020 and the potential percentage changes between 2020 and 2023. The Katingan Mentaya Project boundary is added to illustrate that the changes in the project area are mostly neutral.

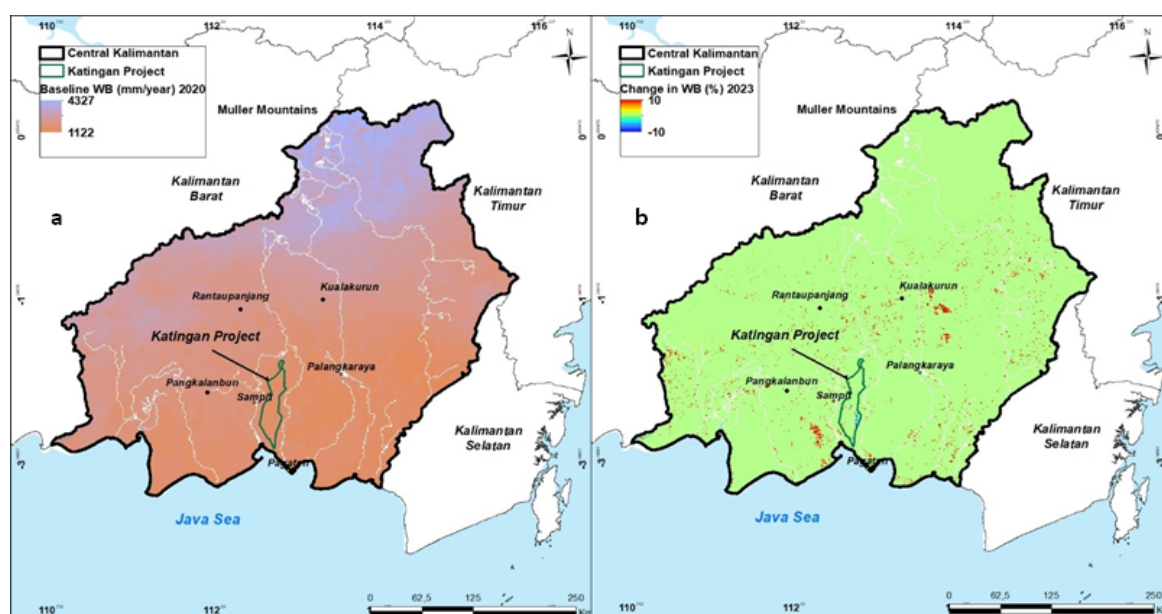


Figure 3.16. Water Balance across the Central Kalimantan district (a) and differences in percentage between 2020 and 2023 (b). Deforestation has affected the water balance more significantly south of the city of Sempit and east of the city of Kuala Kurun. The Katingan Mentaya Project appears located in an area where changes in surface water have been mostly neutral, which suggests positive climate adaptation outcomes for both downstream communities and biodiversity. Section 3.3.2b (Project Level Outcomes) provides a more detailed, high-resolution analysis of the climate adaptation benefits of the project.

- Runoff (m3/year)

Due to the neutral surface water balance effect and minimal downstream changes across the Central Kalimantan district, localised increases were primarily observed south of Sempit city and east of Kuala Kurun city (Figure 3.17b). The project area also displayed neutral changes in this aspect, which plays a key role in maintaining regular river flows that help reduce salinity intrusions to the Katingan lowland irrigation area especially in the dry season (Rahardjo, et al., 2024). As previously mentioned, localised increases in surface runoff result from reduced

evapotranspiration due to deforestation. However, this short-term effect is offset by reduced water availability in the middle to long term due to lower infiltration, limited groundwater recharge, disrupted rainfall patterns and salinity intrusions.

Figure 3.17a presents runoff across the Central Kalimantan district. Figure 3.17b reveals the differences in percentage between 2020 and 2023. Notably, changes in runoff during this period remain largely neutral within the Katingan Mentaya Project area.

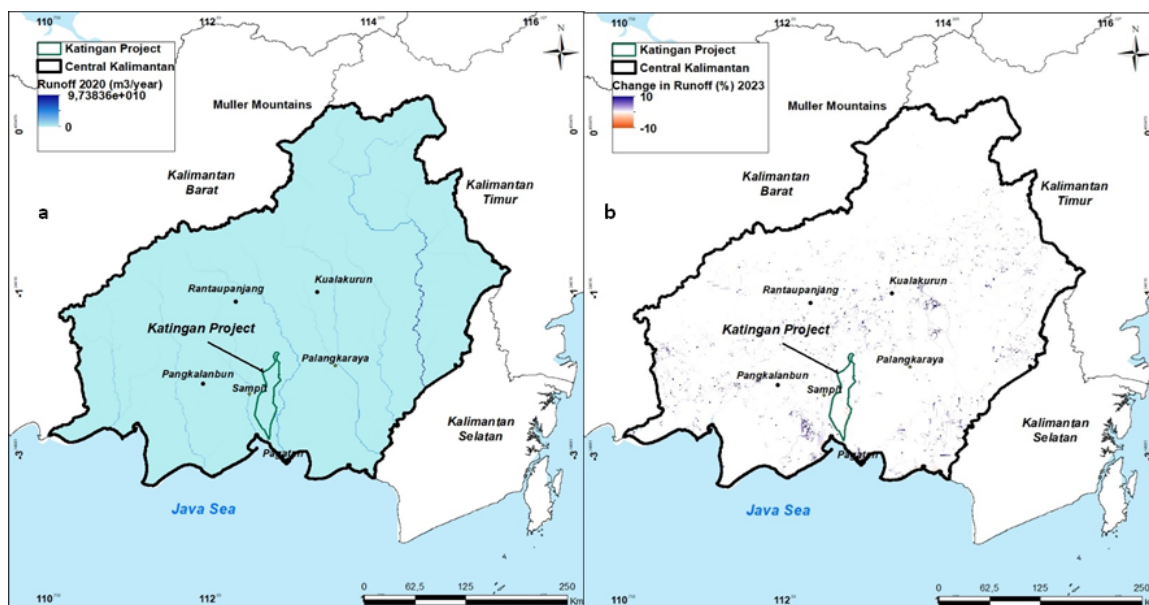


Figure 3.17. Runoff across the Central Kalimantan district (a), and differences in percentage between 2020 and 2023 (b). Notably changes in surface runoff during this period remain largely neutral within the Katingan Mentaya Project area, positioning it among the regions where surface runoff stays relatively stable across Indonesia. These findings suggest positive climate adaptation outcomes for both downstream communities and biodiversity. Section 3.3.2b (Project Level Outcomes) provides a more detailed, high-resolution analysis of these benefits.

- Water Stress (%)

The annual water stress indicator shows that the Central Kalimantan District does not currently experience annual water stress due to adequate water yield. However, maintaining healthy forest cover is vital for preventing potential water stress during the dry season of unusually dry years (Oettli, et al., 2018). Similarly, no water stress is observed within the project area, where forest conservation and recovery efforts contribute to a more stable hydrological regime. Ensuring low water stress levels is critical for better adaptation to the anticipated temperature increases resulting from climate change, as discussed in the validation report. This is particularly significant in reducing the vulnerability of irrigation districts downstream of the Katingan and Mentaya rivers, which are dedicated to rice production, as well as ensuring the stability and resilience of local ecosystems.

- Soil Erosion (mm/year)

The analysis conducted at the Central Kalimantan District scale, and compared to the Katingan Mentaya Project area, aimed to understand regional erosion dynamics and potential project benefits. In the Central Kalimantan district, mean annual soil erosion has remained relatively stable, with a slight increase of around 4% due to deforestation between 2020 and 2023. While localised increases in erosion have occurred in deforested areas throughout both steep and flat terrain (see Figure 3.18b), the average erosion rate across the district remains at around 3.4 mm per year or 38 tonnes per hectare. Significant variations in erosion rates exist, with higher rates observed in heavily deforested steep slopes and along rivers, while flatter terrains typically exhibit lower rates.

In contrast to the district-wide high soil erosion rates, the Katingan Mentaya Project shows very low erosion rates (i.e. a few dozen kilograms per hectare annually), and a slight reduction between 2020 and 2023, thanks to successful forest conservation and recovery efforts. However, since a 1km-scale study is too coarse to accurately assess changes in erosion at the project scale, especially considering the ongoing forest protection and recovery during the monitoring period, a further high-resolution analysis at a 1-ha scale will be conducted to validate these trends (see section b. Project Level Outcomes). Despite this, the stability in erosion within the project area, compared to higher and increasing rates elsewhere across the Central Kalimantan district, highlights the positive impacts of forest preservation by the project and potential benefits for downstream communities along the Katingan and Mentaya rivers and associated estuary ecosystems.

Figure 3.18 illustrates the distribution of soil erosion across the Central Kalimantan district, with Figure 3.18a using a logarithmic for better visibility. Figure 3.18b presents the change in soil erosion between 2020 and 2023, also using a log₁₀ representation to enhance visibility. It is worth noting that areas of higher soil loss coincide with regions of recent deforestation throughout but particularly south of the city of Sampit, east of the city of Kualakurun and at higher terrain.

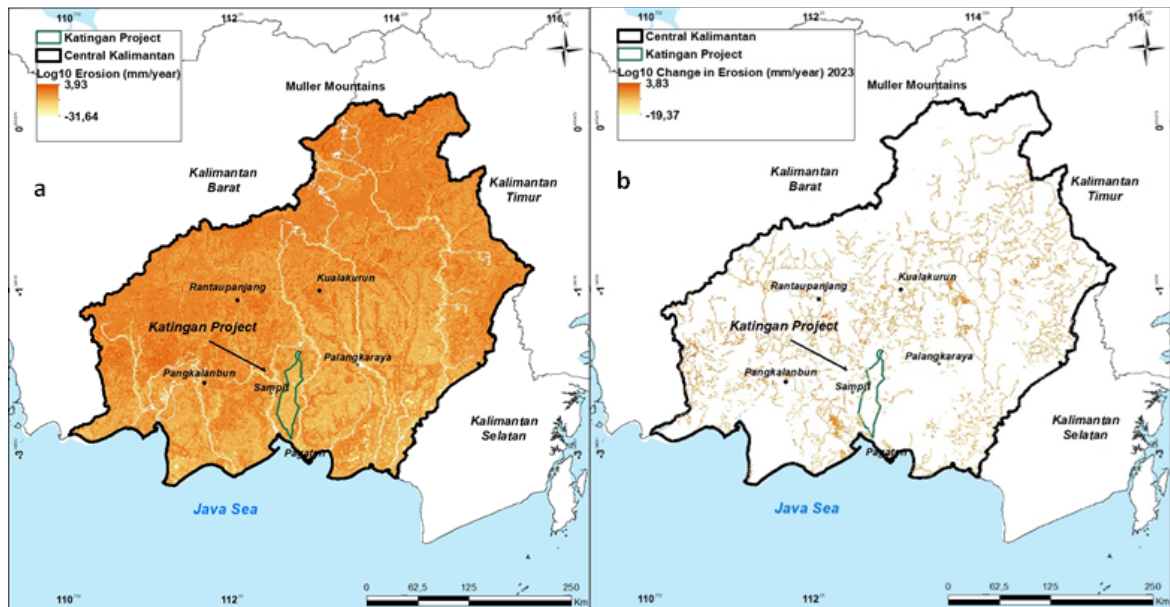


Figure 3.18. Distribution of soil erosion across the Central Kalimantan district, with Figure 3.16a using a logarithmic for better visibility. Figure 3.16b presents the change in soil erosion between 2020 and 2023, also using a log10 representation to enhance visibility. It is worth noting that areas of higher soil loss coincide with regions of recent deforestation throughout but particularly south of the city of Sampit, east of the city of Kualakuruk and at higher terrain. The Katingan project shows very low erosion rates during the monitoring period.

b. Project Level Outcomes

This section will present an in-depth analysis of the results for the Katingan Mentaya Project area scale. The findings will provide a more accurate basis for drawing conclusions about the project's benefits and identifying areas for improvement to maximise the climate adaptation benefits and overall resilience of the project.

- Forest Cover Scenarios

The scenario analysis assesses the effects of forest cover changes between 2020 and 2023 using data from the project's Monitoring plan (section 3.1.3). The results indicate that the Katingan Mentaya Project significantly contributed to forest recovery across more than 500 hectares. Both forest cover and biomass have increased in some areas (Figure 3.19e), although some small areas experienced some logging, as detailed in sections 3.1.3.3 and 3.2.2. In general, the project has enabled a more stable hydrology across the project area resulting in sound climate adaptation benefits for local communities and biodiversity, especially in freshwater ecosystems.

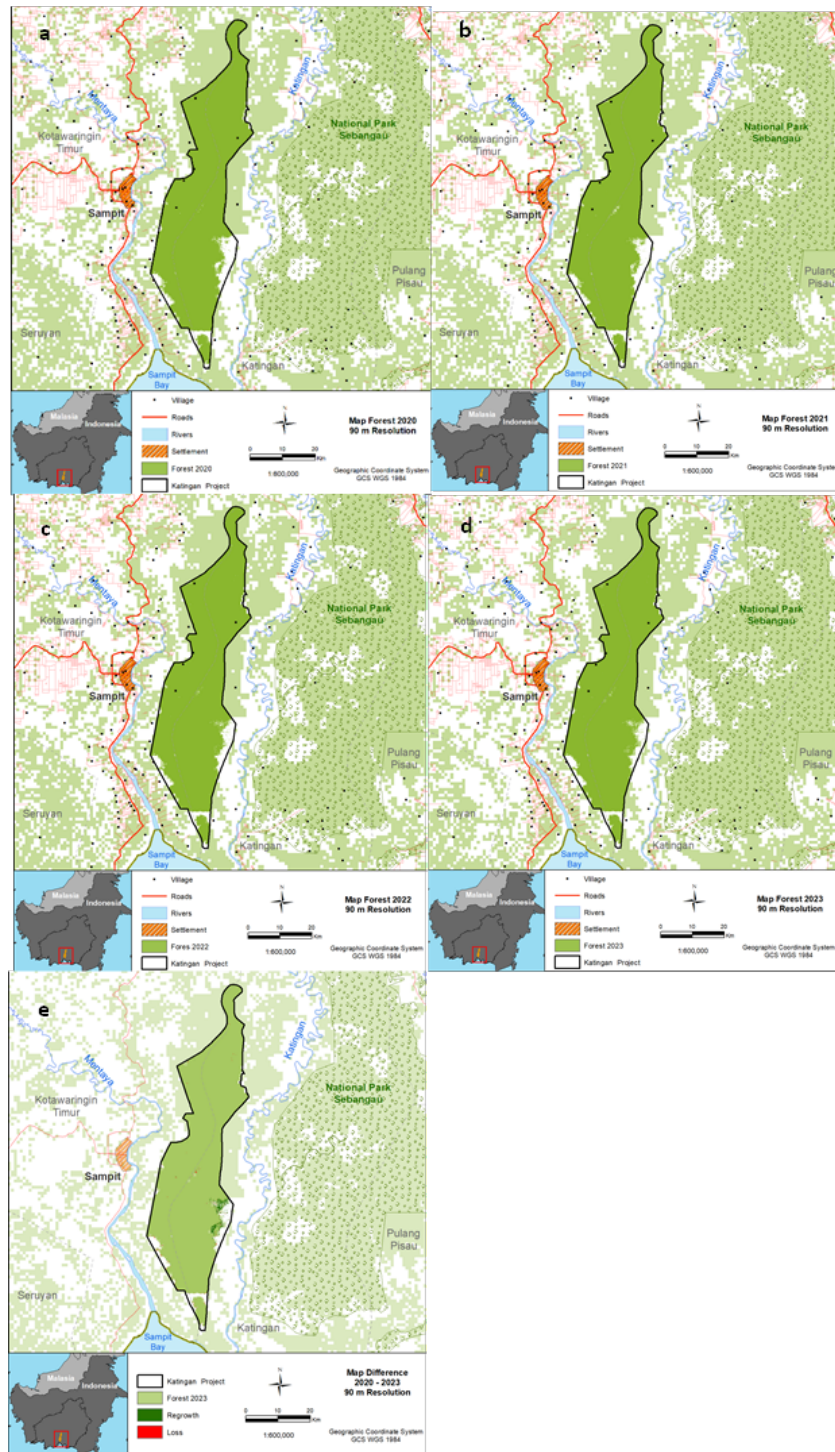


Figure 3.19. Forest cover in the Katingan Project area at 1-hectare scale. a. Forest Map 2020. b. Forest Map 2021. c. Forest Map 2022. d. Forest map 2023. e. Difference in forest cover between 2020 and 2023. Forest maps were used in the CostingNature model to implement the scenario analysis.

For example, increased forest cover contributes to better water regulation and enhanced water quality by reducing soil erosion and sedimentation. Avoiding soil erosion helps maintain soil nutrients, prevents rapid carbon release into the atmosphere, and reduces carbon losses in sediments transported downstream. Moreover, water regulation and reduced sedimentation prevents salinisation of agricultural soils by mitigating saltwater intrusion in downstream estuaries. The subsequent sections will explore these benefits and their implications for climate adaptation in the project area and further downstream. Figure 3.19 illustrates changes in forest cover between 2020 and 2023, highlighting areas where the Katingan Mentaya Project has successfully promoted forest recovery.

- Water Balance (mm/year)

By the end of the current monitoring report period, the surface water balance across the project area was found to be plentiful ranging from 1438 mm/year to 2595 mm/year, with an average of approximately 1567 mm/year (Figure 3.20a). Between 2020 and 2023 the 1-hectare analysis confirmed a neutral overall response with very minor localised increases or decreases in water balance across the project area from changes in AET (Figure 3.20b).

Between 2020 and 2023 the water yield across the project area has remained neutral. Though not modelled here, reductions in infiltration and soil water storage after minor logging events are likely to offset any short-term increase in water balance due to reduced AET, which in turn affects water regulation. Conversely, areas with increased forest cover tend to exhibit slightly higher AET and water storage capacity provided by the vegetation, which from the middle to longer term help to improve water regulation. The interplay between these factors, especially forest and peatland recovery, is ensuring that the project area returns to a more natural hydrological regime.

While the current model utilises global data for soils (Mulligan, 2024), incorporating more detailed local data would provide a more comprehensive understanding of the benefits of forest conservation and recovery within the project area, particularly regarding soil hydrology. On a regional scale, future evaluations should examine the impacts of deforestation and forest recovery on rainfall patterns as reported earlier for Borneo by McAlpine, et al., (2018). However, current models such as CostingNature are not yet capable of addressing these scenarios.

As the Katingan Mentaya Project progresses, continued monitoring and analysis of water availability will be essential to evaluate the effects of land cover changes on water resources especially in exceptionally dry years. This information will be crucial in developing effective water management strategies such as rainwater harvesting for human use, and to ensure ecological flows for biodiversity by working together with farmers in the project zone. Figure 3.20 shows the distribution of surface water balance across the project area. Figure 3.20a shows the surface water balance in 2020; and Figure 3.20b shows the change in surface water balance between 2020 and 2023.

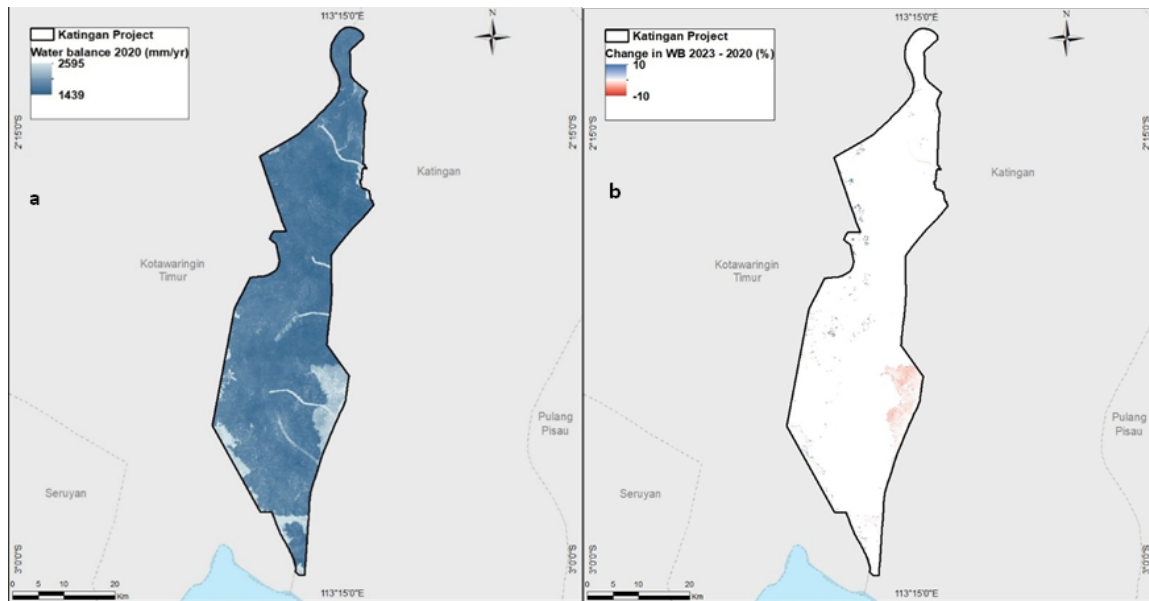


Figure 3.20. Distribution of surface water across the project area. Figure a depicts the surface water balance in 2020; and Figure b shows the change in surface water balance between 2020 and 2023.

- Runoff (m3/year)

The 2020-2023 analysis demonstrates that the Katingan Mentaya Project's conservation and recovery efforts have positively influenced runoff regulation. The surface runoff changes across the project area were largely neutral, with slight declines in runoff regulation in some areas due to logging, while regions experiencing forest recovery saw increases in natural flow regulation (Figure 3.21a, Figure 3.21b). The project has likely improved water infiltration rates and reduced flooding potential, contributing to a more resilient water supply and healthier ecosystems within the Katingan and Mentaya River Basins.

The project's efforts in understanding runoff dynamics and implementing effective forest conservation measures are crucial for supporting biodiversity, local communities, and sustainable development in Central Kalimantan. These measures improve regulation of streamflow to preserve ecological flows for diverse ecosystems, benefiting local flora and fauna, freshwater biodiversity, and economic activities like rice production (Fauzan, et al., 2021). Improved water flow regulation can also benefit navigation services downstream both Katingan and Mentaya rivers. Therefore, continued monitoring and analysis of surface runoff patterns will help assess the long-term impact of these interventions within the project area. This information will also inform future river management strategies in the project zone, where several irrigation districts for rice production are located as well as key river estuaries. Figure 3.21 shows the distribution of surface runoff across the project area. Figure 3.21a shows the surface runoff in 2020; and Figure 3.21b shows the change in surface runoff between 2020 and 2023.

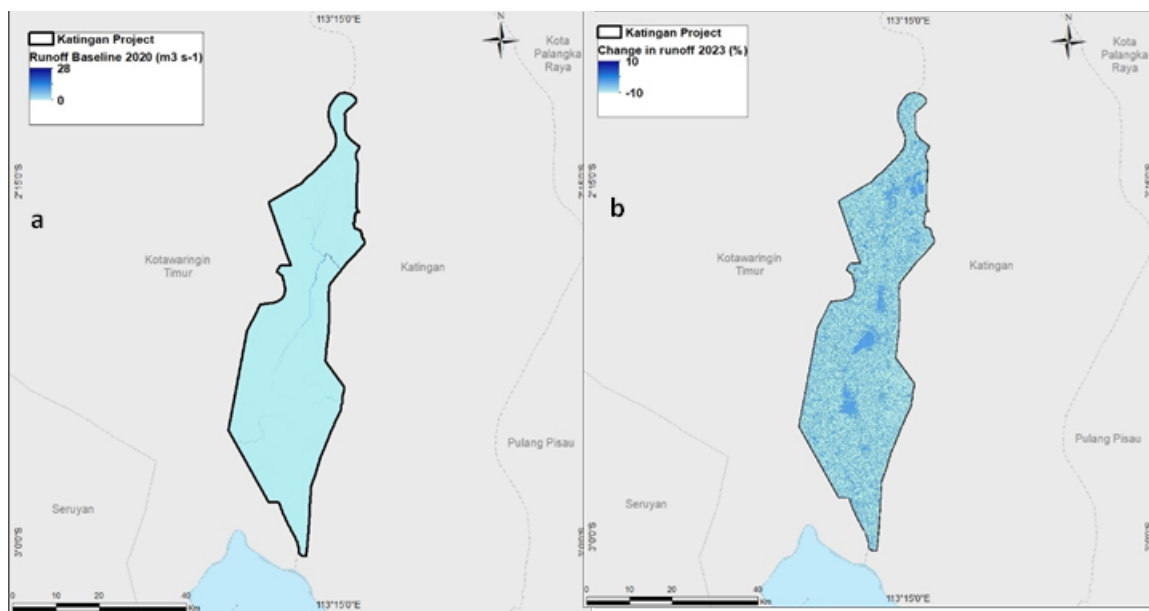


Figure 3.21. Distribution of surface runoff across the project area. Figure a illustrates the surface runoff in 2020; and Figure b depicts the change in surface runoff between 2020 and 2023. Changes in surface runoff are a function of forest recovery or logging. Changes are mostly neutral in the project area's average between 2020 and 2023.

- Soil erosion (mm/year)

The soil erosion analysis provided valuable insights into the dynamic nature of erosion in the project area, aligning with existing literature and supporting potential policy interventions. The findings showcased the positive impact of forest conservation and recovery efforts on mitigating soil erosion, emphasising the significance of continued monitoring and adaptive management strategies for the project area and downstream regions.

The modelling effort revealed an average soil erosion rate of 0.0147 mm per year, equating to roughly 180 kilograms per hectare annually, with neutral changes between 2020 and 2023. This value is consistent with findings reported in the literature for tropical forests in Borneo, and in central Kalimantan in particular, where soil erosion is limited by dense vegetation cover in flat terrain (Lefeuvre et al., 2022; Hartanto, et al., 2003). This positive impact is likely to benefit the aquatic biodiversity of the Mentaya and Katingan Rivers and the local communities inhabiting its surroundings. Also, avoided increases in erosion have safely led to further reductions in CO₂ emissions from soils within the project area, as soil erosion is responsible for the loss of soil carbon (Huon, et al., 2013).

In addition, the analysis helped to identify key areas to focus additional forest regeneration efforts especially where illegal logging and fires had occurred prior to this monitoring report period (Figure 3.22b). These estimates underscore the value of high-resolution analyses and highlight the positive outcomes of forest conservation and regrowth efforts in reducing erosion. Figure 3.22 illustrates the distribution of soil erosion across the Katingan Mentaya Project project

area, with Figure 3.22a using a logarithmic scale for better visibility. Figure 3.22b presents the change in soil erosion between 2020 and 2023, also using a log₁₀ representation to enhance visibility. It is worth noting that increased erosion has been identified in a few minor areas where illegal logging needs to be better controlled. Also, the project's recovery of forests previously affected by fires has resulted in important erosion reductions along the Katingan river.

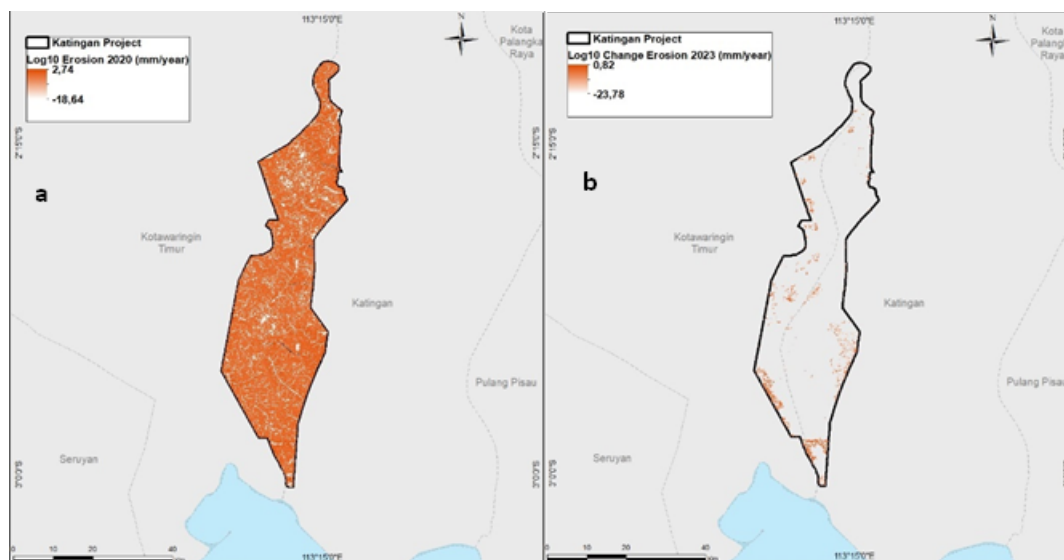


Figure 3.22. Distribution of soil erosion across the Katingan Mentaya Project project area. Figure a shows the baseline soil erosion (2020) using a logarithmic scale for better visibility. Figure b presents the change in soil erosion between 2020 and 2023, also using a log₁₀ representation to enhance visibility.

- Human Footprint on Water Quality (HFWQ) Index

The baseline analysis identified minor water pollution issues in the project area, amounting to only around 5% of surface runoff. Issues are particularly more accentuated near the city of Kasongan, north of the project area (Figure 3.23a). The area has been reported recently to exhibit waste pollution, particularly bacterial contamination (Rahman et al., 2024). Minor pollution levels are also observed east of the project area around rice crops near the towns of Telaga and Glinggang (Figure 3.23a). West of the project area pollution levels are similarly observed near rice crops in proximity to the Kualasampit town and Setiroek to the south.

Forest conservation and recovery efforts from 2020 to 2023 have successfully maintained low levels of contamination and have helped reduce it in some of the areas highlighted above (Figure 3.23b). This positive result is ensuring better water quality for aquatic ecosystems and local communities. However, additional efforts are needed to educate local communities within the project zone to further mitigate water pollution from agricultural activities and wastewater at the project border.

Modelling results demonstrate that conservation measures and better land management practices can help reduce water quality issues in the project area and its surroundings.

Nevertheless, continued engagement with local communities in the project zone and promoting sustainable practices in the agricultural sector will continue to be important in addressing water contamination issues, which can be potentially exacerbated by climate change. Figure 3.23 shows the distribution of the HFWQ index across the project area. Figure 3.23a show the distribution of the HFWQ index in 2021; and Figure 3.23b shows the change in the HFWQ index between 2020 and 2023.

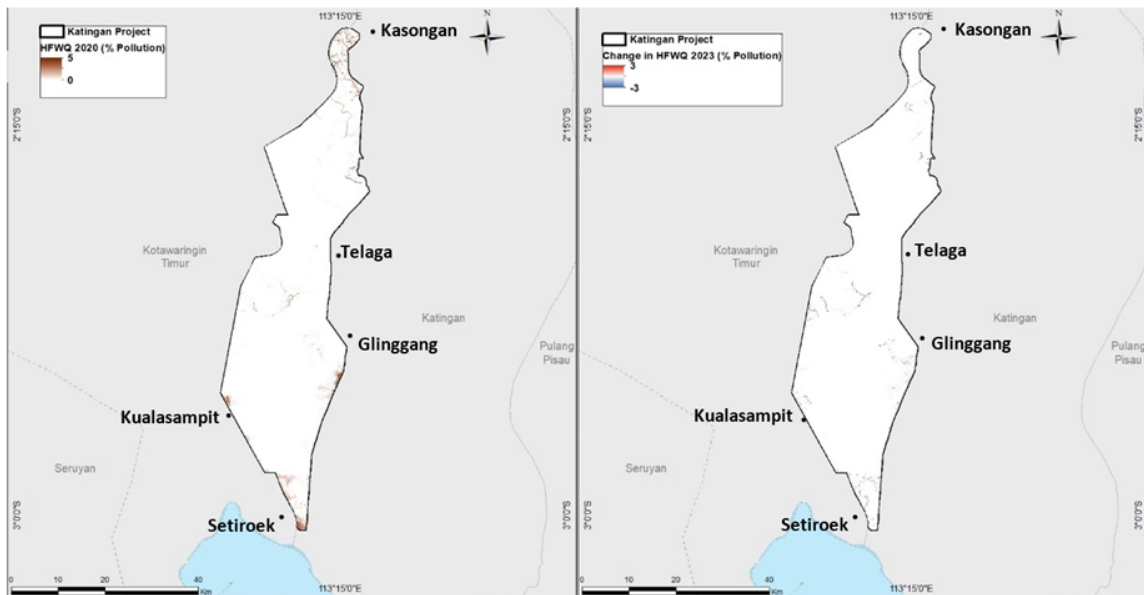


Figure 3.23 Distribution of the HFWQ index across the project area. Figure a shows the distribution of the HFWQ index in 2021; and Figure b shows the change in the HFWQ index between 2020 and 2023. Pollution declines can be observed north, east and south of the project area.

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4 COMMUNITY

4.1 Net Positive Community Impacts

4.1.1 Community Impacts (CCB, CM2.1)

The wider project zone outside of the project area encompasses 34 village communities with an estimated population of 47,268 people living in 12,364 households. These villages fall under the territorial administration of Mendawai, Kamipang, and Bengkurung sub-districts of Katingan District, and Seranau and Pulau Hanaut sub-districts of Kotawaringin Timur District. These communities typically make their living from the land and from the rivers, predominantly relying on small-scale agriculture and traditional fisheries. Rice, rubber, coconut, rattan, fruits, non-timber forest products, and freshwater fish are among the most common livelihood commodities in the project zone. During this monitoring period, many project activities were conducted with the communities in the project zone which had a net positive impact on all community groups. Additional details on the activities are detailed in the monitoring summary later in this section and in the Community MRV in Appendix 4.

Affected groups participated in the evaluation of impacts through a participatory process that included village meetings, focus group discussions, school-level consultations, customary forums, GRM inputs, and ongoing engagement with communities and local institutions during implementation. This is further specified in the table below:

Community group	Women
Impact	Increased participation in project consultations; training; economic opportunities
Type of benefit/cost/risk	Impacts listed are actual, direct benefits
Change in well-being	The well-being of women in the project zone communities has improved due to enhanced participation in project consultations and increased access to training and economic opportunities. The initiatives to hold women-only meetings and alternate comments between genders have empowered women to actively engage in consultations, leading to a significant rise in their contributions and feedback. This change not only ensures their voices are heard

	but also fosters an inclusive environment where women feel valued and confident to share their perspectives. Additionally, increasing training opportunities designed specifically for women has made a significant impact. These sessions have helped equip them with vital skills and knowledge, paving the way for their personal and professional growth. The participation of women in these training programmes has soared, reflecting their eagerness to learn and contribute more effectively to the project's community's development. Furthermore, the increase in economic opportunities for women, especially in leadership roles within microfinance and other economic activities, has been a catalyst for empowerment. This shift has not only provided them with financial independence but also positioned them as key decision-makers and influencers in the community. Their enhanced economic participation has brought about a sense of self-reliance and confidence, contributing significantly to their overall well-being. Women were monitored through women-led discussions, village meetings, training and participation logs, post-training evaluations, and records of participation in consultations and income-generating activities. Monitoring also included gender-disaggregated analysis of participation in training, governance, livelihood activities, income generation, and access to community benefits. The methodological approach consisted of gender-responsive monitoring using women-led discussions, village meetings, consultation and training records, post-training evaluations, and participation logs. Data were disaggregated by gender to assess women's participation in consultations, training, governance, livelihood activities, income generation, and access to project benefits. This approach helped verify whether project activities contributed to improved skills, confidence, economic opportunities, leadership roles, and overall well-being for women.
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Community group	Youth (recent graduates at risk of unemployment or relocation)
Impact	Job training and economic opportunity
Type of benefit/cost/risk	Impact is an actual, direct benefit.

Change in well-being	The well-being of recent graduates has significantly improved due to the project's targeted efforts. By identifying and creating job opportunities within the community, the project has been instrumental in preventing the potential exodus of skilled youth. Providing job training ensures that these young adults are employment-ready and equipped with the skills needed to excel in their chosen fields. Furthermore, the sponsorship of youth internship opportunities offers practical experience, enhancing their resumes and making them more attractive to future employers. This comprehensive approach not only aids in their professional development but also fosters a sense of belonging and contribution within their community, enhancing overall life satisfaction and stability. Youth were monitored through youth-specific discussions, training and attendance records, internship and participation records, post-training surveys, and monitoring of participation in project activities and leadership roles. Data were reviewed by age group, particularly youth aged 15–24, and included tracking of education, training participation, skill application, and livelihood opportunities. The methodological approach consisted of youth-focused monitoring through discussions, training and attendance records, internship and participation records, and post-training surveys. Data were reviewed by age group, particularly youth aged 15–24, to assess training participation, skill development, application of skills, livelihood opportunities, and involvement in project activities or leadership roles. This helped verify whether the project improved employability, local job opportunities, and overall well-being for recent graduates.
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Village institutions (LPHD, BPD)	Village institutions (LPHD, BPD)
Impact	Stronger participation in planning, governance, validation, and benefit distribution processes
Type of benefit/cost/risk	Impact is an actual, direct benefit.

Change in well-being	The well-being of village institutions has improved through stronger participation in planning, governance, validation, and benefit distribution processes. This has enhanced institutional capacity, improved coordination and accountability, and strengthened their role in representing community interests. As a result, local governance has become more effective and trusted, contributing to better decision-making and more transparent project implementation. Village institutions were monitored through meeting logs, institutional assessments, legal support records, records of FPIC and social forestry processes, participation records from planning and validation meetings, MoUs, village workplans, grievance records, and documentation of benefit distribution processes. Monitoring considered institution type and participation rates. The methodological approach consisted of institution-focused monitoring through meeting logs, institutional assessments, FPIC and social forestry records, MoUs, village workplans, grievance records, and documentation of planning, validation, and benefit distribution processes. Data were reviewed by institution type and participation rates to assess institutional capacity, coordination, accountability, representation, and transparency in project governance and decision-making.
Community group	Wider community members (customary leaders, religious leaders, youth groups)
Impact	Increased opportunity to participate, provide feedback, and raise concerns through consultations and the GRM
Type of benefit/cost/risk	Impact is an actual, direct benefit.
Change in well-being	The well-being of wider community members has improved through increased opportunities to participate in consultations, provide feedback, and raise concerns through the grievance redress mechanism. This has strengthened inclusion in project processes, improved confidence that community views are heard, and supported more transparent and responsive engagement between the project and stakeholders. As a result, communities

	experience stronger participation, greater trust, and a clearer sense of involvement in decisions affecting them. Wider community members were monitored through village consultations, focus group discussions, community feedback evaluations, grievance redress mechanism records, meeting logs, participatory mapping, community reports, and stakeholder consultation records. These methods captured participation, feedback, concerns raised, responses provided, and perceived changes in transparency and inclusion. The methodological approach consisted of monitoring consultations, focus group discussions, GRM records, meeting logs, participatory mapping, community reports, and stakeholder feedback records. These data were reviewed to assess participation, feedback, concerns raised, project responses, and perceived improvements in transparency, inclusion, trust, and community engagement.
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Community group	Livelihood groups (agroforestry farmers, livelihood beneficiaries)
Impact	Improved production, income diversification, and adoption of sustainable livelihood practices
Type of benefit/cost/risk	Impact is an actual, direct benefit.
Change in well-being	The well-being of livelihood groups has improved through stronger production practices, greater income diversification, and the adoption of more sustainable livelihood strategies. These changes help reduce vulnerability to economic shocks, strengthen household income security, and improve the long-term sustainability of natural resource use. As a result, beneficiaries are better positioned to maintain stable livelihoods while reducing pressure on forest resources. Livelihood groups were monitored through training and participation logs, post-training surveys, focus group discussions, farmer school records, demonstration plot monitoring, and records of participation in agroforestry, NTFP, aquaculture, and other

	livelihood activities. Monitoring included disaggregation by household, gender, youth, village, and vulnerability where relevant. The methodological approach consisted of monitoring training and participation logs, post-training surveys, focus group discussions, farmer school records, demonstration plot data, and livelihood activity records. Data were reviewed by household, gender, youth, village, and vulnerability where relevant to assess production improvements, income diversification, adoption of sustainable practices, income security, and reduced pressure on forest resources.
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4.1.2 Negative Community Impact Mitigation (VCS, 3.19; CCB, CM2.2)

In our commitment to sustainable community engagement and adherence to the precautionary principle, we have implemented various activities and processes to mitigate potential negative impacts on community well-being and to maintain or enhance high conservation value (HCV) attributes.

Participatory Planning Process

A key component of our approach is the participatory planning process, which ensures that project designs are beneficial and sustainable in the long term. We actively engage with community groups through thorough consultations, where potential negative impacts—such as pollutants (air, noise, discharges to water, waste generation, release of hazardous materials)—and the safety of vulnerable groups like women, girls, children, and marginalised communities are proactively identified and discussed. This participatory approach allows us to understand and consider the unique needs and concerns of these groups, ensuring that their well-being is central to our planning (Anderson et al., 2016; Venter & Sutherland, 2020).

Precautionary Principle

Consistent with the precautionary principle, we consider all potential adverse effects during the planning stages, including those not yet fully substantiated by scientific evidence. This approach means that we don't wait for conclusive evidence of harm before taking action to prevent negative impacts. By anticipating potential issues and implementing strategies to preemptively address them, we aim to avoid or minimise harm to the community and the environment (Raffensperger & Tickner, 1999).

Monitoring and Continuous Engagement

To date, monitoring data and insights gathered from our project team's interactions with the community reveal no evidence of adverse effects on any specific sub-groups or HCV attributes as a result of the project. This indicates that our proactive and precautionary measures have been effective so far. However, we remain vigilant. Building on the strategies outlined in Section 2 of our report, we will continue to actively engage with communities, ensuring that their feedback is integral to our ongoing efforts. This continuous engagement is crucial as it allows for the early detection of potential issues and the swift implementation of mitigation strategies if unforeseen adverse effects arise (International Union for Conservation of Nature [IUCN], 2011).

4.1.3 Net Positive Community Well-Being (VCS 3.19; CCB, CM2.3, GL1.4)

The project's net positive impact on community well-being, compared with the without-project land use scenario, is significant and diverse, benefiting all groups within the project zone. As detailed in Section 4.3.1, the project has not only positively impacted the communities but has also safeguarded high conservation values related to community well-being. This comprehensive approach has notably improved the quality of life for women, youth, individuals from at-risk occupations, and vulnerable groups like the elderly and children (UNDP, 2020; FAO, 2021).

In terms of climate change adaptation, which is a critical aspect for projects validated at the Gold Level, our project has made significant strides. The initiatives undertaken have been instrumental in strengthening community and biodiversity resilience against the probable impacts of climate change. This includes the restoration of peat swamp ecosystems and reforestation, which are crucial for carbon sequestration and maintaining ecological balance (Parish et al., 2008; IPCC, 2019). The development of climate-resilient infrastructure and sustainable agricultural practices further fortifies the community's ability to withstand climatic changes (Kassam et al., 2020). The integration of natural disaster prevention and management systems, along with capacity building in forest management and the development of non-timber forest products, demonstrates a deep commitment to environmental stewardship and community resilience. These efforts mitigate climate change impacts and ensure sustainable use of natural resources, benefiting the community and the environment (Mukul et al., 2016).

A key component of our climate change adaptation strategy is the active involvement of communities. For instance, the Agroecological Farmer School has been pivotal in mainstreaming sustainable agricultural practices. This initiative has garnered significant interest and participation from local farmers, reflecting a community-driven approach to climate change

adaptation. It educates and integrates farmers into the broader community's efforts, ensuring that adaptation strategies are locally relevant and sustainable (Gliessman, 2015).

Furthermore, the project's initiative in 2019, led by PT. RMU, to ensure clean water availability during dry seasons highlights a proactive approach in addressing essential community needs amidst changing climate conditions. This initiative is particularly crucial as water scarcity can become a pressing challenge in the context of climate change (UN Water, 2020).

Overall, these efforts demonstrate the project's success in not only enhancing community well-being but also equipping communities to adapt and thrive in the face of climate change challenges. The project goes beyond mere mitigation, actively contributing to the development of a resilient community that is better prepared for the uncertainties and challenges posed by a changing climate (World Bank, 2021).

4.1.4 Protection of High Conservation Values (CCB, CM2.4)

The Katingan Mentaya Project has ensured that all High Conservation Values (HCVs) identified in the project description are protected, maintained, or enhanced through its activities. Below is a demonstration of how the project safeguards these HCVs and ensures there are no negative impacts:

HCV 4: Critical Ecosystem Services

Hydrological Function and Fire Prevention: The project actively restores degraded peat swamp forests, which improves water flow stability, reduces fire risks, and prevents peat subsidence. These actions mitigate potential negative effects, such as flooding or water scarcity, that could harm the local community.

Erosion and Soil Nutrient Maintenance: By stabilising soils and reducing erosion, the project enhances agricultural productivity for nearby communities. There is no evidence of detrimental impacts on these services, as baseline assessments without the project show degradation would have worsened without intervention.

Saltwater Intrusion Prevention: Restoration efforts mitigate saltwater intrusion into freshwater systems, ensuring the availability of clean water for irrigation and drinking. The project's focus on maintaining these services confirms its alignment with local needs and well-being.

HCV 5: Basic Needs of Local Communities

Non-Timber Forest Products (NTFPs): The protection and restoration of natural forests ensure sustained access to essential resources such as rattan and medicinal plants. By promoting sustainable harvesting and market access for these products, the project avoids overexploitation, enhancing community livelihoods rather than harming them.

Sustainable Livelihoods: Through its conservation activities, the project generates alternative income sources and supports local businesses. The integration of sustainable practices ensures the ongoing availability of natural resources for local communities, countering any potential adverse effects.

HCV 6: Traditional Identity of Communities

Culturally Significant Sites: The project involves local communities in identifying and safeguarding areas of cultural importance. Formal protection and community-driven management eliminate risks of cultural site degradation or displacement.

4.2 Other Stakeholder Impacts

4.2.1 Mitigation of Negative Impacts on Other Stakeholders (VCS, 3.18, 3.19; CCB, CM3.2)

Given the careful planning and design phase of the project, it is anticipated that there will be no negative impacts on the well-being of offsite stakeholders. This outcome is the result of a thorough and proactive approach taken during the project's design phase, where potential offsite groups were identified and evaluated for any possible impact (Nelson & Stathers, 2009; World Bank, 2014).

The process of identifying these groups involved a comprehensive assessment to understand the project's broader social and environmental context. This assessment aimed to ensure that no group, even those not directly involved in the project zone, would be adversely affected by the project's activities (Freeman et al., 2020). A systematic analysis was conducted to map and engage all potentially affected stakeholders, which is considered a best practice in social impact assessment (Vanclay, 2003).

After this careful evaluation, it was concluded that none of the identified offsite groups are likely to be impacted by the project. This conclusion stems from the fact that the project zone was meticulously designed to incorporate all those groups who were likely to be affected. By doing so, the project has effectively contained its activities and impacts within the designated area, mitigating the possibility of unintended consequences on other stakeholders (Glasson et al., 2012).

Moreover, the project's commitment to no offsite stakeholder impacts is underpinned by ongoing monitoring and evaluation. This involves continuously assessing the project's influence beyond its immediate boundaries to ensure that the initial assessment remains valid throughout the project

lifecycle. Ongoing monitoring is critical for identifying any unforeseen impacts and ensuring the project's adaptive capacity to respond effectively (International Association for Impact Assessment [IAIA], 2015). Should any unforeseen impacts on offsite stakeholders arise, the project is prepared to take appropriate measures to mitigate these impacts (IFC, 2012).

4.2.2 Net Impacts on Other Stakeholders (VCS, 3.18, 3.19; CCB, CM3.3)

The project area contains no permanent human settlements and was explicitly delineated to exclude occupied lands, avoiding displacement or access restrictions. Engagement with stakeholders in the surrounding project zone (34 villages; ~47,268 people) followed FPIC-based consultations, regular village meetings, and an accessible grievance mechanism. Throughout 2020–2023, we monitored well-being via SIRETA (household surveys, FGDs, service statistics, and program logs) with attention to women, youth, vulnerable groups, and resource access. No grievances alleging harm were upheld, and monitoring found no verified adverse effects attributable to project activities.

Instead, evidence indicates net positive outcomes: women's participation and income opportunities increased (including leadership in microfinance); youth accessed training, internships, and local jobs; children benefited from early-education support and safer classrooms; at-risk workers (e.g., informal loggers/miners) transitioned to legal, sustainable livelihoods; and vulnerable groups gained improved health services (Posyandu, Boat Clinic, WASH). Fire prevention, social forestry, and climate-smart agriculture further reduced risk to community well-being. Based on this evidence, project activities have not resulted in net negative impacts on the well-being of other stakeholders.

4.3 Community Impact Monitoring

4.3.1 Community Monitoring Plan (CCB, CM4.1, CM4.2, GL1.4, GL2.2, GL2.3, GL2.5)

During the current monitoring period, from January 2020 to December 2023, we monitored community impacts across the 34 villages in the wider project zone using a combination of routine project monitoring, participatory field processes, and targeted evaluation activities. The principal sources used for this section were SIRETA, Community MRV records, implementation and participation logs, grievance records, sectoral documentation, and findings from the 2023 RMU Impact Evaluation. The 2023 evaluation complemented routine monitoring by applying a mixed-methods approach over a four-month field period across 35 RMU-supported villages, including document review, focus group discussions, direct observation, and a survey of 1,122 respondents using proportionate stratified random sampling. FGDs were conducted in five clusters and included village government and

community leaders, women and other vulnerable groups, and beneficiaries of RMU community development activities.

Community Well-being

We monitored this theme through household-level and project-level information on livelihoods, employment, access to basic services, and perceptions of change in well-being. Routine records and SDG-linked tracking show that the project contributed to poverty reduction through formal jobs and social protection, with an average of 176 employees per year and 391 community members benefiting from paid work; staff also received health and pension coverage, while long-term casual workers were covered by accident insurance. Monitoring also recorded improved access to basic services, with 3,987 people reached through livelihood interventions, 640 through education and culture support, 2,417 through health activities, and 268 through WASH-related improvements. Secure tenure and governance-related well-being were also monitored through social forestry documentation, showing 11 communities with 35-year legal rights over 35,855 ha. In addition to routine records, affected communities evaluated these changes through meetings, FGDs, field engagement, and grievance channels, which provided qualitative feedback on employment, livelihoods, service access, and local priorities.

Education and Capacity Building

We monitored this theme through training logs, education programme records, school-level support documentation, and the 2023 impact evaluation. During the current monitoring period, education-related project activities were implemented throughout January 2020 to December 2023, including support to five preschools in five villages, two river boat schools, and two agricultural vocational schools. Monitoring records also show 241 adults enrolled in Kejar Paket, of whom 40 were certified, with 78% women. Capacity-building records further show 2,364 participants in community trainings across 143 events, and 2,544 participants in technical and SDG-related trainings. These results indicate that education and capacity-building indicators were monitored during the reporting period through implementation records, SIRETA, attendance records, and direct engagement with schools and beneficiaries.

Health and Sanitation

We monitored this theme through health activity records, WASH implementation records, direct field observation, village- and facility-level documentation, and information consolidated in SIRETA. Health and WASH activities were implemented during January 2020 to December 2023, including support to 55 Posyandu in 34 villages, the operation of a boat clinic, health cadre training, and hygiene and sanitation interventions. Monitoring recorded approximately 2,599 patients served through the boat

clinic, ISPA/ARI education reaching around 1,580 participants, SRHR education reaching more than 1,300 women and youth, and TB support for around 150 cases during 2022–2023. WASH monitoring recorded 20 drilled wells, 189 river latrines removed, and 22 handwashing stations installed in schools and Posyandu, with sustained WASH access reported in 12 villages. These indicators were monitored through project records, health-sector references, and routine field verification.

Livelihoods and Income

We monitored this theme through implementation records, SIRETA, participation and attendance records, field verification, FGDs, and selected financial and programme records. Agroforestry and sustainable agriculture activities were implemented during January 2020 to December 2023, including a 5 ha agroforestry demonstration plot in Kampung Melayu, 15 ha of peatland agroforestry in Serambut, semi-intensive agroforestry with fruit crops involving 830 farmers across Seranau, Pulau Hanaut, and Mendawai during 2021–2023, and horticulture intensive management involving 48 farmers during 2021–2022. SDG-linked monitoring also recorded 909 farmers trained or registered, 891 ha under no-burn or organic practices, 122 ha of demonstration plots, and 401 people involved in climate-smart agriculture and productivity activities. Additional livelihood monitoring showed support to 14 former illegal loggers during 2022–2023 in the Pulau Hanaut Zone, the continuation of KSM Mendawai Sejahtera with 10 women’s groups and 83 active members, and support to BumDes Sehati Serambut since 2022 for coconut oil and VCO production, creating opportunities for women and youth. Together, these results show that livelihoods and income indicators were monitored throughout the period through both quantitative records and qualitative validation from field engagement.

Community Resilience

We monitored community resilience through records and field evidence related to fire prevention, restoration, rewetting, adaptive livelihood support, and community perceptions of socio-ecological risks. During January 2020 to December 2023, fire prevention and resilience-related activities included engagement in 33 villages with 2,028 people involved, training of 1,380 community members in fire prevention, and zero large-scale fire incidents recorded across 149,800 ha. Rewetting monitoring recorded the construction of 34 canal blocks across key areas including Hantipan, Perigi, and southern zones. Restoration-related monitoring also documented 1,661 ha of degraded land restored through planting since 2016, 55,363 ha undergoing natural succession, and 671,523 seedlings planted. In the 2023 impact evaluation, FGD participants reported that fire patrol, replanting, environmental education, and no-burn farming support contributed to reduced fire risks and improved environmental conditions, although they also noted constraints such as flooding, pests, and the difficulty of sustaining zero-burn agriculture without continued support. These findings indicate

that resilience was monitored through both activity-based records and community evaluation of outcomes.

Women's Participation

We monitored women's participation through sex-disaggregated training and livelihood records, women-focused programme documentation, women-led FGDs in the 2023 impact evaluation, and participation records from meetings and institutions. The current monitoring period recorded 11 women's groups with 83 active members participating in microfinance and enterprise activities, including VCO, snacks, and biodegradable fiber bags. Women and girls were also reached through education and health interventions, including SRHR education for 631 women and 732 students. Meeting and training records further show strong female participation, including 208 community meetings with 14,313 participants, 77% women, as well as broader governance records indicating 904 community meetings with 28,516 participants, the majority women. The 2023 impact evaluation further found that women were actively involved in planning and implementation of economic, health, and educational initiatives, although it also identified continuing gaps in meaningful attention to gender-specific priorities.

Youth Engagement

We monitored youth engagement through attendance records, education and enterprise activities, meeting participation, and qualitative feedback from field engagement and the 2023 impact evaluation. Available routine records show that youth were engaged through education and skills-related activities, through broader participation in community meetings, and through specific enterprises such as BumDes Sehati Serambut, which since 2022 has created opportunities for women and youth in coconut oil and VCO production. However, unlike some other themes, youth engagement was not consistently reported as a separate quantitative series across all project records during the full monitoring period. Accordingly, the results for this theme are supported by a combination of implementation records and qualitative evidence rather than a complete stand-alone dataset for all years.

HCVs Related to Community Well-being

We monitored HCV-related community indicators through fire monitoring, social forestry records, biodiversity monitoring, field reports, community engagement processes, and selected components of the 2023 impact evaluation. Monitoring covered access to non-timber forest products, cultural and livelihood-related values, village forests managed under social forestry, and community participation in fire prevention and environmental protection. Biodiversity monitoring during January 2020 to December 2023 included 247 camera units, 70,449 total trap days, 570 sampling stations, 48

orangutan transects covering 248 km with 2,396 nests detected, 36 general fauna transects covering 200 km with 135 species and 3,254 individual observations, plus 146 ad hoc species detections. Social forestry records also showed support to 8 LPHDs, including facilitation of 5 new forest management decrees in 2023. These results show that HCV-related monitoring was undertaken during the reporting period and linked both ecological and community well-being dimensions.

Governance and Institutions

We monitored governance and institutions through meeting logs, MoU and PKK processes, grievance records, records of support to local institutions, and qualitative feedback from communities and local leaders. During January 2020 to December 2023, the project maintained 80 MoUs with 34 villages and 5 sub-districts and supported participatory processes through community meetings and local institutions such as LPHDs, women's groups, KSMs, Posyandu, BUMDes, STA, and customary institutions. SDG and governance records show 34 villages with MoUs, FPIC and GRM operating, and public transparency and external audit processes in place. In the 2023 impact evaluation and routine field engagement, communities also provided feedback through village meetings, FGDs, and grievance channels, including requests for continued microfinance mentoring, inclusion in fire team rotations, and stronger grievance transparency.

Overall, we confirm that the themes and indicators presented in the updated PD were monitored during the current monitoring period, although not all were monitored with the same frequency or through the same tool. Some indicators were monitored primarily through routine implementation records and annual consolidation in SIRETA, while others were assessed through direct field observation, FGDs, meetings, grievance records, and the 2023 mixed-methods impact evaluation. Section 4.3.1 is therefore presented by key theme and key indicator, with results reported using the best available evidence collected during the reporting period.

4.3.2 Monitoring Plan Dissemination (CCB, CM4.3)

The process of disseminating and making monitoring results publicly available, as described in the context of a project adhering to standards such as the Climate, Community & Biodiversity (CCB) Standards and the Verified Carbon Standard (VCS), involves several key steps aimed at ensuring transparency, accessibility, and engagement with communities and stakeholders. Here's a breakdown of these steps:

Online Posting and Databases

CCB Public Comment Period: Initially, the Project's Monitoring Report is made available online during the CCB public comment period. This phase is crucial for transparency and stakeholder

engagement, as it allows the public and interested parties to review, comment, and provide feedback on the monitoring results before they are finalised.

VCS Database: Following the verification process, the finalised Monitoring Report is uploaded to the VCS Database. This ensures that verified and approved results are accessible for review by any interested parties globally, enhancing the project's credibility and the reliability of its reported outcomes.

Local Language Summaries

Community Communication: Summaries of the Monitoring Report are prepared in the local language(s) of the project's surrounding communities. These summaries are distributed to all community members each time a new report is generated, ensuring that the information is accessible to non-English speakers and that local stakeholders are kept informed about the project's performance and impacts.

Local Meetings: Project team members take an active role in community engagement by presenting the monitoring results in local meetings. This direct interaction allows for a more in-depth discussion of the results, provides an opportunity for community members to ask questions, and facilitates a two-way dialogue between the project team and the community.

Accessibility of Full Reports

Electronic and Hard Copies: Full copies of the Monitoring Report are made available in English to all stakeholders, either electronically or in hard copy upon request. This ensures that detailed information is accessible to those who wish to delve deeper into the monitoring data and analyses, including researchers, policymakers, and other interested stakeholders.

Engagement and Feedback Mechanism

Q&A Sessions: During the presentations in local meetings, time is allocated for answering questions from the community and stakeholders. This interactive component is vital for clarifying any uncertainties, addressing concerns, and gathering feedback, which can be instrumental in improving future monitoring efforts and project outcomes.

These steps underscore the project's commitment to transparency, stakeholder engagement, and the dissemination of information in an accessible and understandable way. By employing a mix of online platforms, local language resources, and direct community engagement, the project

ensures that monitoring results are not only publicly available but also communicated effectively to those most affected by and interested in the project's activities.

4.4 Optional Criterion: Exceptional Community Benefits

4.4.1 Short-term and Long-term Community Benefits (CCB, GL2.2)

The Katingan Mentaya Project has demonstrated that it is on track to generate both short-term and long-term net positive well-being benefits for smallholders and community members. This progress is evident through several key factors:

Short-Term Benefits

Alternative Livelihoods

The project has introduced diverse income-generating opportunities, such as agroecology, microfinance programmes, and ecotourism, which have provided immediate financial relief to smallholders and community members. These initiatives reduce dependency on unsustainable forest practices and provide more stable and secure income sources for vulnerable households. For instance, communities have reported increases in household income, and new employment opportunities have been created in agroforestry and environmental conservation. Research highlights the effectiveness of such programmes in enhancing financial resilience and reducing poverty (FAO, 2021; Gliessman, 2015).

Health and Education Improvements

Improved access to healthcare and education has directly benefited community well-being. About 2,417 local community members accessed healthcare services, and about 376 students and 20 teachers participated in environment and health educational programmes that support long-term environmental stewardship and personal development. The construction of health centres and the provision of clean water addressed critical short-term needs, significantly improving the quality of life in these communities. These improvements align with global evidence linking better access to health and education to enhanced community resilience (UNDP, 2020).

Capacity Building and Social Cohesion

Through targeted training programmes and participatory approaches, the project significantly enhanced community capacity during the 2020–2023 monitoring period. Across all 34 villages, a total of 2,364 community members (38% women) were trained in critical areas such as sustainable farming, biodiversity monitoring, fire prevention, agroecology, microfinance, and sustainable livelihood management. These activities were delivered through participatory training

sessions, field demonstrations, and community workshops conducted by zone facilitation teams. Documentation of attendance, participation records, and evaluation outcomes is systematically captured through the SIRETA monitoring system.

These capacity-building initiatives not only equipped individuals with new technical skills that improved productivity and income, but also strengthened social cohesion by fostering collaboration and mutual support. Joint activities involving LPHDs, KTH farmer groups, women's PKK groups, and youth associations—such as reforestation campaigns, health and hygiene initiatives, and participatory village planning—helped build trust and reinforce local governance structures. These efforts demonstrate measurable improvements in cooperation, collective decision-making, and long-term community resilience. Such capacity development is widely recognised as essential for enhancing livelihoods and promoting inclusive, community-driven development (Vanclay, 2003).

Long-Term Benefits

Sustainable Resource Management

The project's protection of 157,875 hectares of tropical peatland forest ensures the long-term viability of forest resources essential for smallholders and community members. By reducing deforestation, protecting biodiversity, and restoring degraded land, the project safeguards natural resources for future generations. Peatland ecosystems, in particular, play a critical role in global carbon storage and biodiversity conservation (Miettinen et al., 2016; Ancrenaz et al., 2021).

Climate Resilience

Peatland rewetting, fire prevention, and carbon sequestration efforts enhance the region's long-term resilience to climate change. These activities contribute to global climate mitigation and protect smallholder farming systems and local economies from climate-induced disasters like fires and droughts. Effective climate adaptation strategies like these are vital for securing livelihoods in vulnerable regions (IPCC, 2019).

Institutional Strengthening and Policy Integration

The project has successfully integrated local communities into decision-making processes, empowering them to influence policies related to land use, conservation, and development. The establishment of legal agreements and conflict resolution mechanisms further protects the rights of smallholders and marginalised groups, promoting equitable participation in development efforts. Such integration aligns with evidence suggesting that community-based governance leads to better conservation outcomes and greater equity (World Bank, 2014).

Long-Term Economic Stability

Sustainable business models, such as agroecological farming, eco-friendly commodity production, and ecotourism, ensure that the project's economic benefits extend beyond its lifetime. These models are designed to be resilient to external shocks, providing smallholders with financial stability and reducing dependence on unsustainable practices (Kassam et al., 2020).

Evidence of Progress

Increased Household Incomes

Average household incomes have risen across the project area, demonstrating the economic benefits of project interventions. A gradual rise in average annual household income was recorded between 2014 and 2023, reflecting the success of initiatives like alternative livelihoods and improved market access (FAO, 2021).

Positive Community Feedback

Feedback gathered through surveys and Focus Group Discussions (FGDs) reveals high levels of community participation and appreciation for project benefits. Women, in particular, reported increased involvement in decision-making processes and access to new income opportunities, contributing to enhanced social equity. Such outcomes demonstrate the project's success in promoting inclusivity and empowerment (UN Women, 2020).

4.4.2 Marginalised and/or Vulnerable Community Groups (CCB, GL2.4)

The following tables provide a detailed overview of the Katingan Mentaya Project's impact on various marginalised and vulnerable community groups. It outlines the net positive impacts generated by the project, the steps taken to ensure equitable access to project benefits, and the measures implemented to mitigate potential negative impacts on these groups. By identifying each community group, the tables demonstrate how the project has been designed to inclusively engage with local populations and support their long-term well-being, while addressing any challenges that might prevent them from fully benefiting from the project's activities.

Community Group	Women
Net positive impacts	Women have gained access to alternative livelihoods, including agroecology and microfinance programmes. Many are involved in decision-making processes, fire patrols, and environmental activities.

Benefit access	Programmes have specifically targeted women to ensure their inclusion. PT RMU organised female group discussions (FGDs) and participatory planning sessions where women's voices were actively included.
Negative impacts	Cultural barriers still limit women's involvement in public decisions. The project is promoting gradual cultural shifts through training and empowering women in public roles, mitigating negative impacts.
Community Group	Smallholder Farmers
Net positive impacts	Smallholder farmers benefit from sustainable agriculture and land management training. This has improved crop yields and reduced reliance on unsustainable forest clearing methods.
Benefit access	The project provides smallholder farmers with resources and training to access sustainable farming techniques, reducing barriers to better land use and increased productivity.
Negative impacts	The risk of income loss during the transition to new practices has been mitigated by the project offering financial support and continuous monitoring of economic impacts on farmers.
Community Group	Low-Income Households
Net positive impacts	Low-income households receive financial support through microfinance programmes and increased income opportunities via agroecology and reforestation jobs.
Benefit access	The project has reduced barriers by setting up microfinance programmes accessible to low-income households, offering loans and financial literacy training.
Negative impacts	The project team monitors household economic conditions and has set up grievance mechanisms to address any unintentional negative impacts, such as inadequate access to new income opportunities.
Community Group	Youth
Net positive impacts	Youth engagement in environmental education programmes and participation in conservation efforts have empowered

	them with knowledge and skills for future employment in sustainable sectors.
Benefit access	The project created programmes specifically targeting youth, providing education and opportunities for involvement in ecotourism, reforestation, and biodiversity monitoring activities.
Negative impacts	The project actively monitors youth participation to ensure inclusion and offers alternative pathways if economic or educational barriers are identified.

Community Group	Disabled Community Members
Net positive impacts	Disabled individuals are included in the project's community engagement programmes, providing them with opportunities to participate in less physically demanding activities.
Benefit access	The project has removed physical and social barriers for disabled community members by creating accessible roles within the project, ensuring their involvement and benefit access.
Negative impacts	The project has established tailored programmes to ensure that disabled members are not excluded and regularly monitors their participation, offering further support as needed.

Community Group	Elderly Population
Net positive impacts	The elderly benefit from social forestry programmes and community support networks established through the project's initiatives. This ensures continued access to resources and participation in community decision-making.
Benefit access	Special consideration is given to the elderly in community meetings, ensuring their perspectives are included. Benefits from reforestation and sustainable land use directly support their livelihood.
Negative impacts	The project has provided alternative income opportunities and supportive community roles to prevent exclusion or loss of traditional practices that could negatively affect the elderly.

4.4.3 Net Impacts on Women (CCB, GL2.5)

The Katingan Mentaya Project has successfully generated net positive impacts on the well-being of women and actively promoted their participation in decision-making processes. Here is a breakdown of how this has been achieved:

Net Positive Impacts on Women's Well-Being

Economic Empowerment:

Women have significantly benefited from the project's alternative livelihood programmes, particularly in agroecology, microfinance, and small-scale ecotourism initiatives. These programmes have provided women with new sources of income, reducing economic vulnerability and enhancing their financial independence.

Women's participation in microfinance programmes has resulted in increased access to credit and savings, enabling them to invest in their households and communities. This financial inclusion has allowed many women to improve their standard of living and contribute to family income.

Health and Education Initiatives:

The project's focus on improving healthcare access has directly benefited women, particularly through maternal health programmes, increased access to village health centres, and clean water initiatives. These health improvements have resulted in better outcomes for women and children.

Education programmes within the project area have also targeted women and girls, raising awareness about sustainable practices, healthcare, and financial literacy, which helps in improving their long-term well-being.

Increased Social Cohesion:

The project has fostered stronger social ties within the communities, which has had a positive impact on women's social status. Women have become more actively involved in community organisations and conservation activities, which in turn has empowered them socially and economically.

Women's Participation in or Influence on Decision-Making

Women have been central to the success of the Katingan Mentaya Project during the 2020–2023 monitoring period, participating across multiple dimensions including biodiversity monitoring, fire prevention patrols, reforestation, livelihood enhancement, and financial empowerment. More than 70% of women in project villages reported active participation in project programmes, with many assuming leadership positions within community groups, demonstrating increased visibility, agency, and decision-making power.

During this monitoring period, 11 women-led microfinance groups were actively operating across the project area, providing small loans, savings schemes, and financial literacy training to over 340 women. These groups are managed by women in key leadership roles—such as group leaders, treasurers, and facilitators—who oversee fund allocation and ensure transparent governance through revolving fund mechanisms. These activities were supported through ongoing mentorship from RMU facilitators, and their operation is verifiably documented through meeting minutes, SIRETA records, attendance lists, and MoU monitoring reports. Participation in these financial activities has increased women’s economic independence, strengthened household resilience, and enabled women to reinvest in sustainable livelihood activities such as agroforestry, rattan processing, and small-scale enterprises.

Women have also played a critical role in community decision-making processes. They were active participants in Focus Group Discussions (FGDs) and participatory planning sessions, where they articulated needs and priorities related to fire prevention, land use, health services, and livelihood development. In several villages, women’s inputs directly shaped decisions regarding community funds, conservation incentives, and health outreach. This direct engagement demonstrates that women are not only programme beneficiaries but also key contributors to project governance.

To address cultural barriers and promote long-term gender equality, the project has intentionally incorporated gender-responsive approaches such as women-only consultation forums, leadership training, and awareness-raising activities designed to increase women’s participation in public decision-making. These targeted interventions have resulted in measurable improvements in women’s confidence, negotiation capacity, and influence within village institutions. As a result, women in project villages are now recognised as essential stakeholders in environmental stewardship, economic planning, and community resilience.

4.4.4 Benefit Sharing Mechanisms (CCB, GL2.6)

The benefit-sharing plan for the Katingan Mentaya Project has been implemented through a range of community-focused initiatives aimed at ecosystem restoration and socio-economic development. This approach aligns with global best practices in benefit-sharing mechanisms, which emphasise the equitable distribution of benefits to local communities participating in conservation projects (Forest Carbon Partnership Facility, 2019).

Supporting 34 villages, the project includes activities such as agroecology, education, social forestry, healthcare, and microfinance. Implementation follows a participatory approach, utilising village meetings to prioritise and tailor activities to local needs. This participatory method is essential for ensuring that benefit-sharing arrangements are both effective and culturally appropriate (Food and Agriculture Organization [FAO], 2020).

Key groups, including the Forest Farmer Group, Forest Village Management Unit (LPHD), and the Koperasi Tani Agroekologi Lestari cooperative, have received training and operational support. These efforts enable sustainable forest resource management and the development of alternative livelihoods, such as Climate Smart Agriculture and women-led microfinance activities. Capacity-building initiatives like these are fundamental to fostering local ownership and long-term sustainability of benefit-sharing arrangements (Center for International Forestry Research [CIFOR], 2019).

The project has also provided targeted assistance to specific villages, such as Tampelas, addressing unique infrastructure and economic challenges. A Monitoring, Reporting, and Verification (MRV) system tracks the progress of these initiatives, while feedback from communities ensures that the programmes are refined to guarantee fair benefit distribution. Effective MRV systems are critical for assessing the success of benefit-sharing mechanisms and making necessary adjustments to achieve equitable outcomes (CIFOR, 2018).

Where stakeholders request privacy, elements of the benefit-sharing agreement are treated as commercially sensitive documents, with any changes, such as stakeholder renegotiation or opt-outs, being documented. Transparency, community engagement, and sustainability remain priorities, with flexibility to adapt to evolving community needs. Transparency and adaptability are vital for building trust and ensuring the long-term success of benefit-sharing plans (World Bank, 2012).

4.4.5 Governance and Implementation Structures (CCB, GL2.8)

Community perspectives and needs are systematically incorporated into project planning and implementation through a robust participatory governance framework anchored in the Musyawarah Desa (village assemblies) and continuous consultation processes. Each of the 34 partner villages conducts structured meetings where priorities, proposals, and concerns are discussed with project representatives ahead of inclusion in annual work plans and MoU-based fund allocations. This approach ensures that activities are co-developed with communities rather than externally imposed, promoting strong local ownership.

During the 2020–2023 monitoring period, the project facilitated over 900 community meetings and 200 participatory planning sessions, engaging 28,516 community members across diverse demographic groups, including women, youth, customary leaders, and farmer associations. Feedback collected through these processes directly shaped project decisions—for example, prioritising floating health services for riverine communities, scaling up agroecology training to strengthen food security, and expanding women-led microfinance groups to promote financial inclusion and economic resilience.

The project's implementation strategy integrates environmental protection with social well-being and economic empowerment. Programmes such as the Agroecology Farming Training promote no-burn, chemical-free farming methods, enhancing productivity and resilience to climate change while maintaining ecological integrity. Health and well-being are improved through innovative interventions like the floating health service, which ensures access to medical care in remote areas, demonstrating the project's commitment to equitable service delivery.

Furthermore, data collection and monitoring, conducted in compliance with Verra's VCS and CCB Standards, include active community participation and verification through MoUs with partner villages. This ensures full transparency, accountability, and alignment with national priorities and global sustainability frameworks.

Overall, the Katingan Mentaya Project demonstrates a successful model of community-driven climate action. Its governance and participatory structures ensure that smallholders and local stakeholders are not only beneficiaries, but active partners in achieving climate mitigation, biodiversity conservation, and sustainable development outcomes, delivering measurable impacts for both people and the planet.

4.4.6 Smallholders/Community Members Capacity Development (CCB, GL2.9)

The Katingan Mentaya Project has placed a strong emphasis on building the capacity of smallholders, community members, and local organisations or institutions to participate effectively and actively in project design, implementation, and management. Through a series of targeted initiatives and programmes, the project has developed the skills, knowledge, and organisational capacity of these key stakeholders, ensuring they are equipped to contribute meaningfully to every stage of the project. Here's how this capacity development has been achieved:

Capacity Building for Smallholders and Community Members

Training in Sustainable Land Use and Agriculture: The project provided extensive training to smallholders in sustainable agricultural practices, including agroecology, forest conservation, and land management techniques. These training programmes were designed to enhance productivity while minimising environmental impacts, enabling smallholders to transition away from unsustainable farming practices like slash-and-burn agriculture.

Results: Smallholders have adopted new, environmentally friendly techniques, increased crop yields and improved land management. This has allowed them to generate sustainable income and contribute to forest conservation efforts, demonstrating their active role in the project's implementation.

Skills Development in Reforestation and Conservation: Community members, including women and indigenous groups, received training in reforestation and biodiversity conservation. These programmes covered tree planting techniques, biodiversity monitoring, and fire prevention strategies. This has not only empowered participants to take ownership of conservation efforts but has also provided employment opportunities.

Results: Thousands of hectares of forest have been restored by trained community members, who now have the skills to manage reforestation and conservation efforts autonomously. This hands-on experience has developed their ability to actively participate in the project's long-term management.

Microfinance and Financial Literacy Training: The project offered financial literacy training to ensure that smallholders and community members could effectively manage income from alternative livelihoods. This training included bookkeeping, savings management, and basic business planning, which were essential for participating in RMU's microfinance initiatives.

Results: Many community members have improved their financial independence, with participants using microloans to start small businesses and manage their finances more effectively. This development has fostered their ability to engage in decision-making processes related to economic activities in their communities.

Empowering Local Organisations and Institutions

The project empowers local organisations and institutions—including village bodies, LPHDs, farmer groups (KTH), customary groups, cooperatives, and community-based organisations—to take a leading role in forest conservation, sustainable livelihoods, community forestry, and good agricultural practices. This is achieved through targeted capacity-building, fostering collaboration, and promoting community-driven initiatives that align with the Project Goal and contribute to the SDG target.

Support is also provided through the annual Village Fund, which finances infrastructure improvements, livelihood development, and community needs. Allocation decisions are made through inclusive village meetings (musyawarah desa) guided by the FPIC (Free, Prior, and Informed Consent) process. This ensures broad participation, transparency, and strengthens local governance, supporting the democratic process at the village level.

Results: The project has strengthened 44 local institutions, enhancing their capacity to implement sustainable livelihood initiatives, adopt good agricultural practices, and conserve forests. These efforts have also fostered increased transparency and stronger local governance, ensuring that communities actively participate in decision-making and development planning, thereby supporting democracy at the village level.

Strengthening Local Leadership and Governance Structures: The project worked closely with village leaders and local governance structures to strengthen their capacity for project management. This included training in leadership, conflict resolution, and project management, as well as support for the creation of local decision-making bodies that oversee project activities at the village level.

Results: Local leaders are now better equipped to lead discussions on project design and implementation, ensuring that community needs are met. These enhanced governance structures have improved the efficiency of project oversight and enabled more effective community-driven decision-making.

Establishing and Supporting Local Conservation Groups: The project facilitated the creation of local conservation groups, including fire prevention patrols and biodiversity monitoring teams. These groups were provided with training, equipment, and ongoing support to manage their responsibilities effectively.

Results: These local groups have taken the lead in monitoring and protecting key conservation areas, including High Conservation Value (HCV) forests. By empowering these groups, the project has ensured that conservation efforts are locally driven and sustainable.

Partnership with Local Institutions: The project has partnered with local institutions, such as the village planning offices (Bappeda) and educational institutions, to enhance their capacity in environmental management and community development. These partnerships involve joint capacity-building programmes focused on local policy integration, sustainable land use planning, and environmental education.

Results: Local institutions are now better integrated into the project's implementation and management processes, contributing expertise and resources to support long-term sustainability. They have become crucial stakeholders in the planning and coordination of activities, ensuring that the project aligns with regional development goals.

Participation in Project Design

Participatory Project Design Workshops: From the early stages, smallholders and community members were involved in participatory workshops where they helped design project interventions, such as livelihood programmes, reforestation activities, and conservation initiatives. These workshops were facilitated by RMU to ensure that local knowledge and preferences shaped the project's overall direction.

Results: The project's design reflects the needs and priorities of the community, which has led to stronger buy-in from local participants. Community members now feel a sense of ownership over the project, contributing ideas that have enhanced both the relevance and effectiveness of interventions.

Building Long-Term Management Capacity

Institutionalising Knowledge and Skills: The project has focused on ensuring that the knowledge and skills developed through the project are institutionalised within the community. This has included the creation of training manuals, the establishment of peer-to-peer learning networks, and the formalisation of roles for trained community members in ongoing project management. Results: The institutionalisation of these skills ensures that the capacity built through the project will be sustained over the long term. Community members and local organisations are now well-equipped to continue managing the project and other development initiatives independently.

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5 BIODIVERSITY

For the previous monitoring period (2020), the project opted to forego CCB verification for the sole reason of prioritising VCS verification and issuance only. For the avoidance of doubt, the current biodiversity monitoring period will include 2020-2023 for biodiversity so that it can retrospectively claim CCB Gold.

5.1 Net Positive Biodiversity Impacts

5.1.1 Biodiversity Changes (VCS, 3.19; CCB, B2.1)

The Katingan Mentaya Project seeks to protect 149,800 ha of largely intact peat swamp habitat from conversion to industrial agricultural plantation and drainage. It is categorised as a Key Biodiversity Area (KBA) by multiple criteria (see **section 5.4.1**). Due to the nature of the project seeking to maintain existing high levels of biodiversity, biodiversity change is largely limited to the potential for loss. As an intact system, there is far less scope for increase, due to natural biologically limiting factors. However, we report largely stable trends in biodiversity and threats to biodiversity in the table below.

During the current monitoring period, no material changes in monitored biodiversity indicators within the project area were observed. However, we acknowledge increasing pressure from anthropogenic threats such as illegal logging and forest clearance, both within the project zone and in the surrounding areas. Proactive measures are being implemented to address these emerging threats and mitigate their potential impacts. Some deforestation has occurred within the project area (see **Climate section 3**), and this corresponds to 461.8 ha of forest loss from illegal logging over the 2020-2023 period (see **Table 3.10**). Nevertheless, neither deforestation nor degradation is expected to have had a substantial impact on overall forest intactness or on populations of forest-dependent species within the project area during this monitoring period.

Recent hunting surveys indicate a decreasing trend in the offtake of selected species, aligning with an upward trend in livelihood diversification that may represent a shift away from subsistence-based hunting. Project activities have introduced more diverse livelihood options, reducing the reliance on hunting as a primary income source. While some individuals within the community continue to hunt, they appear to focus on fewer species and take fewer animals overall compared to 2016, likely alleviating pressure on wildlife populations (see **sections 5.1.3** and **5.3**).

Camera trap and line transect surveys conducted across the project area confirm the continued presence of a range of rare, threatened and endangered (RTE) species. Note that RTE species are defined as those that are listed as CR, EN and VU on the IUCN Redlist, as well as CITES (I-II) listed species, species endemic to Borneo and species that are nationally protected. These include the Sunda Pangolin (*Manis javanica*; CR), Bornean White-bearded Gibbon (*Hylobates albibarbis*; EN), Otter Civet (*Cynogale bennettii*; EN), and Hairy-nosed Otter (*Lutra sumatrana*; EN), amongst others. Monitoring results for Bornean Orangutan (*Pongo pygmaeus*; CR) indicate that their density within the project area has fluctuated since surveying began, with estimates during the current monitoring period ranging from 1.95 individuals per km² (95% CIs = 1.38, 2.76) in 2020 to 1.23 (95% CIs = 0.92, 1.65) individuals per km² in 2022. This represents a slight decline compared to the densities at the start of the last monitoring period, which were estimated at 2.26 individuals per km² (95% CIs = 1.52, 3.36) in 2018. However, this change is unlikely to be statistically significant due to overlapping confidence intervals. These findings suggest relative population stability amidst natural fluctuations, confirming that the project area continues to support an important population of orangutans (see **sections 5.3** and **5.4** for full details of orangutan monitoring).

Change in Biodiversity #1	Forest extent and quality
Monitored Change	The data provided in the Climate section 3.1.3 , shows that there has been relatively consistent vegetation growth and an overall increase in aboveground biomass during this monitoring period, particularly in areas that were previously degraded. The overall net growth rate corresponds to 0.5 tC/ha/yr across the four-year period (see Figure 5.1). An overall increase in aboveground biomass reflects natural forest regeneration within the project area, which over time will lead to an increase in the area covered by high quality forest habitats, or habitats that are ecologically more similar to old-growth ('primary') forest. However, full recovery or regeneration of forest habitat following disturbance can take many years, depending on the severity of the initial degradation. We will continue to monitor forest regeneration over time, but these results are encouraging and suggest that the habitat is recovering from high intensity logging activities in previous decades.
Justification of Change	We anticipate that increases in aboveground biomass will accumulate over time due to natural forest regeneration, as observed in similar studies (e.g., Philipson et al., 2020). This will likely result in the

expansion of higher-quality forest habitats within the project area, which can support greater biodiversity. We define forest (or vegetation) quality as a biodiversity indicator that reflects overall forest structure and composition, including tree height, size, diversity, canopy cover, and forest strata (Whitmore, 1975), alongside other ecological aspects of the vegetation. In heavily degraded logged forest areas, such as those found in the Katingan Mentaya Project, aboveground carbon and canopy height are likely to be significantly lower compared to unlogged forests (Asner et al., 2018; Okuda et al., 2019). This degradation is primarily due to the removal of large trees (e.g., dipterocarp trees), which are crucial for forest structure, function, and carbon storage (Brearley et al., 2016; Slik et al., 2013). In these logged forests, aboveground biomass (i.e., carbon density) serves as a useful proxy for forest quality, as higher carbon levels correlate with the presence of larger trees and structural attributes more akin to old-growth forests. Although degraded forests can still have high biodiversity value (Edwards et al., 2011), structurally complex or undisturbed habitats are generally necessary to support many forest specialists (Meijaard et al., 2005; Peh et al., 2005) and to enhance ecosystem functioning (Slade et al., 2011). The increase in aboveground biomass resulting from natural forest regeneration in the project area can be attributed to several factors, that include:

Protection from conversion to acacia plantations: Following project inception in 2010, conversion of forest to acacia plantations was prevented. This protection has stopped large-scale forest degradation, including the removal of large, commercially valuable dipterocarp tree species, which would have reduced canopy height and altered habitat structure, resulting in severe biodiversity losses. By halting plantation conversion, many areas of forest in the Katingan Mentaya Project have been allowed to regenerate naturally, without the removal of native vegetation for fast-growing plantation species.

Minimal forest disturbance: Over the course of the monitoring period, 461.8 ha of forest loss occurred within the project area due to illegal logging. However, this represents only ~0.3% of the total 149,800 ha project area. While small-scale deforestation and illegal logging have resulted in varying levels of degradation in some areas, the overall forest ecosystem remains largely intact and continues to play a critical role in biodiversity conservation. The ongoing protective measures,

	including the prevention of large-scale logging and conversion, have allowed for natural forest regeneration, contributing to an overall increase in aboveground biomass. These efforts highlight the effectiveness of the project's conservation strategies in mitigating habitat loss, enhancing forest quality, and protecting this important area of forest habitat. Continued protection of the forest ensures the conservation of intact habitat over time. Protection measures include fire prevention as well as the prevention of agricultural clearing through ongoing security patrols and engagement with relevant authorities. Tree planting and natural regeneration of degraded areas are also thought to have contributed to an overall increase in tree cover, which is reflected in the increase in aboveground biomass. This natural regeneration process is gradually expanding high-quality forest habitats, although full recovery may take many years depending on the extent of degradation. We will continue to monitor forest regeneration over time but maintaining forest extent will be critical for supporting populations of forest-dependent species, such as the Bornean Orangutan (<i>Pongo pygmaeus</i>) and Proboscis Monkey (<i>Nasalis larvatus</i>), and for enhancing ecosystem resilience. While some forest loss has occurred due to illegal logging throughout the monitoring period, we will persist in our patrolling, monitoring, and community engagement efforts to mitigate these activities and preserve and restore the forest.
Change in Biodiversity#2	Flagship Species
Monitored Change	<u>Orangutan Population Change:</u> During the current monitoring period, overall orangutan density ranged from 1.95 individuals per km² (95% CIs = 1.38, 2.76) in 2020 to 1.23 individuals per km² (95% CIs = 0.92, 1.65) in 2022, showing fluctuations in the overall population, but no statistically significant change over these years, as indicated by overlapping confidence intervals. It is important to note that for a long-lived species such as the orangutan, we focus less on year-to-year variations and more on trends observed across monitoring periods. These orangutan density estimates corresponded to an estimated population of 2,662 (95% CIs: 1881-3768) individuals within 136,729.44 ha of remaining forest in the project area in 2020 and 1,678 (95% CIs: 1253-2249) within 136,374.06 ha of forest in 2022. In 2023, only four sites were surveyed during this year (Bakumin-Hanaut, Galinggang, Kanal Selatan

	and Terantang), three of which were new sites selected for having ‘low-pole’ (tree) density, resulting overall orangutan density of 0.34 (95% CIs = 0.16, 0.74). The low density for 2023 is primarily due to the inclusion of three new sites, which were selected specifically for their lower-density characteristics. Hence, these figures from 2023 should not be used to compare with previous estimates. Orangutan density during the current monitoring period (2020-2023) was slightly lower than during the previous 2018-2019 monitoring period. Our updated estimates indicate that during 2018 and 2019, orangutan density ranged from 2.26 (95% CIs = 1.52, 3.36) in 2018 and 1.68 (95% CIs = 1.26, 2.25) in 2019. This represented populations of 3,101 (95% CIs = 2086-4611) individuals in 2018 and 2,301 (95% CIs = 1726-3082) individuals in 2019 across 137,232 ha and 136,991 ha of forest, respectively, in those years. For full details of the orangutan monitoring see sections 5.3 and 5.4 and the ‘Orangutans MR full report 2020-2023.docx’ report in the ‘Flagship Species: Orangutans’ supporting evidence folders.
Justification of Change	Our monitoring results indicate that orangutan density within the project area has fluctuated since surveys began in 2002, but that there is relative stability within the context of natural population fluctuations. However, whilst every effort was made to standardise the monitoring results, variations in survey effort and sampling site locations over time mean that direct comparisons across monitoring periods should be interpreted with caution. This is because changes in survey methodologies and the expansion of monitoring sites over the years likely contribute to some of the differences observed in density estimates. However, despite these fluctuations, the project area continues to support a significant and important orangutan population, whereby estimates align with previous densities from prime orangutan habitats elsewhere in Borneo. These include the Sebangau National Park (1.82 individuals per km²; Vogel, 2012) and the Danum Valley Conservation Area in Sabah, a primary lowland dipterocarp forest (1.37 individuals per km²; Simon et al., 2019). Based on these observations, we will maintain a core set of sampling sites to ensure consistency in orangutan monitoring through time moving forwards. We will also explore potential new sites and assess the feasibility of helicopter

	surveys to cover a larger portion of the project zone, including areas that are otherwise inaccessible.
Change in Biodiversity #3	RTE Species (also referred to as HCV species)
Monitored Change	Camera trapping has been a key method for monitoring biodiversity change in the project area, especially for ground-dwelling birds and mammals, many of which are RTE species. This technique is particularly effective for detecting elusive species, providing valuable data on species presence, encounter rates, and spatial distribution. The primary objective of camera trapping in the project area was to fill knowledge gaps about the use of the project area by RTE species and to document their continued presence over time. The camera trap sampling design in the project area was therefore tailored to balance available resources and logistical constraints, ensuring comprehensive coverage. Between February 2020 and November 2023, 20 camera traps were deployed across six ~8,000-hectare blocks, systematically placed in a 2x2 km grid. The cameras were relocated every three months across different sampling blocks, covering a total of 571 sub-grid cells. During this monitoring period, 75 species were recorded from our camera trap monitoring, including two Critically Endangered (CR) species (Bornean Orangutan: <i>Pongo pygmaeus</i> and Sunda Pangolin: <i>Manis javanica</i>), eight Endangered (EN) species (including Sunda Clouded Leopard: <i>Neofelis diardi</i>), 10 Vulnerable (VU) species and five species that are endemic to Borneo. Notably, encounter rates for these species remained consistent with previous periods, although the percentage of locations with recorded orangutans appeared to decrease (from 41% to 24%). New species recorded in this period included the Proboscis Monkey (<i>Nasalis larvatus</i>) and Bornean White-bearded Gibbon (<i>Hylobates albibarbis</i>), among others. The encounter rate for the Sunda Pangolin increased from 0.5/1000 to 1/1000 trap days, highlighting the continued presence of this elusive and highly threatened species in the project area. These results provide critical insights for ongoing conservation strategies, highlighting both the persistence of target species and the need for continued monitoring and management interventions. For full details of the camera trap surveys see sections 5.3 and 5.4 and the 'Camera trapping MR full

	report 2020-2023.docx report in the 'RTE Species: Camera Trapping' supporting evidence folders.
Justification of Change	<u>Continued presence of RTE species:</u> All categories of threatened species including CR, EN, or VU on the IUCN Red List that were recorded during the last 2018-2019 monitoring period via camera trapping were also confirmed during this period, highlighting the continued presence of these species of conservation concern. All RTE species records for this monitoring period can be found in the 'RTE Records for MR 2020-2023.xls' file in the 'RTE Species' supporting evidence folder. There also appeared to be no major changes in encounter rates for CR, EN, and VU species found between monitoring periods. From 2020 to 2023, extensive camera trapping across six sampling blocks in the project area has provided critical data for biodiversity monitoring, particularly for RTE species. This effort has yielded valuable insights into species presence, encounter rates, and distribution, directly informing our conservation planning and management strategies. The findings confirm the continued importance of the project area as a biodiversity hotspot, with the sustained presence of key species such as the Sunda Pangolin (<i>Manis javanica</i>; CR), Sun Bear (<i>Helarctos malayanus</i>; VU), Bornean Crestless Fireback (<i>Lophura pyronota</i>; EN), and Flat-headed Cat (<i>Prionailurus planiceps</i>; EN). These results highlight the success of the project in protecting high-quality forests and preventing their conversion into large-scale acacia plantations, which would have likely led to significant declines in many forest-specialists. While the current analysis of camera trap data provides important patterns in species presence, future efforts will focus on more detailed evaluations, including more advanced analyses of species abundance and occupancy where possible. These will help assess the impact of project interventions and improve our understanding of species dynamics and habitat use in the project area.
Change in Biodiversity #4	Anthropogenic threats to biodiversity
Monitored Change	We continue to actively monitor the main anthropogenic threats to biodiversity within the project area, including fires, illegal logging and hunting. Project initiatives include regular patrols, community

	engagement, and collaboration with law enforcement agencies. Some threats to biodiversity have persisted or increased during the monitoring period and we summarise these changes below. <u>Hunting</u> During the 2021–2023 monitoring period, three hunting surveys were conducted across 31 villages within the project zone, with no surveys taking place in 2020. The results found that whilst there is still some hunting pressure in the project zone, although there has been a reduction in the annual offtake of certain fauna during the monitoring period. <u>Logging</u> Approximately 461.8 ha of forest has been lost by illegal logging during 2020-2023 (see Table 3.10). While the amount of deforestation relative to the large size of the project area (461.8 ha out of 149,800 ha, or 0.3%) is relatively small and unlikely to have significant impacts on biodiversity, the rate of forest loss and degradation from logging activities has been increasing in recent years and needs to be addressed explicitly. <u>Fires</u> Fires have been monitored both on the ground by the RMU team and through remote sensing fire hotspot data. No fires have occurred in the project area since 2020. For full details of how we monitor anthropogenic threats, see Climate section 3 for details on the remote sensing and fire hotspot monitoring, as well as sections 5.3 and 5.4 for on the ground monitoring activities. Additional details are provided in the supporting files within the ‘Anthropogenic Threats: Patrols’, ‘Anthropogenic Threats: Fires’ folders and the ‘Hunting MR full report 2020-2023.docx’ file in the ‘Anthropogenic Threats: Hunting’ folders.
Justification of Change	<u>Hunting</u> Several factors may have influenced the decline in hunting offtake since the surveys began. First, patrolling activities within the project zone have increased since 2016, with additional measures, such as the installation of signposts, implemented after 2018. These enhanced protection efforts have likely made access to the project area more

difficult and may have contributed to the observed decline in species offtake. This reduction could also be attributed to increased community engagement by the RMU team, which has raised awareness about the illegality of hunting activities (RMU team, pers. comms.; also see **Community section 4**). Additionally, the project has offered alternative livelihoods, reducing reliance on forest resources (see **Community section 4**). For instance, household incomes have increased in certain sub-districts, with a number of households now having more than one working member. This shift reflects a diversification of income sources – such as firefighting, forest patrolling, restoration, rewetting, and agroforestry – stemming from project activities. Such economic diversification is crucial for building resilience within these communities.

Logging

Illegal logging continues to be a substantial threat to biodiversity in the project area and appears to be increasing. Although patrols and law enforcement collaboration continue to act as a deterrent, the ongoing presence of illegal logging activities in remote sections of the forest highlights the need for continued vigilance. The project has been working closely with local authorities and communities to address this issue, through regular monitoring, increased patrolling, and direct engagement with illegal loggers. The adoption of stricter regulations and enforcement measures is essential to further mitigate this threat. The project is also working to raise awareness about the long-term impacts of illegal logging on local biodiversity and ecosystem health, encouraging sustainable practices and alternative livelihoods (see **Community section 4**).

Fires

During the monitoring period there were no recorded instances of fires in the project area. This in part, can be attributed to the enhanced fire management and prevention fire strategy that has been adopted, which includes the following:

1. *Early detection:* Utilising various sources of hotspot information, including satellite data from OroraTech, NASA, VIIRS (NOAA, SUOMI NPP), MODIS (Aqua, Terra), SIPONGI, LAPAN Fire Hotspot, and BRIN Hotspot (see **Climate section 3**). Additional sources include community reports, fire

	observation towers, direct field findings, and SMS/email alerts. 2. <i>Social engagement</i>: Building strong relationships and collaboration with local communities to promote awareness and support for forest conservation efforts (see Community section 4). 3. <i>Patrol and monitoring</i>: Conducting regular field patrols to monitor and prevent illegal activities and forest fires within the project area (see section 5.3). 4. <i>Infrastructure development</i>: To support forest patrol and forest fire prevention activities. (see Climate Section 3). <i>Institutional support</i>: Developing Standard Operating Procedures (SOPs), organisational structures, and human resources to enhance forest fire prevention efforts (see Climate section 3).
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5.1.2 Mitigation Actions (VCS, 3.19; CCB, B2.3)

The activities and processes implemented to mitigate negative impacts on biodiversity, as well as measures taken to maintain and/or enhance HCV attributes in the Project Area, are described below. Given that the project area supports a high number of RTE species (HCV 1; see **sections 5.1 and 5.3**), is part of a large, Intact Forest Landscape (IFL) (HCV 2), contains rare and threatened ecosystems (HCV 3), and provides important ecosystem services (HCV 4), the entire forested area can be considered as supporting HCVs and is treated accordingly. See the files in the ‘**PDD HCV Assessment**’ folder for maps of the HCV areas and a breakdown of the HCV sub-categories following the national HCV guidance for Indonesia.

As described in the PDD, the baseline activity is identified as planned deforestation and peatland drainage due to the potential conversion of land to industrial acacia (pulpwood) plantations (see **section 3.1.4** of the **2020 PDD**). The project is therefore categorised as Avoiding Planned Deforestation (APD) in combination with Conservation of Undrained and Partially Drained Peatland (CUPP) and Rewetting of Drained Peatland (RDP) activities. Consequently, potential sources of leakage emissions arise from the displacement of planned deforestation activities and ecological leakage due to possible changes in mean annual water table depth in adjacent areas. These potential sources are addressed in the VCS Methodology VM0007 Modules LK-ASP and LK-ECO, which are identified as the applicable modules for the quantification of total leakage emissions.

Maintenance and enhancement of HCV attributes

Patrols:

To protect the project's forest area from threats such as fire, illegal logging, mining, hunting and destructive fishing, several key initiatives have been implemented. These include land and water patrols, manned guard posts, satellite and drone monitoring, and active community and stakeholder engagement. During the current monitoring period (2020–2023), the project collaborated with various teams, including the PMKK subdivision under PMK (Area Monitoring and Protection Division of RMU), fire preparedness groups, and joint patrols with authorities and law enforcement agencies, such as Water & Air Police officers. The technical and field teams monitor the presence of fires within the project area and surrounding zones, and if a fire occurs, they evaluate the best course of action to prevent its spread.

Project staff are actively engaged in nearly all the villages within the project zone, supporting efforts to promote sustainable activities among communities. Community members are encouraged to participate in forest protection, conservation, and restoration initiatives, which include awareness talks and presentations about the project's objectives and programmes to foster sustainable livelihoods. Additionally, the project team works closely with the Natural Resource Conservation Agency (BKSDA) for wildlife rescue efforts and coordinates with other authorities, such as the Water & Air Police, to address protection issues.

During the current monitoring period (2020–2023), a total of 3,315 patrols were conducted. This includes 3,222 patrols for fire prevention and 93 patrols targeting other threats, such as illegal logging, wildlife hunting, and unsustainable fishing. During these patrols, the team also occasionally recorded the presence of interesting flora and fauna in an ad hoc manner. Forest fire patrols were conducted across the project zone, with the most intensive patrols carried out in the Seranau area, followed by Mendawai, Kamipang, and Pulau Hanaut zones. As a result of these efforts, zero fires were recorded in the project area during the 2020–2023 period.

The 93 patrols targeting illegal logging and other threats covered a total of 2,075 km. From these patrols, the team documented 38 signs of fishing activities (such as huts), although no indication of illegal fishing methods (e.g., electrocution or poison) were detected. Additionally, 1,743 signs of illegal logging activities were found, including camps or piles of timber, and 12 signs of illegal mining. The monitoring results are taken seriously and will directly inform adaptive management strategies to ensure the continued maintenance and enhancement of HCV attributes. These findings reinforce the importance of ongoing patrols, community engagement, and collaboration with authorities to address threats such as fire, illegal logging, and hunting. By integrating these insights into future planning, the project remains committed to safeguarding the forest and its

biodiversity while fostering sustainable livelihoods within the project zone. See the files in the **'Anthropogenic Threats: Patrols'** supporting folders for evidence of the patrols that have taken place during the monitoring period.

Remote sensing:

Remote sensing tools have been integral to continuously monitoring the project area, providing near real-time information on forest conditions during the monitoring period (see **Climate section 3.1.3** for further details). NASA-FIRMS (<https://firms.modaps.eosdis.nasa.gov/map/>) and Global Forest Watch (<https://www.globalforestwatch.org/>) fire and deforestation alerts were used to deliver near real-time data. This information guided RMU and/or Permian field teams to inspect specific locations where deforestation or logging activities were suspected. In addition to automated Earth Observation (EO) alerts, the Permian technical team conducted weekly assessments of the project area using Planet high-resolution imagery (3 meters per pixel). These assessments helped verify and refine findings from EO alerts and identify emerging threats. During the monitoring period, advanced fire alert tools were integrated into the monitoring system to improve the detection and response to disturbances. Until 2023, the fire team relied primarily on NASA-FIRMS as the main satellite-based alert system. However, from late 2023, the project incorporated the OroraTech Wildfire solution into its fire monitoring system (Orora Technologies, 2020; <https://ororatech.com/>). The OroraTech solution has significantly enhanced temporal and spatial accuracy in fire detection and event assessment, providing a more robust mechanism for mitigating fire-related risks.

Biodiversity monitoring:

Permian field teams have conducted regular biodiversity monitoring activities within the project area, utilising a range of methods including remote sensing to assess forest intactness and quality, camera trapping, line transect surveys, and freshwater fish surveys (see **section 5.3**). Camera traps are strategically deployed to document species presence and behaviour, particularly for elusive or nocturnal species, while line transect surveys are conducted regularly across up to seven locations to monitor species presence over time.

These methods adhere to best practices in wildlife monitoring, ensuring the collection of robust data to inform adaptive management and conservation planning. The monitoring efforts focus particularly on forest specialists and species of conservation concern (i.e., RTE species). Continuous monitoring facilitates the early detection of negative biodiversity trends, enabling the implementation of timely interventions. This approach is consistent with the precautionary principle, ensuring proactive measures are taken based on available data.

Peatland rewetting:

By blocking drainage canals, the project reintroduces water into dried peatlands, preventing peat from oxidising and releasing carbon dioxide. This rewetting process helps restore the natural water balance of the ecosystem. As part of these initiatives, water retention ponds have been created. These ponds help maintain wet conditions in the forest and significantly reduce the risk of fires, a major threat in drained peatlands. Local communities are actively involved in these rewetting projects, ensuring that the efforts are sustainable and aligned with the needs of residents. A recent proposal outlines the rewetting plan for the project area, and the report details which canals need to be blocked, their prioritisation, the proposed methods, as well as the anticipated costs of implementing the plan (e.g., see '**Rewetting plan - Sekat_Kanal_I_II_KLHK.xls**' file in the supporting evidence '**Forest Extent and Quality: Rewetting**' folders). Further monitoring and systematic biodiversity assessments will be needed to evaluate the long-term ecological impacts of rewetting.

Replanting of degraded areas:

The Katingan Mentaya Project focuses on the large-scale restoration of tropical peat swamp forests, which are vital for biodiversity conservation and climate mitigation. As part of this initiative, the project has undertaken extensive replanting efforts to restore degraded lands. Between 2010 and 2020, over 1,895.8 hectares were replanted, with an additional 1750 hectares restored between 2021 and 2023. During the most recent period (2021-2023), more than 210,892 seedlings were planted, with every seedling recorded by species and family name annually. This replanting effort is an ongoing initiative of the project, demonstrating its commitment to long-term forest recovery and ecosystem health. The '**Replanting Plan 2024-2033.xls**' file in the '**Forest Extent and Quality: Replanting**' supplementary folders outlines the planting and replenishment programme planned for 2024 to 2033, detailing the project's continued efforts to restore and sustain the Katingan region's landscape. In addition, details of seedling planting and areas planted can be found in the '**KMP Seedling Planted for Intensive Restoration.xls**' spreadsheet also in the '**Forest Extent and Quality: Replanting**' supplementary folders.

Consistency with the Precautionary Principle :

The actions taken in the project area are consistent with the precautionary principle, as articulated in the 1992 Convention on Biological Diversity. This principle emphasises that the lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation. Specifically:

1. Assumption of species presence: The assumption that species documented in the surrounding landscape are likely to be present in the project area, given the similar forest type, supports the need for protection even in the absence of full scientific certainty. This approach aligns with the precautionary principle by erring on the side of caution to protect biodiversity.
2. Proactive protection measures: The protection of the project area, including efforts to halt potentially harmful activities such as logging, hunting, and forest conversion to acacia plantations, demonstrates a commitment to safeguarding biodiversity based on available evidence and precautionary reasoning. While proactive measures such as patrols, community engagement, and reforestation have significantly mitigated major environmental harm, some damage to the forest biodiversity from illegal logging and ongoing hunting activities has occurred and still requires attention. Through the implementation of these activities and processes, the project not only reduces negative impacts on biodiversity but also actively enhances the HCV attributes of the project area, promoting long-term ecological stability and alignment with international conservation principles. Although challenges remain, the project continues to adapt its strategies to address threats and ensure the effective maintenance and enhancement of biodiversity and HCV attributes.

5.1.3 Net Positive Biodiversity Impacts (VCS, 3.19; CCB, B2.2, GL1.4)

The project continues to deliver significant net positive biodiversity benefits compared to the baseline scenario. During this reporting period, the project implemented a range of activities aimed at minimising forest loss caused by fires, illegal and unsustainable hunting, illegal logging, and improving forest resilience to climate change by maintaining the site's natural habitat, ecosystem functioning and hydrology (see **Climate section 3** for further details). Under the baseline scenario, it is estimated that approximately 21,000 ha of the project area would have been deforested and drained during this monitoring period due to plantation development activities. Such deforestation would have increased hunting pressure and fire risks by lowering the water table and facilitating access. This loss of habitat would have had significant negative impacts on the area's biodiversity. A comprehensive list of flora and fauna within the project area is available in the '**KMP All Species List for MR Fauna 2023.xls**' and the '**KMP All Species List for MR Flora 2023.xls**' files in the '**Species Lists**' supporting evidence folder, respectively. Specific parameters monitored for biodiversity are detailed below in **section 5.3.1**. Several aspects of the project's performance merit further discussion.

Species and habitat

The project area consists primarily of low-lying, intact peat swamp forest and freshwater habitats that support high levels of biodiversity. Peat swamp forests are unique tropical wetland ecosystems characterised by waterlogged conditions that create peat soils from accumulated, undecomposed plant material. These ecosystems are biodiversity hotspots, providing critical habitat for numerous RTE species. However, they face significant threats from draining, burning, and clearing in Indonesia (Harrison et al., 2020). Peat swamp habitat supports extremely high numbers of RTE species, and at least 34 flora and 75 fauna species that are listed as threatened (CR, EN or VU) have been recorded in the project zone since the project's inception (see below, **section 5.3** and the '**KMP Proposed RTE_HCV Species List & Status for MR 2020-2023.xlsx**' file in the '**RTE Species**' folder in the supporting information). Below is a summary of RTE and endemic species by taxonomic group, with key highlights on their global and local conservation status in the project area/zone. Note that this list also includes species that have been recorded in the project area, but not during this monitoring period. During this monitoring period, 49 threatened (i.e., CR, EN and VU) fauna species were recorded through our monitoring activities (e.g., line transects, camera traps and freshwater fish surveys), as well as from incidental encounters. This included two CR species, 19 EN species and 28 VU fauna species. In addition, 46 species listed on CITES appendices I or II were recorded, along with 62 nationally protected species and 23 Borneo endemics. This corresponded to 106 RTE species detected in total during the monitoring period. A full species list is provided in the '**KMP All Species List for MR Fauna 2023.xls**' file in the '**Species Lists**' supporting evidence folder along with a status update and summary of each RTE species listed as CR, EN or VU in the '**KMP Proposed RTE_HCV Species List & Status for MR 2020-2023.xlsx**' file. Updates on global status have primarily referred to the IUCN Red List (<https://www.iucnredlist.org/>).

List of RTE species found since the project's inception:

Mammals

Critically Endangered:

- **Bornean Orangutan** (*Pongo pygmaeus*): Globally Critically Endangered due to habitat loss, degradation and hunting. Locally present in the project area with spatio-temporal variations in density.
- **Sunda Pangolin** (*Manis javanica*): Globally Critically Endangered due to illegal wildlife trade. Present in the project area and has been detected in various habitats.

Endangered:

- **Proboscis Monkey** (*Nasalis larvatus*): Endemic to Borneo, threatened by habitat loss and hunting. Present along riverbanks and in mangrove habitats within the project area.
- **Bornean White-bearded Gibbon** (*Hylobates albibarbis*): Threatened by habitat loss and hunting. Detected annually in nearly all monitoring locations.
- **Hairy-nosed Otter** (*Lutra sumatrana*): Rarest otter species in Asia, threatened by habitat loss. Detected in various habitats within the project area.
- **Sunda Clouded Leopard** (*Neofelis diardi*): Threatened by habitat loss and poaching. Recorded in the interior of peat swamp forests, as well as former logging areas.
- **Flat-headed Cat** (*Prionailurus planiceps*): Threatened by wetland and lowland forest destruction. Recorded in intact peat swamp forests.
- **Otter Civet** (*Cynogale bennettii*): Threatened by habitat loss. The project area is considered a globally important habitat for this species.
- **Long-tailed Macaque** (*Macaca fascicularis*): Threatened by human-wildlife conflict, hunting, and trade. Detected in various habitats within the project area.
- **Southern Pig-tailed Macaque** (*Macaca nemestrina*): Endangered due to habitat loss, hunting, and trade. Locally, widely distributed and frequently recorded in various habitats.
- **Large Flying Fox** (*Pteropus vampyrus*): Now classed as Endangered due to significant population declines as a results of unsustainable hunting and habitat loss.

Birds

Critically Endangered:

- **White-shouldered Ibis** (*Pseudibis davisoni*): Not recorded during the monitoring period, but thought to be present.
- **Helmeted Hornbill** (*Rhinoplax vigil*): Not recorded during the monitoring period, but thought to be present.

Endangered:

- **Storm's Stork** (*Ciconia stormi*): Threatened by forest clearance. Locally, confirmed presence around the Katingan River.
- **Greater Green Leafbird** (*Chloropsis sonnerati*): Threatened by trapping for the cage bird trade. Confirmed presence at four locations.
- **Javan White-eye** (*Zosterops flavus*): Threatened by trapping and habitat loss. Recorded in coastal pine forest and mangrove areas in the project zone.
- **Far Eastern Curlew** (*Numenius madagascariensis*): Threatened by habitat loss and hunting along its migration route. Recorded with numerous sightings in the project zone during winter migratory seasons.
- **Great Knot** (*Calidris tenuirostris*): Threatened by the reclamation of non-breeding stopover habitats. Recorded in the project area with numerous sightings.
- **Wrinkled Hornbill** (*Rhabdotorrhinus corrugatus*): Threatened by forest loss and hunting. Recorded through direct observations and camera traps.
- **Bornean Crestless Fireback** (*Lophura pyronota*): Threatened by habitat loss and hunting. Recorded through direct observations and camera traps.

- **Lesser Sandplover** (*Charadrius mongolus*): Migratory species, threatened by habitat degradation in stop-over/overwintering areas. Detected in the project zone during waterbird monitoring.

Reptiles

Critically Endangered:

- **Malaysia Giant Turtle** (*Orlitia borneensis*): Threatened by exploitation. No observations during the monitoring period, but local reports exist.

Endangered:

- **Southeast Asian Box Turtle** (*Cuora amboinensis*): Threatened by illegal trade. Not recorded during this monitoring period but the population is assumed stable or improving due to habitat protection.
- **Spiny Turtle** (*Heosemys spinosa*): Threatened by trade and habitat loss. Assumed stable or improving due to habitat protection.
- **False Gharial** (*Tomistoma schlegelii*): Threatened by habitat loss and incidental capture. Assumed stable or improving due to habitat protection.

Fish

Endangered:

- **White-edge Whipray** (*Fluvitrygon signifer*): Threatened by by-catch in fisheries. Recorded in the Katingan River.
- **Foersch's Betta** (*Betta foerschii*): Threatened by habitat degradation. Cited during the current monitoring period.
- **Asian Arowana** (*Scleropages formosus*): Threatened by habitat degradation and overfishing. No recent sightings.
- Unnamed species (*Leiocassis myersi*): Threatened by habitat degradation. No recent sightings.
- Unnamed species (*Sphaerichthys vaillanti*): Threatened by habitat degradation and trade. No recent sightings.
- **Peppermint Pikehead** (*Luciocephalus aura*): Threatened by habitat degradation and trade, within this monitoring period, fish specimens morphologically resembling this species were recorded.

Plants

Critically Endangered:

- **Bintangur** (*Calophyllum calcicola*): Endemic to Indonesia, with a limited area of occupancy.
- **Ramin** (*Gonystylus bancanus*): Threatened by habitat loss due to logging and conversion to plantations.
- **Meranti Bunga** (*Shorea teysmanniana*; formally *Rubroshorea*): Threatened by habitat loss due to logging and conversion to plantations.
- Unnamed species (*Dipterocarpus coriaceus*): Threatened by deforestation and habitat loss across its native range.

Endangered:

- **Alau** (*Dacrydium pectinatum*): Threatened by habitat loss and fragmentation due to logging and conversion to plantations.
- Unnamed species (*Calophyllum aureum*): Limited area of occupancy across few scattered locations.
- Unnamed species (*Shorea platycarpa*) (formally *Rubroshorea*): Threatened by habitat loss due to logging and conversion to plantations.

- Unnamed species (*Shorea uliginosa*) (formally *Rubroshorea*): Threatened by overharvesting, habitat loss due to logging and conversion to plantations.
- **Resak Durian** (*Cotylelobium burckii*): Threatened by habitat loss and fragmentation, endemic to Borneo.
- **Senkuang** (*Dracontomelon costatum*): Threatened by habitat loss and fragmentation due to logging and conversion to plantations.
- Unnamed species (*Shorea bracteolata*): Threatened by habitat loss and fragmentation due to logging and conversion to plantations.
- Unnamed species (*Shorea pallidifolia*): Threatened by habitat loss and fragmentation due to logging and conversion to plantations.

Newly Proposed RTE Species

In addition to the existing RTE species, we have identified a newly proposed list of species to be included for monitoring by the project in the subsequent period. These additions are primarily due to changes in their status on the IUCN Red List or national protection classifications. The complete list is provided in the supporting information 'KMP Proposed RTE_HCV Species List & Status for MR 2020-2023.xlsx' file, with key highlights summarised below based on the updated IUCN Red List status

Near Threatened (NT), but nationally protected: 9 species

- **Bornean Yellow Muntjac** (*Muntiacus atherodes*) - recorded in 2020 and 2021.
- **Marbled Cat** (*Pardofelis marmorata*) - consistently detected annually in six locations.
- **Wreathed Hornbill** (*Anorrhinus galeritus*) - recorded at six locations.
- **Red-headed Trogon** (*Harpactes duvaucelii*) - consistently detected.
- **Red-crowned Barbet** (*Psilopogon rafflesii*) - detected at nearly all monitoring locations.
- **Crimson Sunbird-Trogon** (*Harpactes kasumba*) - detected in 2021.
- **Grey-headed Fish-eagle** (*Ichthyophaga ichthyaetus*) - detected in 2021 and 2022.
- **Eurasian Curlew** (*Numenius arquata*) - detected annually from 2021-2023.
- *Chloropsis cyanopogon* - detected in 2022.

Least Concern (LC) but nationally protected: 24 species

- **Banded Linsang** (*Prionodon linsang*) - recorded in five locations during 2020 and 2021.
- **Lesser Oriental Chevrotain** (*Tragulus kanchil*) - detected every year with a high encounter frequency.
- **Bornean Treeshrew** (*Tupaia splendidula*) - detected in six different locations.
- **Purple-throated Sunbird** (*Aethopyga siparaja*) - consistently detected across multiple locations.
- **Common Hill Myna** (*Gracula religiosa*) - consistently detected each year.
- **Black Bittern** (*Ixobrychus flavicollis*) - detected in 2020 within the canal area.
- **Blue-crowned Hanging-parrot** (*Loriculus galgulus*) - detected at seven locations.
- **Pied Fantail** (*Rhipidura javanica*) - detected in nearly all monitoring locations.

	○ Crested Serpent Eagle (<i>Spilornis cheela</i>) - consistently detected each year. ○ Great Egret (<i>Ardea alba</i>) - observed in 2021 and 2022. ○ Gull-billed Tern (<i>Gelochelidon nilotica</i>) - detected along the coast. ○ White-bellied Sea-eagle (<i>Haliaeetus leucogaster</i>) - detected along the coast. ○ Brahminy Kite (<i>Haliastur indus</i>) - detected along the coast. ○ Black-headed Gull (<i>Larus ridibundus</i>) - detected in 2021 around the coastal area. ○ Black-thighed Falconet (<i>Microhierax fringillarius</i>) - detected in 2021 and 2022. ○ Whimbrel (<i>Numenius phaeopus</i>) - detected annually from 2021-2023. ○ Common Tern (<i>Sterna hirundo</i>) - detected annually from 2021-2023. ○ Oriental Pied Hornbill (<i>Anthracoceros albirostris</i>) - detected in multiple locations in 2022 and 2023. ○ Great-billed Heron (<i>Ardea sumatrana</i>) - detected in 2022 and 2023. ○ Jerdon's Baza (<i>Aviceda jerdoni</i>) - detected in 2022. ○ Sooty-headed Barbet (<i>Caloramphus fuliginosus</i>) - detected in 2022. ○ Kentish Plover (<i>Charadrius alexandrinus</i>) - detected in 2022. ○ Little Tern (<i>Sternula albifrons</i>) - detected in 2023 around the coastal area. ○ Greater Crested Tern (<i>Thalasseus bergii</i>) - detected in 2023 around the coastal area. Data Deficient (DD) but nationally protected: 1 species ○ Bornean Pigmy Squirrel (<i>Exilisciurus exilis</i>) - detected at only one location in 2020.
Areas needed for habitat connectivity	The Katingan Mentaya Project is a peatland forest restoration initiative aimed at protecting the remaining forest and restoring degraded areas, including rewetting drained peatlands, for the benefits of climate, community, and biodiversity. All activities—such as forest protection, replanting, rewetting, and community engagement—are expected to enhance habitat extent, integrity, and quality for native wildlife. Through these efforts, we anticipate that the project will result in significant net benefits for wildlife, including improvements in habitat connectivity. However, further monitoring and systematic biodiversity assessments will be needed to evaluate the long-term ecological impacts of rewetting and replanting during future monitoring periods. Compared to baseline scenarios, where the area could have been converted into a forestry monoculture plantation involving peatland drainage and land clearing, the project offers a much more favourable outcome for biodiversity conservation. A critical aspect of the project is its focus on conserving the remaining intact forest within the project area. This strategy will improve habitat connectivity across large blocks of undisturbed forest, supporting biodiversity across the entire project. Increased connectivity is expected to enhance the viability of wildlife populations, particularly for species that are

poor dispersers (Hatfield et al., 2008), and promote greater resilience to climate change by facilitating range shifts and migration (Senior et al., 2019). By allowing species to move and adapt, the project increases the likelihood of maintaining ecological function in the face of environmental stressors. Project activities are regularly evaluated and adjusted based on monitoring data to ensure that biodiversity, including wildlife habitat, is maintained and improved.

To date, no significant barriers to wildlife movement have been observed as a result of project activities, indicating that the strategies implemented so far have been successful in maintaining forest intactness and connectivity. This is crucial for ensuring that the project's long-term goals of climate change mitigation and biodiversity conservation are met.

The Katingan Mentaya Project's activities contribute directly to the Gold Level requirement for demonstrating climate change adaptation benefits by enhancing the adaptive capacity of biodiversity and supporting the resilience of the peatland ecosystem in the face of changing climatic conditions. Through peatland rewetting, continued forest protection, and restoration, the project aims to stabilise hydrological conditions and reduce vulnerability to fires and droughts - two of the most severe climate-related threats in Central Kalimantan. By maintaining more natural water flow and reducing peat subsidence, these actions are expected to help peat swamp ecosystems retain moisture and ecological function. Cooler and wetter microhabitats are likely to buffer temperature fluctuations and provide refugia for moisture-dependent species. Such conditions help moisture-dependent flora and fauna persist during extreme weather events, supporting the overall adaptive capacity of the landscape.

In addition, the project's protection of extensive, contiguous forest blocks helps maintain and enhance habitat connectivity, which is essential for supporting biodiversity resilience and adaptation. This connectivity enables species to move within the landscape, assess critical resources, and use a wider range of habitats as environmental conditions change (e.g., changing rainfall patterns, temperatures, and food availability). Species such as the Bornean Orangutan (*Pongo pygmaeus*), Proboscis Monkey (*Nasalis larvatus*), Sunda Clouded Leopard (*Neofelis diardi*), and several hornbill species will particularly benefit from this landscape-scale approach, as their survival depends on large, intact and connected habitats. By reducing fire risks, conserving genetic diversity, and maintaining ecosystem functions such as pollination and seed dispersal, the project supports a dynamic and self-sustaining ecological system that is better able to cope with future climatic pressures. Collectively, these interventions demonstrate that the project's actions not only mitigate climate change but also enhance the resilience and adaptive capacity of existing biodiversity under changing conditions – meeting the CCB Gold Level criteria for exceptional climate change adaptation benefits.

5.1.4 High Conservation Values Protected (CCB, B2.4)

The Katingan Mentaya Project supports environmental High Conservation Values (HCVs) 1, 2, 3, and 4, and is managed accordingly. The entire forested area of the project (136,729.44 ha as of 2020) qualifies as **HCV 1** due to the presence and support of populations of rare, threatened, and endangered (RTE) species. These include flora and fauna that are dependent on intact and high-quality peat swamp forest habitats—such as certain primates, trees, felids, freshwater fish, and wetland-dependent bird species. The project area also supports RTE species that are more tolerant of some forest disturbance, including ungulates and generalist primate and bird species.

The full extent of the forested area is also classified as **HCV 2**, as it contains one of the largest remaining intact and continuous areas of mixed peat swamp forest outside of protected areas in Indonesia. The project area forms a continuous corridor with Sebangau National Park to the east and contains natural transitions to other ecosystem types including freshwater swamp forest and heath forest. The area supports the full range of species representative of this habitat type at a regional level.

Peat forests in the project area are classified as **HCV 3** due to their status as rare and endangered ecosystems. Intact, un-drained peat swamp forests are one of the most threatened habitats in Indonesia, having faced significant degradation, with over 30% of these forests lost or severely damaged between 1995 and 2003 (Hooijer et al., 2006). In addition to the peat swamps, other ecosystems in the project area, such as freshwater swamp forest and seasonally flooded river plain forest, are also considered rare and under threat.

Finally, peat forest in the project area is also classified as **HCV 4** due to its critical role in providing ecosystem services that support both local communities and broader environmental stability. These peat forests are essential for regulating water flow, preventing floods, and maintaining water quality. The entire peatland area (149,800 ha) of Katingan Mentaya should be considered HCV 4 due to its critical ecosystem services, including water regulation, flood prevention, fire risk reduction, and its role in maintaining water quality and preventing soil erosion in the region. See the '**PDD HCV Assessment.docx**' file and the '**HCV Maps**' folder completed for the PDD for full details of the HCV areas within the project area.

Unfortunately, global threats such as habitat loss, fragmentation, fires, illegal logging, and the conversion of forests to plantations pose significant challenges to biodiversity in Southeast Asia, including in the Katingan Mentaya Project area. Additional pressures, including hunting, wildlife trade, disease, and climate change, further intensify these impacts. While small-scale illegal logging has been detected within the project area, the project team addresses these incidents

through adaptive management, demonstrating its commitment to protecting biodiversity-related HCVs within the project area, and the broader zone where possible. This commitment ensures that project activities do not negatively impact biodiversity. The following measures outline how threats to HCVs are reduced and biodiversity is actively monitored to ensure the project's goals are met:

1. Fire prevention activities

The team successfully detected and extinguished all fires in the buffer zones, ensuring that no fires occurred within the project area during this monitoring period. This significant achievement was the result of the collaborative efforts of the project team, local communities, and stakeholders, including government authorities committed to addressing fire-related challenges and protected HCV areas. Fire prevention was achieved by advanced techniques such as remote sensing using satellites and drones, ground patrols by the field team, as well as practical fire mitigation measures like establishing firebreaks, constructing wells, and other strategies (see **Climate section 3**).

2. Monitoring and deterring illegal activities:

Frequent routine patrols are conducted by RMU teams in close collaboration with local communities in the forest to ensure that illegal activities such as hunting and logging are promptly detected and addressed, minimising their impact on biodiversity. Evidence of these patrols, including dates and frequency, can be found in the '**Anthropogenic Threats: Patrols**' supporting evidence folders. Guard posts have also been established at strategic locations to deter unauthorised access, monitor entry points, and strengthen the physical presence of protection teams. In addition, any forest disturbances within and around the project area are tracked using near-time satellite imagery by the Permian team (see **Climate section 3.1.3** and **sections 5.1.2** and **5.1.3** for details of this analysis). If any forest disturbances are detected through the inspection and analysis of remotely-sensed satellite imagery, RMU field teams can be deployed to verify and respond to any illegal activities, if necessary.

While fires have been successfully prevented from entering the project area during the monitoring period, illegal logging remains a challenge. Unlike forest fires, which have become a high priority on the agendas of the government and most stakeholders, illegal logging and hunting are more subtle threats that generally receive relatively less attention, even from law enforcement agencies. These illegal activities are often driven by the demand for timber or protein at both local and regional levels. They sometimes involve closed networks of actors and, at times, include local elites. To address these threats, the project team employs various

approaches. The establishment of guard posts and the organisation of occasional patrols are among the preventive measures implemented to deter illegal activities and unauthorised entries. Additionally, the team works closely with local communities, involving them in programmes designed to reduce their participation in illegal or unsustainable livelihood activities (see **Community section 4**). When possible, the team investigates illegal activities to identify those involved and understand their roles or motivations—whether they are independent actors or individuals paid by others to carry out such activities. Based on this profiling, the team carefully formulates appropriate responses to effectively stop the illegal activities.

3. Biodiversity monitoring:

The Katingan Mentaya Project area is widely recognised as an ecologically significant habitat, particularly for species associated with peat swamp forests, which are highly specialised ecosystems that provide critical services to biodiversity. The project team continuously monitors the status of biodiversity within the project area, with a particular focus on RTE species (HCV 1). Among these, flagship species such as the Critically Endangered Bornean Orangutan (*Pongo pygmaeus*) and the Endangered Proboscis Monkey (*Nasalis larvatus*) are of particular importance, with the continued presence of these species being a key indicator of the overall health of the ecosystem.

Biodiversity monitoring has been conducted annually using camera trap and line transect surveys to collect data on vertebrate populations. See **section 5.3** and documents in the ‘**RTE Species**’ supporting information folder. This data helps to track the continued presence of RTE species within the project area. Furthermore, the orangutan population, a key trigger species for the project, is monitored separately every year through surveys to track population trends. Full details of the orangutan surveys can be found in the ‘**Flagship species: Orangutans**’ supporting evidence folders and a summary is provided in **section 5.3**. Alongside our monitoring activities, the project strictly adheres to conservation practices designed to protect biodiversity, including controlled access to forest/HCV areas (e.g., via security checkpoints and gates; see **section 5.3** for details). Harmful activities, such as logging and hunting, are prohibited within the project area.

Various methods were used to detect the presence of RTE species, including nest counts for orangutans, line transects for birds and mammals, camera trapping for ground-dwelling birds and mammals, targeted observations, citizen science using an internally developed mobile app, flora plots and exploration, and waterbird monitoring. These activities have been implemented directly by the dedicated RMU biodiversity team/project staff and in collaboration with external experts. Updates on global status’ have primarily referred to the IUCN Red List

(<https://www.iucnredlist.org/>). Please refer to **section 5.3** for more details on RTE species monitoring and the '**RTE Species**' and '**Flagship Species**' folders in the supporting evidence for the full methods and results of our monitoring.

4. Community engagement

Community engagement plays a vital role in ensuring the protection of HCVs within the project area. Through outreach, education programmes, and collaborative initiatives, the project actively works with local communities to reduce threats such as illegal logging and hunting. Key activities include the introduction of diverse livelihood options, such as agroforestry and ecotourism, which reduce dependency on unsustainable activities like hunting. These programmes empower communities economically while promoting conservation goals. Additionally, regular awareness campaigns highlight the ecological and economic benefits of protecting the forest and its biodiversity, fostering a sense of shared responsibility. The project also facilitates participatory monitoring, involving local communities in activities like patrolling and data collection. This collaboration not only enhances forest protection but also strengthens trust and partnerships between the Katingan Mentaya Project team and local stakeholders. For more detailed descriptions of these activities, refer to **Community section 4**.

5. Preserving an intact forest landscape

One of the main objectives of the Katingan Mentaya Project is to preserve the integrity of its remaining intact forest landscape (HCV 2), which is essential for supporting biodiversity and the long-term survival of RTE species. The measures outlined above focus on preventing deforestation and maintaining the continuity of forest ecosystems, ensuring that large, intact areas of forest remain unfragmented and resilient against external pressures such as climate change. Through consistent protection efforts, including the enforcement of boundaries and the mitigation of threats such as illegal logging, the project successfully maintains large blocks of intact forest. This helps to preserve crucial habitats for species such as orangutans, whose long-term survival depends on relatively large areas of forest habitat (Ancorenaz et al., 2021).

In addition to direct protection, the project also works to maintain habitat connectivity, particularly through the reforestation/restoration of degraded areas. The persistence of large blocks of intact forest is key to preserving wildlife habitat that facilitates species movement and gene flow, further promoting long-term ecological viability (Hatfield et al., 2008; Senior et al., 2009). Restoration efforts may also help buffer the forest from edge effects (e.g., see Murcia 1995), in time acting as barriers against the impacts of surrounding land use changes and ensuring habitat stability. Furthermore, to restore ecosystem functionality, the project focuses on

canal blocking and rewetting initiatives, which help restore degraded peatland areas, enhancing the ability of these ecosystems to store carbon, support biodiversity and prevent further land degradation (e.g., see Hooijer et al., 2024; Taufik et al., 2023)

Through ongoing monitoring, the project tracks the health and extent of these intact forest areas to ensure that they continue to maintain the ecosystem's functionality and support biodiversity. By combining forest protection, restoration efforts (including canal blocking and rewetting), and active community engagement, the Katingan Mentaya Project aims to preserve the integrity of the forest landscape, preventing fragmentation and supporting the survival of RTE species. This approach helps to safeguard the long-term ecological health of the forest, maintaining critical habitats and HCV areas, as well as ensuring the stability of the entire ecosystem.

5.1.5 Species Used (VCS, 3.19; CCB, B2.5, 2.6)

The project does not use non-native or invasive species, which aligns with best practices in environmental management. The project uses native tree species in its tree planting and replenishment activities. The use of native species ensures that the project aligns with ecological principles and supports local biodiversity. Native species are adapted to the local environment, reducing the risk of unintended ecological consequences. The project's approach reflects a commitment to ecological sustainability and the preservation of native ecosystems. The use of native species also supports the project's aim to enhance and protect the natural environment, ensuring the well-being of local ecosystems and the species that depend on them.

Table 5.1. List of species used for replanting and replenishing (note: all natives)

Local name	Latin name	Family	Classification	Justification for use	Adverse effects and mitigation
Jelutung Rawa	<i>Dyera polyphylla</i>	Apocynaceae	Native	Replanting	NA
Jambuan	<i>Syzygium sp</i>	Myrtaceae	Native	Replanting	NA
Bintan	<i>Parastemon urophyllus</i>	Chrysobalanaceae	Native	Replanting	NA
Belangeran	<i>Shorea balangeran</i>	Dipterocarpaceae	Native	Replanting	NA
Tabaras	<i>Stemonurus secundiflorus</i>	Stemonuraceae	Native	Replanting	NA
Lewang	<i>Planchonella maingayi</i>	Sapotaceae	Native	Replanting	NA

Meranti Bunga	<i>Shorea teysmanniana</i>	Dipterocarpaceae	Native	Replanting	NA
Katiau	<i>Madhuca mottleyana</i>	Sapotaceae	Native	Replanting	NA
Rambutan Hutan	<i>Nephelium lappaceum</i>	Sapindaceae	Native	Replanting	NA
Bintangur	<i>Calophyllum lanigerum</i>	Calophyllaceae	Native	Replanting	NA
Pulai Rawa	<i>Alstonia spatulata</i>	Apocynaceae	Native	Replanting	NA
Ehang	<i>Diospyros siamang</i>	Ebenaceae	Native	Replanting	NA
Parupuk	<i>Lophopetalum multinervium</i>	Celastraceae	Native	Replanting	NA
Papung	<i>Sandoricum beccarianum</i>	Meliaceae	Native	Replanting	NA
Terantang	<i>Camptosperma coriaceum</i>	Anacardiaceae	Native	Replanting	NA
Tumih	<i>Combretocarpus rotundatus</i>	Anisophylleaceae	Native	Replanting	NA
Nyatuh Gagag	<i>Palaquium cochlearifolium</i>	Sapotaceae	Native	Replanting	NA
Medang	<i>Litsea sp</i>	Lauraceae	Native	Replanting	NA
Karandau	<i>Knema intermedia</i>	Myristicaceae	Native	Replanting	NA
Tabunter	<i>Ternstroemia magnifica</i>	Theaceae	Native	Replanting	NA
Madang Perawas	<i>Litsea sp</i>	Lauraceae	Native	Replanting	NA
Pendu	<i>Sterculia gilva</i>	Malvaceae	Native	Replanting	NA
Gemor	<i>Nothaphoebe coriacea</i>	Lauraceae	Native	Replanting	NA
Galam	<i>Melaleuca leucadendra</i>	Myrtaceae	Native	Replanting	NA
Kacapuri	<i>Diospyros areolata</i>	Ebenaceae	Native	Replanting	NA
Hangkang	<i>Palaquium leiocarpum</i>	Sapotaceae	Native	Replanting	NA
Mangkinang	<i>Elaeocarpus griffithii</i>	Elaeocarpaceae	Native	Replanting	NA
Kapur Naga	<i>Calophyllum hosei</i>	Calophyllaceae	Native	Replanting	NA
Punak	<i>Tetramerista glabra</i>	Tetrameristaceae	Native	Replanting	NA
Pampaning	<i>Lithocarpus dasystachyus</i>	Fagaceae	Native	Replanting	NA
Kajalaki	<i>Aglaia rubiginosa</i>	Meliaceae	Native	Replanting	NA
Galam Tikus	<i>Syzygium sp</i>	Myrtaceae	Native	Replanting	NA

Mandarahan	<i>Horsfieldia crassifolia</i>	Myristicaceae	Native	Replanting	NA
Parupuk dalam Hutan	<i>Kokoona ovatolanceolata</i>	Celastraceae	Native	Replanting	NA
Tampohot	<i>Syzygium napiforme</i>	Myrtaceae	Native	Replanting	NA
Tatumbu	<i>Syzygium grande</i>	Myrtaceae	Native	Replanting	NA
Tampang	<i>Litsea sp</i>	Lauraceae	Native	Replanting	NA
Pupuh Pelanduk	<i>Neoscortechinia kingii</i>	Euphorbiaceae	Native	Replanting	NA
Manggis Hutan	<i>Garcinia bancana</i>	Apocynaceae	Native	Replanting	NA
Teras Nyating	<i>Gardenia griffithii</i>	Myrtaceae	Native	Replanting	NA
Gula-gula	<i>Litsea gracilipes</i>	Chrysobalanaceae	Native	Replanting	NA

5.1.6 Invasive Species (VCS, 3.19; CCB, B2.5)

The project has explicitly ensured that species used for rehabilitating degraded areas within the project area during this monitoring period are exclusively non-invasive and native to Central Kalimantan. This deliberate approach minimises any risk of introducing or promoting invasive species, aligning with ecological best practices. By prioritising native species, the project supports the restoration of the natural balance of the local ecosystem while preserving its biodiversity and ecological integrity. This commitment underscores the project's dedication to sustainable restoration and the long-term health of Central Kalimantan's unique environment.

Existing invasive species	Mitigation measures to prevent the spread or continued existence of invasive species
NA	NA

5.1.7 GMO Exclusion (CCB, B2.7)

No genetically modified organisms were used by the project.

5.1.8 Inputs Justification (VCS, 3.19; CCB, B2.8)

The fertilisers, chemical pesticides, biological control agents, and other inputs utilised by the project, along with their potential adverse effects, are summarised in the table below.

Name	<i>Identify input</i> Organic Fertiliser (e.g., mulch, compost, concentrate)
Justification of Use	<i>Justify use</i> Used to support small-scale agricultural crop development within existing community agricultural areas of the project zone, with methods, hence the name of the programme, known as “No Burning & No Chemical” (Tanpa Bakar Tanpa Kimia, TBTK). This was implemented in ~780 ha that benefit ~800 local communities in the project zone.
Adverse Effect	<i>Describe the potential and realized adverse effects on the region's environment and/or communities</i> None anticipated. This activity is confined to existing agricultural areas and aligns with established practices by local communities. Expected effects are overwhelmingly positive, as the adoption of organic fertilisers instead of chemical ones encourages the abandonment of stubble burning, a practice that frequently results in wildfires. Additionally, this shift enhances livelihoods by lowering input costs and further reduces environmental pollution and associated health risks.

5.2 Offsite Biodiversity Impacts

5.2.1 Negative Offsite Biodiversity Impacts (CCB, B3.1) and Mitigation Actions (CCB, B3.2)

All project activities have been designed to deliver positive biodiversity impacts. These include patrols to prevent illegal activities and fires, hunting surveys to determine hunting pressures, biodiversity monitoring to determine population trends and continued presence of key species, as well as rewetting and replanting activities. As such, no direct offsite biodiversity impacts are anticipated, and no mitigation measures are therefore required. However, whilst unlikely, there may be some ‘leakage’ effects brought about by project, which we have addressed in the table below.

Negative Offsite Impact	Mitigation Measure(s)
<i>Identify the negative impact on biodiversity.</i>	<i>Describe the actions taken to mitigate negative impact.</i>

Displacement of hunting activities	We recognise the potential for hunting activities to be displaced outside the project area as a result of increased protection efforts within its boundaries. To mitigate this negative impact, the project has implemented a combination of community engagement, alternative livelihood programmes and monitoring measures, which aim to reduce the number of community members hunting both within and outside of the project area/zone. These include: <u>Community engagement:</u> Working closely with local communities to promote sustainable practices and raise awareness about biodiversity conservation, which includes integrating environmental education in school curricula (see Community section 4). <u>Alternative livelihoods:</u> Providing economic alternatives such as community-based forestry, small-scale farming, or ecotourism to reduce reliance on illegal activities for income or sustenance (see Community section 4). <u>Hunting surveys:</u> Conducting regular surveys with communities to address the threat of hunting and determine whether the number of hunters within and outside of the project area has increased. From our previous monitoring, it does not appear that the number of hunters (i.e., from the communities interviewed) outside of the project zone has increased since 2016 (see section 5.3 and 'Hunting MR full report 2020-2023.docx' in the 'Anthropogenic Threats: Hunting' supporting evidence folders. These measures aim to reduce displacement-driven hunting pressures and ensure the protection of biodiversity in the broader landscape.
Displacement of illegal logging activities	We recognise the potential for illegal logging activities to be displaced outside the project area due to enhanced protection efforts within its boundaries. To mitigate this risk, the project has again implemented a combination of community engagement activities and alternative livelihood programmes, which aims to reduce the number of community members participating in illegal logging activities both within and outside of the project area/zone; see above and Community section 4 for more details.

5.2.2 Net Offsite Biodiversity Benefits (VCS, 3.19; CCB, B3.3)

Evaluation of negative impacts on biodiversity outside the project zone:

All project activities have been designed to deliver positive biodiversity impacts. Consequently, no negative impacts are anticipated either on-site or off-site. However, the possibility exists that forest protection within the project area could lead to displacement of activities (leakage) off-site, potentially impacting biodiversity in those areas. Such impacts will be closely monitored, and any detected effects will be quantified (see **section 3.2.3** and **section 5.4**). As outlined in **section 5.2.2**, no major off-site negative impacts are currently anticipated, so no mitigation strategy is necessary at this time. Nevertheless, if our monitoring identifies any such impacts, immediate remedial actions will be implemented.

While hunting activities are practiced by communities within the project area, they are not thought to be a primary source of subsistence for the majority of community members (see **Community section 3**). Hence, the principal threats to biodiversity in the absence of the project are land clearance for acacia plantations and forest degradation from selective logging, which are mitigated by the project's implementation (with the exception of a relatively small amount of illegal logging activities). These avoided threats significantly enhance the biodiversity value of the landscape compared to the without-project scenario. There are also a number of offsite biodiversity benefits that outweigh the potentially negative impacts of leakage effects in relation to illegal hunting and logging activities, some of which are detailed below.

The project's biodiversity benefits outside the project area/zone

Connectivity and ecosystem integrity: The project plays a vital role in maintaining and enhancing habitat connectivity within the landscape. The protection of the project area ensures the preservation of a large forest area that, while separated by rivers, still connects with adjacent protected areas, such as the nearby Sebangau National Park. This connectivity is essential for the movement of wide-ranging species across the landscape and contributes to the maintenance of genetic diversity, which is crucial for the long-term resilience of ecosystems and species populations. These efforts further strengthen the project's positive biodiversity impact.

Boosting species populations in the landscape: In particular, species reliant on intact peat swamp forests, an ecosystem that is underrepresented in global conservation efforts, benefit significantly from the project's protection and restoration measures. By safeguarding these critical habitats, the project not only supports the survival of these species but also facilitates their population growth, contributing to a broader boost in biodiversity across the surrounding landscape.

Given these considerations, the net effect of the project on biodiversity is overwhelmingly positive. The avoided deforestation, maintenance of ecosystem connectivity, and protection of

critical habitats far outweigh any potential displacement impacts. This ensures that the project delivers substantial and measurable biodiversity benefits while addressing potential risks through ongoing monitoring and adaptive management.

The project's biodiversity benefits within the project area/zone

The project has implemented several measures to directly enhance biodiversity within the project area, and these benefits are outlined below:

Habitat protection and regeneration: Prior to the start of the Katingan Mentaya Project, lowland forests in this area, like much of Kalimantan, underwent extensive logging, both legal and illegal. Without the project intervention, these forests would have been lost following conversion into industrial plantations, typically planted with fast-growing monocultures like acacia. The project has implemented a multi-pronged approach, including forest protection measures and active restoration initiatives. Degraded areas are being restored through strategic replanting of native species and the crucial rewetting of peatlands. These combined efforts are thought to have facilitated natural forest regeneration, leading to an overall increase in above-and-below ground biomass over time. This enhanced forest health not only benefits climate change mitigation by sequestering carbon but also supports biodiversity conservation and improves the overall well-being of local communities who rely on healthy ecosystems for their livelihoods.

By blocking drainage canals, the project aims to reintroduce water into dried peatlands, preventing peat from oxidising and releasing carbon dioxide. This rewetting helps restore the natural water balance of the ecosystem. Part of these initiatives are to create water retention ponds. These ponds keep the forest wet and reduce the risk of fires, which are a major threat in drained peatlands. Local communities are involved in these rewetting projects, ensuring that rewetting and conservation efforts are sustainable and meet the needs of residents. A recent proposal sets out the proposed rewetting plan for the project area; the report outlines which canals need to be blocked and which ones need to be prioritised, what the proposed methods are and also the anticipated costs of undertaking this work. See the **Rewetting plan** in the supporting evidence 'Forest Extent and Quality: Rewetting' supporting information folders for full details. In addition, the project also undertakes significant replanting activities to restore degraded areas. Between 2010 and 2020 over 1895.8 ha have been replanted and a further 1750 ha were replanted between 2021 to 2023, which corresponded to over 210,892 seedlings planted by the team. See the 'Replanting Plan 2024-2033.xls' file in the 'Forest Extent and Quality: Replanting' supporting information folders.

Persistent populations of trigger species: As a result of forest protection and regeneration, our monitoring results suggest that the population of key trigger species, the Bornean Orangutan (*Pongo pygmaeus*), are thought to have remained relatively stable since the last monitoring period (i.e., no dramatic population crashes) (see **sections 5.3, 5.4** and the '**Orangutans MR full report 2020-2023.docx**' report in the '**Flagship Species: Orangutans**' supporting evidence folders for further details). This stability can be attributed to project implementation and the prevention of habitat conversion to mosaic plantings.

Continued presence of many RTE species: The camera trap and line transect monitoring conducted by the field team during 2020-2023 have documented the continued presence of many RTE species within the project area (see **section 5.3**). The protection of the forest within the project area, combined with a reduction in hunting activities, means that the project area likely serves as a refuge for many RTE species, thus contributing to their population recovery. This is particularly the case for species that are severely hunted elsewhere, such as the Sunda Pangolin (*Manis javanica*) and Helmeted Hornbill (*Rhinoplax vigil*) (both CR).

Maintaining forest intactness: Over the course of the monitoring period, there has been 461.8 ha of deforestation, caused by illegal logging activities. However, this represents a loss of only ~0.3% of the total 149,800 ha project area. While small-scale deforestation and illegal logging have caused varying degrees of degradation in some areas, the overall ecosystem remains largely intact, supporting its critical role in biodiversity conservation. These results highlight the effectiveness of ongoing conservation measures in mitigating habitat loss and preserving vital ecosystems. The project takes all instances of deforestation and degradation extremely seriously, implementing targeted interventions to address these threats and further strengthen the protection of this vital habitat.

Maintained relatively low level of hunting: Since our last monitoring report, the project has conducted an additional three hunting surveys. During this time, we have improved the survey methodology by covering more villages and conducting the surveys more intensively. We believe these efforts will enhance confidence in the accuracy of the data. Overall, the annual offtake of species from our targeted species groups has dropped steeply after the 2016 community interviews and has since fluctuated over time. Several factors that may have influenced this change in hunting behaviour since the surveys began. First, patrolling activities within the project zone have increased since 2016, with additional measures, such as the installation of signposts, implemented after 2018. These enhanced protection efforts have likely made access to the project area more challenging, contributing to the observed decline in species offtake. This could

also be attributed to community engagement efforts by the RMU team, which have raised awareness about offered alternative livelihoods, reducing reliance on forest resources (see **Community section 4**). For full details of the hunting surveys see **section 5.3** and ‘**Hunting MR full report 2020-2023.docx**’ in the ‘**Anthropogenic Threats: Hunting**’ supporting evidence folders.

The evaluation of the project’s impact on biodiversity shows a positive effect, as all activities are designed specifically to enhance biodiversity within the project area and its surrounding zone. While we acknowledge the possibility that hunting and logging activities may be redirected to other forest areas, the overall net biodiversity benefits within the project area remain positive.

5.3 Biodiversity Impact Monitoring

5.3.1 Biodiversity Monitoring Plan (CCB, B4.1, B4.2, GL1.4, GL3.4)

Below, we provide a summary of all our biodiversity monitoring activities, for full methods and results please refer to detailed supplementary reports in the supporting information.

Forest extent and quality

Forest extent:

Background: The Katingan Mentaya Project spans a peat swamp forest area critical for biodiversity conservation, carbon sequestration, and ecosystem services. Monitoring forest extent is vital for assessing the effectiveness of conservation efforts and detecting changes due to natural or anthropogenic factors.

Methods: Please refer to **Climate section 3.1** for detailed methods used to calculate forest extent during the monitoring period. These methods involve the use of high-resolution satellite imagery and spatial analysis to quantify changes in forest cover within the project area. The project annual forest extent used for the biodiversity population densities has been derived from the annual land cover classifications (see **Climate section 3.1.3.3.1** Annual land cover change and deforestation monitoring).

Results: The total forest extent within the project area was 136,729.44 ha in 2020. By 2023, this figure had decreased slightly to 136,227.39 ha, reflecting a net loss of 502.05 ha over the monitoring period. This reduction represents approximately 0.37% of the total 149,800-ha project area.

Explanation: Between 2020 and 2023, the observed reduction in forest extent is attributed primarily to illegal logging and small-scale disturbances. Despite this loss, the overall forest ecosystem remains largely intact, reflecting the effectiveness of the project's protective measures in maintaining the forest's critical ecological functions. Ongoing efforts to mitigate deforestation and promote natural regeneration are expected to support the recovery and expansion of high-quality forest habitats over time.

Forest quality:

Background: Vegetation quality (also termed 'health') was identified as a key biodiversity variable because anthropogenic disturbances, such as the removal of large trees via logging, can significantly alter forest quality and structure. Such disturbances can lead to a decline in both the abundance and diversity of forest species, especially for those with restricted ranges, such as endemics (e.g., Morris, 2010). We use aboveground biomass as a proxy for vegetation quality and provide a justification in **section 5.1.1** as to why this metric is a reasonable indicator of vegetation (or forest) quality in logged forest settings.

Methods: Annual aboveground biomass growth rates were calculated during the monitoring period using LiDAR-based Chloris Above-Ground-Biomass (AGB) data. These annual growth rates were then averaged to give an overall net growth rate.

Results: The data shows that there has been a relatively consistent aboveground biomass growth rates during the 2020-2023 period. Whilst there has been some degradation (**Figure 5.1**, middle panel) there has been substantial growth (**Figure 5.1**, right panel), resulting in an overall net growth of 0.5 tC/ha/yr (**Figure 5.1**, left panel).

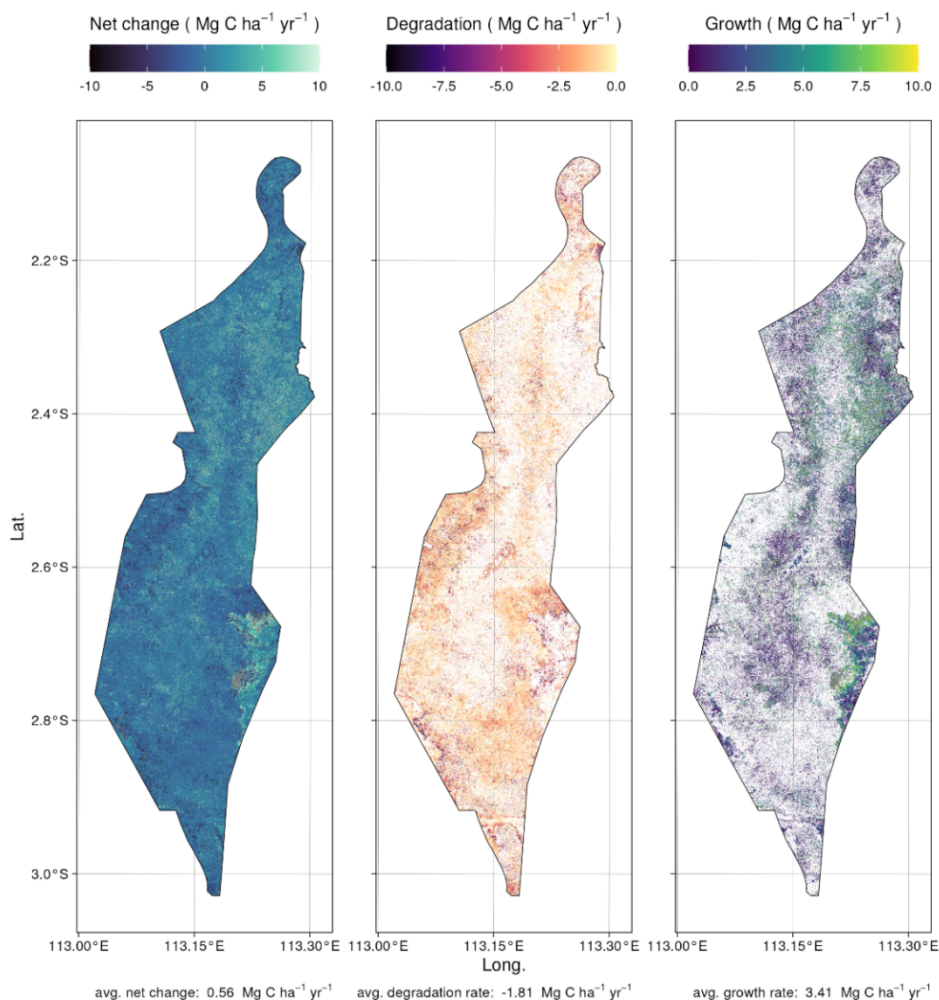


Figure 5.1. Net change, degradation and growth of aboveground biomass (Mg C ha⁻¹ yr⁻¹) during the 2020-2023 monitoring period. These maps were created using LiDAR-based Chloris Above-Ground-Biomass (AGB) data.

Explanation: The reported increase in aboveground biomass is a result of natural forest regeneration following the protection of the project area in 2010. Despite the relatively small amount of deforestation (461.8 ha) driven by illegal logging activities during the monitoring period and the absence of significant fire damage, there has been an overall increase in forest quality in some areas, as evidenced by the rise in aboveground biomass from 2020 to 2023. Higher quality forests, i.e., habitats that are ecologically more similar to old-growth ('primary') forests, have been found to support more disturbance-sensitive species compared to degraded habitats (Dumbrell & Hill, 2005; Peh et al., 2005). While full recovery or regeneration of forest

habitats can take many years, depending on the severity of initial degradation, these results represent a positive step toward that goal. Forest regeneration in the most degraded areas of the Katingan Mentaya Project will provide more suitable, high-quality habitats for forest-dependent and disturbance-sensitive species. Trends in aboveground biomass and biodiversity will be closely monitored over time to identify any potential relationships.

Flagship species

Orangutan monitoring:

Orangutan population data were collected by the RMU field team, for full details of the orangutan methods and results see ‘Orangutans MR full report 2020-2023.docx’ report in the ‘Flagship Species: Orangutans’ supporting evidence folders. Summarised orangutan analyses are also provided in the ‘Data Summary Orangutan 2020-2023 for MR.xls’ file within the ‘Flagship Species: Orangutans’ folders.

Background: The Bornean Orangutan (*Pongo pygmaeus*) is currently listed as Critically Endangered by the IUCN Red List across Borneo and is the project’s key trigger species. To better understand the pressures facing the Bornean Orangutan in the project area, it is essential to consider the complex factors influencing their population dynamics and behaviour. Orangutan populations across Borneo are shaped by both local and landscape-scale factors (e.g., Ancrenaz et al., 2014; Marchant et al., 2014; pers. comms. Dr Felicity Oram), including habitat type and quality (Davies et al., 2017), changes in forest connectivity and composition (Ancrenaz et al., 2021), forest fires (Ashbury et al., 2021), and hunting pressure (Ancrenaz et al., 2024). Individual variations in behaviour, such as movement patterns, nest-building habits, and sensitivity to disturbances, also contribute to fluctuations in population dynamics and nest counts at specific sites. Responses to disturbances are often complex, with changes in population density that are gradual and context-dependent rather than immediate.

The orangutan population in the project area is considered largely closed, with limited or no dispersal due to natural and anthropogenic barriers. These include the Katingan River to the east, the Mentaya River to the west, mining activities to the north, and the coast to the south. It is estimated that the project area supports ~5% of the global population of Bornean orangutans. Monitoring data from 2002 to 2020 suggest that while population fluctuations have occurred, no significant changes in the number of individuals have been observed, as indicated by the 95% confidence intervals. See ‘Orangutans MR Full Report 2020-2023.docx’ file for orangutan population estimates between 2010-2020.

Methods: Between 2020 and 2023, twelve sampling sites were located across six different sub-watersheds and surveyed over multiple years (**Figure 5.2**; also see '**Orangutans MR Full Report 2020-2023.docx**' in the supporting information for sampling frequency). The watersheds, delineated by the main rivers (Katingan and Mentaya), serve as natural boundaries dividing the regencies, while the sub-watershed divisions are independent of administrative borders. Each sub-watershed is thought to possess unique biophysical characteristics and is subject to varying external pressures.

Orangutan monitoring was conducted by walking four 2 km line transects at each site. Data were collected by a primary trained observer who recorded observations on a datasheet, with support from a second team member. The orangutan monitoring team was often accompanied by the bird survey team, who occasionally assisted with nest observations. Along each transect, the orangutan nest observer recorded the location of every nest that was visible. In order to estimate nest density, the observer's position on the transect when the nest was spotted was also noted, as well as the angle of the nest relative to the transect orientation and the distance from the observer.

Orangutan densities for data collected after 2017 were estimated using DISTANCE 6.2 (Thomas et al., 2010) to model nest observations. Inputs included transect location, ID, length, nest counts, and perpendicular distances from nests to transects, along with parameters for nest production (r), nest decay time (t), and the proportion of nest builders (p). Full details of the modelling techniques and subsequent analyses are provided in the '**Orangutans MR Full Report 2020-2023.docx**' file.

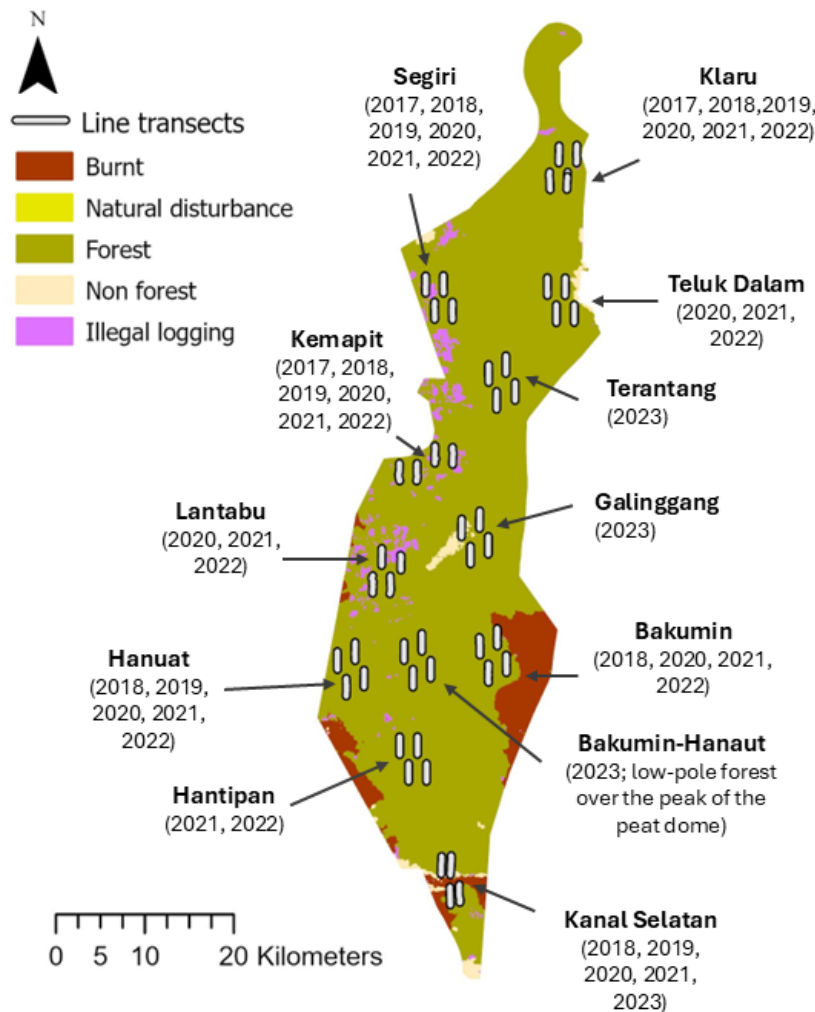


Figure 5.2. Map of 2 km line transects surveyed by the RMU team during 2020 to 2023. The legend shows the landcover data from the project area for 2023 (see Climate section 3.1.3.3.1) and shows areas of disturbance by illegal logging (pink shading).

Results: During the current monitoring period, overall orangutan density ranged from 1.95 (95% CIs = 1.38, 2.76) in 2020 to 1.23 (95% CIs = 0.92, 1.65) in 2022, showing fluctuations in the overall population, but no statistically significant change over these years, as indicated by overlapping 95% confidence intervals. These orangutan density estimates corresponded to an estimated population of 2,662 (95% CIs: 1881-3768) individuals within 136,729.44 ha of remaining forest in the project area in 2020 and 1,678 (95% CIs: 1253-2249) within 136,374.06 ha of forest in 2022. This was slightly lower than at the start of the last monitoring period, where

density estimates ranged from 3,101 (95% CIs: 2086-4611) in 2018. In 2023, only four sites were surveyed during this year (Bakumin-Hanaut, Galinggang, Kanal Selatan and Terantang), three of which were new sites selected for having 'low-pole' (tree) density, resulting in an overall orangutan density of 0.34 (CIs = 0.16, 0.74). The low orangutan density observed for 2023 is primarily due to the inclusion of three new sites, which were selected specifically for their lower-density characteristics. Thus, these figures should not be used to compare with previous estimates.

Evaluation: Our monitoring results indicate that orangutan density within the project area has fluctuated since surveys began in 2002, with density estimates ranging from 1.5 individuals per km² in 2002 to 1.23 individuals per km² in 2022. The overlapping confidence intervals from these years suggest that the changes in population density are not statistically significant, pointing to relative stability within the context of natural population fluctuations. However, variations in survey effort and changes in sampling site locations over time limit robust comparisons both across years and between monitoring periods. While a substantial and important population of orangutans remains within the project area, the density observed at the end of this monitoring period (1.23 individuals per km² in 2022) was lower than that recorded at the start of the previous monitoring period (2.26 individuals per km² in 2018). Additionally, there was also modest decrease in density over the current monitoring period where the density at the start of the monitoring period in 2020 was 1.95 individuals per km². Although this timeframe is too brief to establish a definitive trend in such a long-lived species, the observed decline may result from various factors, such as habitat quality, disturbances, or changes in survey methodology. Future monitoring will aim to refine data collection methods, improve consistency in sampling locations, and address potential threats. Recommendations for these efforts are outlined below to ensure accurate tracking and informed conservation actions.

To enhance our understanding of the orangutan population and the threats they face within the project area, we plan to conduct more comprehensive analyses as we gather a longer time series of standardised data. These analyses will investigate the effects of surrounding forest cover, local habitat characteristics, small-scale disturbances, and various human activities on orangutan populations. Should human activities, such as forest management practices, infrastructure development, noise, or visitor access, be found to negatively affect orangutans, we will prioritise the development of targeted mitigation strategies to address these impacts effectively.

RTE species

During this monitoring period, 49 threatened (i.e., CR, EN and VU) fauna species were recorded through our monitoring activities (e.g., line transects, camera traps and freshwater fish surveys), as well as from incidental encounters. This included two CR species (Bornean Orangutan and Sunda Pangolin), 19 EN species and 28 VU fauna species. In addition, 46 species listed on CITES appendices I or II were recorded, along with 62 nationally protected species and 23 Borneo endemics. This corresponded to 106 RTE species detected in total during the monitoring period; see the '**KMP Proposed RTE_HCV Species List & Status for MR 2020-2023.xlsx**' file for details. Details of the monitoring methods are outlined below.

Line transects:

*Line transect data were collected by the RMU field team, for full details of the line transect methods and results see '**Line transects MR full report 2020-2023.docx**' report in the '**RTE species – Line transects**' supporting evidence folders. Summarised line transect analyses are also provided in the '**Line Transect Data Analysis 2020-2023.xls**' file within the '**RTE Species: Line Transect**' folders.*

Background: Line transects are used to monitor wildlife presence and activity within the project area, providing valuable information about species that inhabit the area. Such surveys can be used to monitor primates and other diurnal mammals, as well as ground-dwelling, understory and canopy birds. These surveys help the project team better understand population trends, habitat use, and potential threats, such as hunting or habitat disturbance to RTE species. The data gathered through line transects supports ongoing conservation efforts and helps inform strategies to protect the unique biodiversity within the project area.

Methods: Line transect surveys were conducted by the RMU team in conjunction with orangutan nest observations (see **Figure 5.2**). As described in the orangutan population monitoring, line transects were established by the Katingan Mentaya Project team in several locations (sampling blocks) to represent different habitats across the project area. Unlike orangutan nest counts, which have been conducted since 2010, line transect surveys for birds and mammals were initiated by the RMU team in 2017. In that year, surveys were carried out at three locations: Klaru, Kemapit, and Segiri. In subsequent years (2018 and 2019), surveys were conducted at additional sites. Hence, The annual survey effort varied and generally increased from 2017 to 2019, followed by fluctuations in subsequent years (**Tables 5.2. and 5.3**). Since 2017, the most extensive survey effort occurred in 2021, covering 72 km. The total survey effort by the Katingan Mentaya Project team across 2017 to 2023, measured by transect length, was 323 km.

Due to the limited temporal data, we only qualitatively present the number of species observed along the line transects for each year in this report and summarise those found within the current monitoring period. Five diversity indices (Margalef's Index, Shannon Diversity Index, Dominance Index, Simpson's Index and Evenness Index) were also calculated through time and qualitatively compared in the '**Line transects MR full report 2020-2023.docx**' file. Species were identified by the RMU team using field guides by Payne et al. 2000 (mammals), Phillips and Phillips (2018) (mammals), Eaton et al. 2022 (birds), and MacKinnon and Phillipps (1993) (birds).

Results: Since 2017, annual species counts recorded on line transects have ranged from 65 to 90, with birds comprising the majority of detections. Mammal species counts have remained consistently low, typically ranging between 5 and 9 species per year. The annual counts of RTE species varied from 19 to 26. However, both the raw species and counts and the five chosen diversity indices indicate a slight declining trend over time, despite increased sampling effort. However, further analysis is required to account for differences in sampling effort and coverage across these years. See the document titled '**Line Transects MR Full Report 2020–2023.docx.**' for the full breakdown of results.

During the current monitoring period, 65 species were recorded in 2020 across a total transect distance of 56 km. In 2021, this increased to 74 species over 72 km, followed by 68 species in 2022 over 64 km. By contrast, only 38 species were recorded in 2023, reflecting the reduced survey effort of just 8 km at one site (**Table 5.3**). The corresponding counts of RTE species across these years were 20 in 2020, 19 in 2021, 23 in 2022, and 9 in 2023, respectively.

Table 5.2. List of the transect locations (sampling blocks) surveyed from year to year (a ✓ indicates that a survey was conducted in that location; see Figure 5.2 for map of line transect locations.

Locations	2017	2018	2019	2020	2021	2022	2023
Klaru (KI)	✓	✓	✓	✓	✓	✓	
Kemapit (Ke)	✓	✓	✓	✓	✓	✓	
Lantabu (La)				✓	✓	✓	
Hanaut (Ha)		✓	✓	✓	✓	✓	
Kanal Selatan (KS)	✓		✓	✓	✓		✓
Segiri (Se)	✓		✓	✓	✓	✓	

Bakumin (Ba)		✓	✓	✓	✓	✓	
Teluk Dalam (TD)					✓	✓	
Hantipan					✓	✓	

Evaluation: Overall, a substantial number of species were recorded during our line transect sampling, including a relatively high number of RTE species. These findings underscore the importance of the Katingan Mentaya Project in protecting species of conservation concern. While there is some indication of a decline in species detections and RTE counts over time, further analyses are needed to fully understand whether this reflects ecological changes or is influenced by variations in sampling effort. We do not quantitatively compare our survey results over time, as more advanced analyses are required to account for variables such as sampling site location, the number of sampling sites, surveyor identity, and seasonality. In the future, we aim to conduct more detailed analyses to examine species richness and diversity along the transects once a longer time series of data has been collected. These analyses will help determine whether observed patterns or changes in species numbers are due to sampling effects or reflect ecological trends. Nevertheless, our results confirm the continued presence of many species of conservation concern, this includes Greater Green Leafbird (*Chloropsis sonnerati*; EN), Storms Stork (*Ciconia Stormi*; EN), Southeast Asian Box Turtle (*Cuora amboinensis*; EN), Bornean White-bearded Gibbon (*Hylobates albibarbis*; EN), Southern Pig-tailed Macaque (*Macaca nemestrina*; EN), Bornean Orangutan (*Pongo pygmaeus*; CR) and Wrinkled Hornbill (*Rhabdotorrhinus corrugatus*; EN). These results highlight the exceptional biodiversity value of the project area.

Table 5.3. Line transect summary across years. Note that the length of the transects is 2 km, hence the total effort at each location is 8 km.

	2017		2018		2019		2020		2021		2022		2023	
	No. species	No. transects	No. species	No. transects	No. species	No. transects	No. species	No. transects	No. species	No. transects	No. species	No. transects	No. species	No. transects
Klaru	40	4	35	4	30	4	28	4	22	4	22	4	NA	NA
Kemapit	41	4	43	4	45	4	28	4	34	4	29	4	NA	NA
Lantabu	NA	NA	NA	NA	NA	NA	20	4	28	4	32	4	NA	NA
Hanaut	NA	NA	47	4	18	4	34	4	26	4	40	4	NA	NA
Kanal Selatan	40	4	NA	NA	36	4	29	4	25	4	NA	NA	38	4
Segiri	28	4	NA	NA	24	4	20	4	21	4	25	4	NA	NA
Bakumin	NA	NA	40	4	33	4	21	4	35	4	36	4	NA	NA
Teluk Dalam	NA	NA	NA	NA	NA	NA	NA	NA	32	4	19	4	NA	NA
Hantipan	NA	NA	NA	NA	NA	NA	NA	NA	39	4	45	4	NA	NA
Total 2 km transects	82	16	90	16	85	24	65	28	74	36	68	32	38	4

Camera trapping:

*Camera trap data were collected by the RMU field team, for full details of the camera trapping methods and results see ‘**Camera trapping MR full report 2020-2023.docx**’ report in the ‘**RTE species – Camera trapping**’ supporting evidence folders. Summarised camera trap analyses are also provided in the ‘**Bio Camera trap Informasi Temuan (Species).xls**’ file within the ‘**RTE Species: Camera Trapping**’ folders.*

Background: Camera trapping has been implemented as one of the primary methods for biodiversity monitoring in the project area. This technique, when applied with a standardised sampling design and robust analysis methods, has proven highly effective for monitoring a wide range of species, particularly ground-dwelling birds and mammals (Sunarto et al., 2013, Wearn & Glover-Kapfer, 2017), which constitute many of the RTE species targeted by the project. Camera traps are particularly well-suited for detecting rare and elusive animals, traits often associated with RTE species. By employing a well-documented and systematic sampling design, results can be compared across time and sites, allowing for robust monitoring and reliable inferences about the status and trends of target wildlife populations.

The primary objective of camera trapping in the project area is to address knowledge gaps regarding the use of the project area by RTE species, and to document their continued presence over time. The expected outputs of camera trapping include records of species presence across the sampled area, encounter or trap success rates, and where possible (i.e., where enough data have been collected) spatial distribution maps of target species. These data are critical for informing conservation strategies and tracking the effectiveness of management interventions.

Methods: When surveying an entire area or detecting all species is not feasible, careful sampling design can maximise the efficacy and efficiency of limited resources. The camera trap sampling design in the project area was developed to balance available resources and logistical constraints while ensuring comprehensive survey coverage, whereby the primary objective is to detect as many target species and individuals as possible across a diverse range of locations.

Between February 20th, 2020, and November 26th, 2023, camera traps were deployed across six ~8,000 ha (80 km²) sampling blocks within the project area. In each block, 20 camera traps were systematically placed in 2x2 km grid cells, with one trap per 1x1 km sub-cell, typically mounted 50 cm above the ground on trees or poles. Each camera operated for approximately three months before being relocated within the same or a different sampling block for the next session. When resampling within the same block, cameras were moved to different 1x1 km sub-

cell within the 2x2 km grids. In total, 571 1x1 km sub-grid cells were sampled. (see '**Camera trapping MR full report 2020-2023.docx**' report for full methodological details and sampling design).

Results: During this monitoring period, we identified 75 species via our camera trap sampling. These include, two Critically Endangered (CR) species, eight Endangered (EN) species, 10 Vulnerable (VU) species and five species that are endemic to Borneo. The most frequent species recorded were the Plantain Squirrel (*Callosciurus notatus*; 20 independent events per 1,000 trap days; 49% of locations), Southern Pig-tailed Macaque (*Macaca nemestrina*; 12/1000 trap days; 40% of locations), Sun Bear (*Helarctos malayanus*; 11/1000 trap days; 48% of locations), Bearded Pig (*Sus barbatus*; 9/1000 trap days; 35% of locations) and Bornean Orangutan (*Pongo pygmaeus*; 6/1000 trap days; 24% of locations). Other notable records included Sunda Clouded Leopard (*Neofelis diardi*, 0.1/1000 trap days; 1% of locations), Sunda Pangolin (*Manis javanica*, 1/1000 trap days; 8% of locations), Hairy-nosed Otter (*Lutra sumatrana*, 0.03/1000 trap days; 0.3% of locations), Yellow-throated Marten (*Martes flavigula*, 3 /1000 trap days; 18% of locations), Bornean Yellow Muntjac (*Muntiacus atherodes*, 0.9/1000 trap days; 3% of locations), Marbled Cat (*Pardofelis marmorata*, 2/1000 trap days; 10% of locations), Leopard Cat (*Prionailurus bengalensis*, 2/1000 trap days; 13% of locations), *Banded Linsang* (*Prionodon linsang*, 0.8/1000 trap days; 7% of locations) and Bornean Crestless Fireback (*Lophura pyronota*; 0.2/1000 trap days; 1% of locations).

All but one species listed as CR, EN or VU on the IUCN Red List during the last 2018-2019 monitoring period was confirmed during this period, highlighting the continued presence of species of conservation concern. There also appeared to be no major changes in encounter rates for CR, EN and VU species found between monitoring periods. The encounter rates for Sunda Pangolin increased from 0.5/1000 to 1/1000 trap days between MR periods, whilst those for Bornean Orangutan were 7/1000 trap days during the last MR period and 6/1000 during this monitoring period. However, the percentage of locations that orangutans were recorded at dropped by almost half (from 41% to 24%) between the previous and current monitoring periods.

In addition, a number of RTE species were recorded on the camera trap surveys in this monitoring period that were not found during the camera trap surveys in the previous period (2018-2019). These include, Asian Small-clawed Otter (*Aonyx cinerea*, 0.27/1000 trap days; 0.61% of locations), Flat Headed Cat (*Prionailurus planiceps*, 0.1/1000 trap days; 0.9% of locations), Black Hornbill (*Anthracoceros malayanus*, 0.01/1000 trap days; 0.9% of locations), Binturong (*Arctictis*

binturong, 0.03/1000 trap days; 0.3% locations), Bornean White-bearded Gibbon (*Hylobates albibarbis*, 0.03/1000 trap days; 0.3% locations), Proboscis Monkey (*Nasalis larvatus*, 0.03/1000 trap days; 0.3% locations) and Whiskered Flying Squirrel (*Petinomys genibarbis*, 0.03/1000 trap days; 0.3% locations).

Evaluation: From 2020 to 2023, extensive camera trapping across six sampling blocks in the project area has provided critical data for biodiversity monitoring, particularly for RTE species. This effort has yielded valuable insights into species presence, encounter rates, and distribution, directly informing our conservation planning and management moving forwards. The findings reaffirm the importance of the project area as a biodiversity hotspot, with the sustained presence of key species such as the Sunda Pangolin, Sun Bear, Bornean Crestless Fireback, and Flat-headed Cat. These results underscore the success of the project in protecting high-quality forests and preventing their conversion to large-scale acacia plantations. Without these interventions, many forest specialists would likely face significant declines due to habitat loss and degradation.

The current qualitative analysis of camera trap data highlights patterns in species presence and encounter rates. However, more advanced analyses, such as modelling species abundance or occupancy in relation to environmental factors like biomass, habitat structure, and forest regeneration, would provide deeper insights into the impacts of project interventions. Such analyses require standardised, long-term data, which the project aims to accumulate in the coming years. Future efforts will focus on more detailed evaluations of RTE species populations to better understand their dynamics and habitat use within the project area.

Freshwater fish surveys:

All information and reference have been extracted from the following report: 'Fishes of Katingan-Mentaya: Volume 1 (Preliminary Notes and Assessment of Fish Diversity in the Katingan Mentaya Project Zone accompanied by a Simple Ictiofauna Photographic Identification Guide) (Jerikho & Saputro 2023)'. The full report 'Fishes of Katingan Mentaya English.pdf', including detailed methods and results, can be found in the supporting evidence 'RTE Species: Fish Surveys' folders.

Background: Peat ecosystems are unique due to their extreme water quality parameters (Posa et al., 2011). These aquatic systems are predominantly composed of organic matter, primarily plant material, which becomes submerged over time due to high rainfall intensity in tropical regions (Wieder et al., 2006). These conditions support a distinctive and diverse range of biodiversity. As part of our ongoing biodiversity monitoring, a fish survey was conducted in 2023 as a pilot

project. The primary goal of the freshwater fish monitoring was to deepen our understanding of the aquatic species within the project area, with a particular emphasis on those species that are less well-studied.

Methods: Data collection took place between September and December 2023 (see full report by Jerikho & Saputro 2023 for more details). Five habitat types, including (1) large rivers, (2) tributaries, (3) peat swamps, (4) lakes and (5) artificial waters, were visited during this period. Three natural tributary streams (Lantabu River, Kemapit River, and Bakumin River), one man-made body of water (Hantipan Canal), a large river (Katingan River), and the Kлару Lake system were recorded as survey areas and successfully explored during the three month period. Data collection involved direct fishing using a multi-tackle approach, and this refers to a fishing method where multiple types of fishing gear or techniques are used simultaneously to maximise the catch, or target a variety of species. Additional visitations to fishermen, ornamental fish markets and interviews with local communities were also conducted in the research areas.

Three diversity indices were computed for each sampling location to describe the condition of the existing Ichthyofauna community: (1) Shannon Index (Diversity, H), (2) Dominance Index (D), and (3) Simpson's Uniformity Index (S). Diversity analysis calculations were done using the open-source application Past Version 4.06b

(<https://www.nhm.uio.no/english/research/resources/past/>), and index selection was adapted from Krebs (1999). Species richness was estimated using species accumulation methods, which describe the cumulative number of species recorded in a specific area at a given time or location (Ugland et al., 2003). This approach is commonly used in biodiversity research to assess the completeness of species representation within a community (Gotelli & Colwell, 2001; Ugland et al., 2003). For this analysis, the Individual Rarefaction and Species-Area Curve methods were applied using the open-source software PAST, version 4.06b. Catch per Unit Effort (CpUE) was used to quantify the amount or biomass of catch relative to the fishing effort expended (Poulsen & Holm, 2007). It is a valuable tool for spatial or temporal comparisons of fish catches across different fishing methods (Buchheister et al., 2013).

Results: In the surveys conducted in 2023, A total of 101 species from 33 families were identified during the freshwater fish monitoring, with 11 species potentially being new to science. These species are detailed in full in the report by Jerikho & Saputro (2023). Additionally, 12 species were recorded as endemic to Central Kalimantan. Notably, one species (*Luciocephalus cf. aura*), previously identified as a Sumatran endemic, was documented with a new natural distribution record in Central Kalimantan. Seven species are also thought to be listed as

Vulnerable (VU) on the IUCN Red List, with three listed as Endangered (EN). One species, *Chitala cf. lopis*, has also been rediscovered, after previously being declared extinct on the IUCN Red List. Current species estimates suggest that only about 30% of the total fish species in the Katingan Mentaya Project area have been documented.

The diversity indices, including measures of diversity, dominance, and evenness, indicate that the ecosystem remains in relatively good condition. Full details of the diversity metrics at each site along with the catch per effort are detailed in the report by Jerikho & Saputro (2023). The report also indicated that certain areas are experiencing threats such as climate impacts, habitat degradation, ecosystem alteration, and fishing pressures. When combined with the initial baseline surveys by OuTrop, there are thought to be at least 178 fish species known to the project zone, including six EN and 13 VU species in total.

Evaluation: Expanding the survey coverage across the project area is critical to better capture the full extent of fish diversity. Current species counts represent only a fraction of the estimated richness, and broadening the collection area will improve the representation of species in future assessments. In addition, deepening research efforts in previously surveyed locations will help refine knowledge and verify findings. Future monitoring activities should prioritise tracking populations of previously recorded species to better understand trends and ecological changes. For unique or difficult-to-identify species, collecting voucher specimens will enhance taxonomic accuracy and ensure robust data collection.

Flora surveys:

*To add to the flora species list for the project zone and area, plant data were collected using a variety of methods. These included standardized monitoring conducted in 2023 as part of the climate work (see **section 3.1**), ad hoc surveys and transects carried out during the creation of a herbarium, as well as initial surveys conducted by OuTrop (see reports by Harrison et al., 2010, 2011).*

Background: Understanding plant species composition within the project zone is critical for assessing biodiversity value, informing conservation planning, and monitoring changes over time. Previous surveys in the area provided baseline data, and we have added to these initial assessments.

Methods: Plant species were recorded through a combination of standardized vegetation monitoring carried out in 2023 as part of climate-related fieldwork (see **section 3.1**), ad hoc

surveys, and herbarium transects in 2023. See the **'Summary of Flora Exploration and Monitoring for MR.docx'** file for details of all activities related to data collection of plant flora. Data from earlier surveys by OuTrop were also reviewed to complement recent findings (see reports by Harrison et al., 2010, 2011) for details. Note that a number of herbarium samples were collected pre-2023, but were checked and validated in 2023. Given that they are likely to still persist within the project area during the monitoring period, we have included them in this report. Hence, we only report plant species records from the start of the project onward and do not include records collected exclusively between 2020 and 2023 unless they were validated as part of the 2023 assessment.

Results: From the 2023 sampling, we have added to the records of plant species found in the project area and zone since the project's inception in 2010. To date, 367 plant species were identified within the project zone, including 272 tree species and 95 non-tree species. Notably, the list includes four Critically Endangered (CR) species and eight Endangered (EN) species according to the IUCN Red List (see **section 5.3** and the **'KMP All Species List for MR Flora 2023.xlsx'** for a list of threatened plant species).

Discussion: These findings highlight the high conservation value of the project area, particularly in terms of its contribution to the protection of globally threatened plant species. The presence of multiple CR and EN species underlines the importance of continued habitat protection and monitoring efforts. Further work is needed to validate species identifications and assess changes in population status over time.

Anthropogenic threats to biodiversity

Hunting surveys:

*Hunting survey data were collected by RMU in partnership with the Indonesian NGO Lakpesdam NU, for full details of the survey methods and results see **'Hunting MR full report 2020-2023.docx'** report in the **'Anthropogenic threats: Hunting'** supporting evidence folders. Summarised hunting analyses are also provided in these supporting folders.*

Background: In Kalimantan, hunting is widespread and driven by a combination of subsistence needs and market demand (Cheyne et al., 2016; Struebig et al., 2007). Hunting is a significant focus of our monitoring in the project area due to its significant implications for local biodiversity and species conservation. The project aims to mitigate the impacts of hunting by a combination of protection, education and incentives, including providing sustainable livelihood options and

employment opportunities (see **Community section 4**). Despite these measures, some hunting activities persist within the project area. By monitoring hunting practices through time, we can continue to identify which types of species are most targeted, understand the motivations behind hunting activities, and assess the scale of hunting pressure.

Methods: During the 2021–2023 monitoring period, three separate hunting surveys were conducted across 31 villages within the project zone. No surveys were conducted in 2020. These surveys involved interviews with local communities using the same general questions as in previous monitoring reports (e.g., the **2018–2019 MR**). Topics included the purpose and frequency of hunting, targeted species, market prices, and perceptions of population trends. To ensure data accuracy, trained interviewers documented responses thoroughly. As in previous surveys, we partnered with the Indonesian NGO Lakpesdam NU to gather culturally sensitive and reliable information.

Over the three-year monitoring period, we surveyed 82–91% of the villages annually, extrapolating results to all 34 or 35 villages to enable year-on-year comparisons and assess hunting pressure comprehensively. Across the three years, 334 individuals were interviewed, with 132 hunters reporting active hunting within the project area (**Table 5.4**). At the outset of the hunting surveys in 2016, five key species were selected for monitoring due to their frequent targeting for food or trade. These species include Critically Endangered species (e.g., Sunda Pangolin: *Manis javanica*) and Vulnerable species (e.g., Sambar Deer: *Rusa unicolor*), making them valuable indicators of hunting activity—these are referred to as Group 1. Additionally, 20 other species of interest were included in the original surveys. These species, commonly hunted for subsistence or trade, range in conservation status from Endangered (e.g., Southeast Asian Box Turtle: *Cuora amboinensis*) to Near Threatened (e.g., Green Imperial Pigeon: *Ducula aenea*)—these are referred to as Group 2.

Results: Since surveys began in 2016, the number of hunters in the project area has fluctuated. In 2016, an estimated 117 hunters reported engaging in hunting activities. This number decreased to 24 in 2021, before rising again to 54 in 2022 and 75 in 2023. Despite variability in hunter numbers, the annual offtake of Group 1 species and the 20 additional Group 2 species has steadily declined since 2016. This reduction was particularly steep between 2016 and 2018, with the downward trend continuing through the 2021–2023 monitoring period (**Table 5.5**).

During the 2021–2023 monitoring period, between one and three species from Group 1 were hunted annually. The annual offtake of Group 1 species declined from 72 individuals in 2021 to

28 in 2023. Among the 20 Group 2 species, 11 species were hunted in 2021, which decreased to six by 2023. Similarly, the annual offtake for Group 2 species dropped sharply from 1,195 individuals in 2021 to 171 in 2023. The proportion of hunting for consumption also decreased, from 31% in 2021 to 11% in 2023, while the proportion of hunting for sale increased, rising from 35% in 2021 to 62% in 2023. For full results, including all species-level data, see the report 'Hunting MR full report 2020-2023.docx'.

Table 5.4. Overall summary results from the hunting interviews conducted as part of the project between 2016-2023. Consum = consumption.

	2016	2018	2019	2021	2022	2023
Number of villages surveyed	14	18	24	31	30	29
Number of villages in the project zone	34	34	34	34	34	35
Number of hunters interviewed	105	106	171	160	70	104
Number of hunters in the project area	48 (46%)	32 (30%)	47 (27%)	22 (14%)	48 (69%)	62 (60%)
Number of predicted hunters in the project area	117	60	67	24	54	75
Reason for hunting	Hobby: 44%	Hobby: 55%	Hobby: 79%	Hobby: 34%	Hobby: 24%	Hobby: 28%
	Consum: 71%	Consum: 59%	Consum: 81%	Consum: 31%	Consum: 13%	Consum: 11%
	Sale: 85%	Sale: 93%	Sale: 93%	Sale: 35%	Sale: 24%	Sale: 62%

Table 5.5. Annual hunting results for the five target species in Group 1 between 2016 and 2023 identified by our surveys. The 'Total' row represents the predicted annual offtake of these five species for all 34/35 villages.

English name	Scientific name	IUCN status (Nov 2024)	2016	2018	2019	2021	2022	2023
Heron sp.	<i>Ardea sp.</i>	Great White Egret and Great-billed Heron are both LC	73	0	0	0	0	0
Mouse Deer sp.	<i>Tragulus sp.</i>	Greater Oriental Chevrotain and Lesser Oriental Chevrotain are both LC	134	0	29	2	0	0
Bornean yellow muntjac	<i>Muntiacus atherodes</i>	NT	0	0	15	0	0	0

Sambar (Deer)	<i>Rusa unicolor</i>	VU	784	38	123	69	25	27
Sunda Pangolin	<i>Manis javanica</i>	CR	0	2	4	2	0	1
	Total		991	40	171	73	25	28

Evaluation: Since our last monitoring report, the project has conducted three additional hunting surveys. During this time, survey methodology was improved by covering more villages and conducting surveys more intensively. These efforts are expected to enhance confidence in the accuracy of the data and enable stronger, more direct comparisons between future monitoring periods.

Overall, the annual offtake of species in both Group 1 and Group 2 dropped steeply following the 2016 community interviews and has since fluctuated at a much lower level. Several factors may have contributed to changes in hunting behaviour over this period. First, patrolling activities within the project zone have increased since 2016, with additional measures, such as the installation of signposts, implemented after 2018. These enhanced protection efforts have likely made access to the project area more difficult, contributing to the observed decline in species offtake. Second, increased community engagement by the RMU team has raised awareness about the illegality of hunting activities (RMU team, pers. comm.; see **Community section 4**). Additionally, the project's livelihood programmes have offered alternative income sources, reducing reliance on forest resources (see **Community section 4**). For example, household incomes have risen in certain sub-districts, with a significant number of households now having more than one working member. This shift reflects a diversification of income sources, including firefighting, forest patrolling, restoration, rewetting, and agroforestry, generated through project activities. Such economic diversification is critical for building community resilience.

The decreasing trend in offtake corresponds with an increase in livelihood opportunities and a shift away from subsistence-based hunting. As more diverse livelihood options become available, individuals are less reliant on hunting as a primary income source. While some community members continue to hunt, they appear to target fewer species, likely reducing pressure on wildlife populations. Similar to previous surveys, a significant portion of hunting practices appears to be tied to local and cultural traditions rather than economic necessity. While it is likely that the decrease in hunting offtake is due to a diversification of income sources and alternative livelihoods, we cannot rule out the possibility that it reflects a reduction in species abundances (i.e., lower hunting success due to fewer animals). However, our camera trap monitoring data do not indicate a reduction in the encounter rate of hunted species, suggesting this explanation is unlikely. Nonetheless, we will continue to monitor both hunting patterns and wildlife populations

to better understand these dynamics. Ongoing data collection and analysis will help determine whether reduced offtake is primarily driven by shifts in community behaviour or changes in species availability. By integrating hunting survey results with long-term biodiversity monitoring, we aim to provide clearer insights into the effectiveness of conservation interventions and ensure that adaptive management strategies are informed by robust evidence.

To combat poaching and illegal logging, the project has employed several strategies (see **Community section 4**). These include livelihood transition programmes, community business support initiatives, awareness-raising and education sessions across villages, security patrols, and the installation of guard posts. Despite these efforts, a small number of IUCN Red List species were found to be hunted during the most recent monitoring period. These species include Sambar Deer (VU), Sunda Pangolin (CR), Southeast Asian Box Turtle (EN), and possibly the Greater Green Leafbird (EN). However, only one individual was recorded for the latter two species during this period. Looking ahead, it will be essential to develop informed, community-oriented conservation strategies to address persistent hunting pressure and mitigate risks to vulnerable species. Targeted patrolling efforts will focus on project boundaries and areas identified as having higher hunting risks, aiming to deter illegal hunting and better protect RTE species. Additionally, tailored outreach and education programmes will emphasise the importance of conserving RTE species, with the goal of further reducing pressures on wildlife populations.

Patrols:

Patrol records were compiled by the RMU field team, summarised patrol records are provided in the 'Rekap Global Patroli KARHUTLA 2020-2023.xlsx' and 'Data patroli Rekap_update 2020-2021-2022-2023.xlsx' files within the 'Anthropogenic Threats: Patrols' folders in the supporting evidence.

Background: To protect the project's forest area from threats such as fire, illegal logging, mining, hunting, and destructive fishing, several key initiatives have been implemented. These include patrols on land and water, manned guard posts, satellite and drone monitoring, as well as active community and stakeholder engagement. During the current monitoring period (2020–2023), the project collaborated with various teams, including the PMKK subdivision under PMK (Area Monitoring and Protection Division of RMU), fire preparedness groups, and joint patrols with authorities and law enforcement agencies, such as Water & Air Police officers.

Methods: There are three types of patrols in the project area/zone, each carried out by different teams. The first two types are regular patrols conducted by RMU teams in collaboration with local

communities, fire prevention (including regular fire prevention patrols, community and drone patrols), regular patrols for illegal activities, and incidental (often joint-patrols) patrols (see the **'Rekap Kegiatan Penegakan hukum IL 2021-2023.xls'** file in the **'Anthropogenic Threats: Patrols'** supporting folders for details of patrols carried out by authorities. Patrols are conducted at least once a month or on an as-needed basis, with their frequency adjusted to field conditions. Multiple patrols are often conducted simultaneously within smaller sub-zones (or 'zonas') within the wider project area/zone). A sub-zone (or zona) is the regional-based management division for Katingan Mentaya Project. There are six zonas, each of which has its own head and vice-head appointed by the RMU management team. Illegal hunting and logging patrols are conducted regularly, especially during periods of low fire risk. These patrols are carried out randomly to prevent offenders from predicting timing and locations. Boats are primarily used due to the project's reliance on river and canal access, supported by near real-time monitoring with satellite and drone data (see **Climate section 3** and files in the **'Anthropogenic Threats: Patrols: Drone Patrol Report Example'** supporting information folder). Patrols may also be informed by reports from community members, field teams, and staff at guard posts.

In addition to mobile patrols, biodiversity within the project area is safeguarded through other protection measures. These include manned posts at strategic locations, such as forest access points, and RSA (Regu Siaga Api; Fire Response Team) Guard Posts for fire monitoring and response. These posts are typically located at the interface between forest areas and surrounding community-managed agricultural lands in the project. During some patrols, the team also occasionally documented notable flora and fauna sightings in an ad hoc manner.

Results: During the current monitoring period (2020-2023), a total of 3,315 patrols were conducted across the project zone. This included 3,222 patrols for fire prevention (see **Figure 5.3**) and 93 patrols targeting other threats such as illegal logging and other illegal/destructive activities such as wildlife hunting and unsustainable fishing practices. Fire prevention patrols were carried out across the entire project zone. Among the six smaller zones (or zonas), the Seranau team conducted the most intensive patrols, followed by the Mendawai, Kamipang, and Pulau Hanaut teams (**Figure 5.3**). As a result of these efforts, zero fires were recorded within the project area during this period, suggesting that these interventions are having a positive impact on reducing the number of fires.

The 93 patrols targeting illegal logging and other threats during this monitoring period covered a total distance 2,075 km. Overall, from these patrols the team documented 38 signs of fishing

such as huts using for fishing activities, 1,743 signs of illegal logging, including camps or piles of timber, and 12 signs of illegal mining activities.

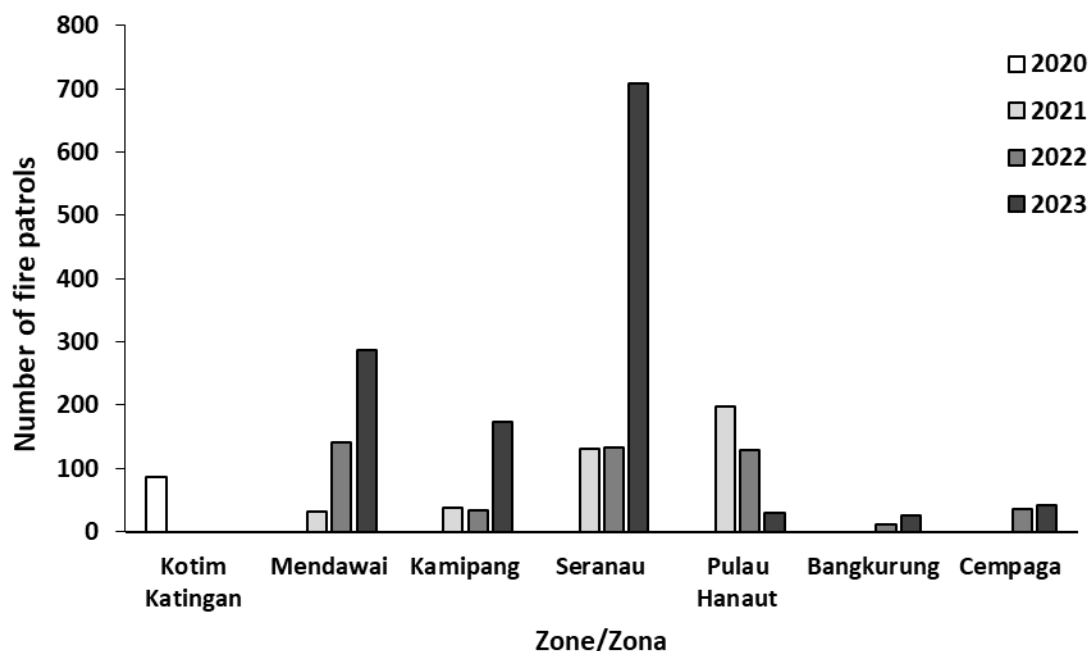


Figure 5.3. The number of patrols in the project area/zone between 2020 to 2023 for fire-prevention. In 2020, patrols were conducted across different sub-zones or zonas (i.e., Kotim Katingan), whilst from 2021 onwards, patrols were conducted within each of the six smaller zonas by separate teams (i.e., Bengkurung, Cempaga, Kamipang, Mendawai, Pulau Hanaut, and Seranau). A zone or zona is the regional-based management division for Katingan Mentaya Project. There are six zonas, each of which has its own head and vice-head appointed by the RMU management team.

Evaluation: While fires have been successfully prevented from entering the project area during the monitoring period, illegal logging remains a challenge. Unlike forest fires, which have become a high priority on the agendas of the government and most stakeholders, illegal logging is a threat that has generally received less attention (e.g., from law enforcement agencies).

To address this ongoing threat, the project team employs various approaches. The establishment of guard posts and the organisation of occasional patrols are among the preventive measures implemented to deter illegal activities and unauthorised entries. Additionally, the team works closely with local communities, employing them in programmes designed to reduce their involvement in illegal or unsustainable livelihood activities. For conciseness and clarity, we have

included a separate report detailing the methods, full results and evaluation for forest protection through patrols and other approaches.

5.3.2 Biodiversity Monitoring Plan Dissemination (CCB, B4.3)

The Katingan Mentaya Project employs a variety of strategies to disseminate information regarding its biodiversity monitoring plan and associated results. Below is a summary of the dissemination activities conducted up to the 2023 monitoring period, along with planned efforts for the next project monitoring period.

Publicly available information: The Katingan Mentaya Project biodiversity monitoring plan was developed and submitted for validation alongside the PDD on May 11, 2016. Additionally, three MRs were submitted to the CCB Standards in 2016, 2018, and 2020. All validation and verification documents for the Katingan Mentaya Project are publicly accessible on the VERRA website (<https://registry.verra.org/app/projectDetail/VCS/1477>). General project information is also available on the Permian Global (<https://permianglobal.com/projects/katingan-mentaya-project/>) and RMU (<https://rimbamakmurutama.com/projects/katingan-mentaya-project/>) websites. Biodiversity monitoring activities have occasionally been featured on social media, such as the Permian Global LinkedIn page (<https://www.linkedin.com/company/permian-global/mycompany/>), the Katingan Mentaya Project Instagram page (@katinganmentayaproject), as well as on the RMU (e.g., <https://rimbamakmurutama.com/en/news/>) and Permian Global websites. These platforms will continue to host general updates and biodiversity monitoring results over time. Project partners have also promoted biodiversity monitoring activities through their respective channels.

Dissemination to stakeholders and communities:

Informal dissemination of biodiversity monitoring activities has occurred through workshops with NGOs, village leaders, and local communities. This included discussions during the development of MoUs or annual work plans (RKTs). In addition, the Katingan Mentaya Project team actively participates in species conservation forums, such as FORINA (the Orangutan Forum) and the IUCN SSC Specialist Groups, collaborates with academic and research institutions to conduct and publish joint studies, and maintains regular communication with biodiversity-related authorities, including the Ministry of Environment and Forestry (MoEF), its regional implementing agencies, and the National Research and Innovation Agency (Badan Riset dan Inovasi Nasional; BRIN).

Based on our monitoring results, ongoing hunting and logging activities were identified, along with instances of orangutans entering community plantation areas. These findings prompted a series of more formal workshops and community outreach initiatives. In particular, during the monitoring period, several awareness and engagement sessions were conducted with local communities to promote biodiversity conservation and sustainable forest management. These included:

- **2021:** Training on Camera Trap Operation for LPHD Tampelas
- **November 2021:** Introduction to Biodiversity Survey
- **2023:** Socialization Report on Orangutan Encounters in Community Plantations, Rawa Sari–Mekarti Jaya Villages
- **August 4th 2023:** Awareness Session on Wildlife Protection and Forest Logging, Rawa Sari Village
- **August 5th 2023:** Awareness Session on Wildlife Protection and Forest Logging, Mekarti Village
- **November 28th 2023:** Awareness Socialization on Wildlife and Logging Issues, Cempaga Zone
- **November 28th 2023:** Socialization on Wildlife Hunting Awareness, Cempaka Mulia Timur Village

These outreach activities aimed to:

- Increase community understanding of the importance of protecting wildlife and maintaining forest ecosystems;
- Prevent poaching through dissemination of information on relevant laws and regulations; and
- Reduce illegal logging by promoting awareness of forest conservation principles.

Each session also encouraged positive behavioural change, such as reporting illegal activities, avoiding human–wildlife conflict, and supporting conservation and restoration initiatives. Details of these activities, including attendance lists and photographs, are provided in the supporting evidence ‘**Dissemination: Biodiversity Community Meetings**’ folders.

In addition, biodiversity-related information was shared with communities and stakeholders during the socialization of the MR7 and PD results in July 2025, as part of the PD and CCB Report process and evidence is provided in the ‘**Dissemination: PD & MR Socialization**’ folders.

Biodiversity education was also integrated into the **Environmental and Health Education Module** under the Sekolah Sehat learning program, particularly in:

- **Section 5:** Creating a Harmonious Life in Coexistence with Wildlife
- **Section 6:** Caring for and Loving Plants

This pilot program was implemented in collaboration with Kelas Lentera by Kuark International (Pepohonan Program) and involved students and teachers from SDN Parigi, SDN Telaga, SDN Parigi, SDN 2 Batuah, SDN 2 Babaluh, and SDN 5 Bapinang Hulu, with support from the Katingan and East Kotawaringin Education Agencies. See the files in supporting evidence '**Dissemination: Education Modules**' folders for more information regarding our education program and activities.

Future plans for results dissemination:

Systematic outreach efforts will be implemented in the next monitoring period, focusing on engaging communities and enhancing awareness of biodiversity conservation. During the next decade, the Katingan Mentaya Project team, in collaboration with RMU, Permian Global, and relevant partners, will continue to implement community outreach. Key activities will continue to include community-level workshops to present biodiversity monitoring findings and discuss traditional ecological knowledge, environmental education programmes in villages and schools, outreach on orangutan behaviour and ecology, and capacity-building initiatives to help communities recognise and address threats to RTE species.

All monitoring reports will continue to be publicly available on the VERRA website, accompanied by summaries in English. Updates and findings will also be published on the Katingan Mentaya Project, RMU, and Permian Global websites. Key results will be shared through presentations at conferences, seminars, and webinars, as well as through scientific journals and collaborative research with educational and research institutions. Continued engagement with local communities through MoUs, annual work plans (RKTs), and environmental education programmes reinforces the project's commitment to biodiversity conservation and community involvement.

By employing these dissemination strategies, the Katingan Mentaya Project will continue to ensure transparency and active engagement with stakeholders, communities, and the broader scientific community, reinforcing its commitment to biodiversity conservation. Publications by the Katingan Mentaya Project team and partners related to flora, fauna, habitat, threats and conservation efforts are listed in the '**KMP publications related to biodiversity.docx**' in the supporting evidence '**Dissemination**' folder.

5.4 Optional Criterion: Exceptional Biodiversity Benefits

The project is expected to generate exceptional biodiversity benefits based on multiple achievement of the criteria defined in the CCB Standards Third Edition. The project area also qualifies as a Key Biodiversity Area (KBA) based on multiple criteria, following Langhammer et al. (2007). See below section for details.

5.4.1 Trigger Species Population Trends (CCB, GL3.2, GL3.3)

Due to the high number of species that qualify as a 'trigger species', we focus on Critically Endangered (CR) and Endangered (EN) species in the table below. A full status update and summary of each trigger and/or RTE species can be found in the '**Trigger Species RTE List & Status for KMP MR 2020-2023 Update 20250715.xls**' file in the '**RTE Species**' supporting evidence folder.

Trigger Species #1	<i>Identify species</i> Bornean Orangutan (<i>Pongo pygmaeus</i>) During the current monitoring period, overall orangutan density ranged from 1.95 (95% CIs = 1.38, 2.76) in 2020 to 1.23 (95% CIs = 0.92, 1.65) in 2022, showing fluctuations in the overall population. These orangutan density estimates corresponded to an estimated population of 2,662 (95% CIs: 1881-3768) individuals within 136,729.44 ha of remaining forest in the project area in 2020 and 1,678 (95% CIs: 1253-2249) within 136,374.06 ha of forest in 2022. This was slightly lower than at the start of the last monitoring period, where density estimates ranged from 3,101 (95% CIs: 2086-4611) in 2018. In 2023, only four sites were surveyed during this year (Bakumin-Hanaut, Galinggang, Kanal Selatan and Terantang), three of which were new sites selected for having 'low-pole' (tree) density, resulting in an overall orangutan density of 0.34 (95% CIs = 0.16, 0.74). The low orangutan density observed for 2023 is primarily due to the inclusion of these three new sites, which were selected specifically for their lower-density characteristics. Thus, these values for 2023 should not be used to compare with previous estimates.
With-project Scenario	<u>Actions taken to maintain/enhance the population:</u> During the monitoring period, the project continued to implement a set of comprehensive measures to maintain and enhance the orangutan population and its habitat within the project area. Between 2020 and 2023, twelve sampling sites were located across six different sub-watersheds and surveyed over multiple years (see Figure 5.2 and 'Orangutans MR Full Report 2020-2023.docx' for sampling locations

and sampling frequency). Forest rehabilitation efforts, including replanting activities in degraded areas and along fire breaks, have expanded forest extent and improved habitat quality in these areas. These measures aim to increase the availability of suitable habitats for orangutans. Additionally, targeted fire prevention strategies, such as patrols and fire management activities, have minimised fire-related habitat loss across the monitoring period, which is a critical threat to orangutan populations. Community engagement has also been a cornerstone of the project's strategy, with outreach programmes promoting alternative livelihoods, raising awareness about orangutan conservation (see **Community section 4**).

Actions taken to reduce threats:

The project has focused on reducing key threats to orangutans through a combination of monitoring, enforcement, and community involvement. To prevent illegal activities such as logging and hunting, regular security patrols and near real-time forest monitoring using satellite imagery have been implemented. Effective communication between technical teams and field staff ensures that any identified threats are swiftly addressed on the ground. Partnerships with enforcement agencies, such as the Water & Air Police Unit, further strengthen the project's capacity to respond promptly to illegal activities. Fire risk mitigation has been another critical focus area, with fire patrols, management of fire-prone areas, and replanting initiatives aimed at preventing large-scale habitat destruction caused by fires. Community-based conservation programmes, which promote alternative income generation, have also reduced reliance on activities that harm forest habitats (see **Community section 4**).

Changes in population status and/or threats:

Our monitoring results indicate that orangutan density within the project area has fluctuated since surveys began in 2002, with density estimates ranging from 1.5 individuals per km² in 2002 to 1.23 individuals per km² in 2022, although note the different sampling locations and methodologies between these years (see '**Orangutans MR Full Report 2020-2023.docx**'). The overlapping confidence intervals from these years suggest that the overall changes in population density are not statistically significant, pointing to relative stability within the context of natural population fluctuations. However, variations in survey effort and changes in sampling site locations over

time limit robust statistical comparisons through time. While a substantial and important population of orangutans remains within the project area, the density observed at the end of this monitoring period (1.23 individuals per km² in 2022) was lower than that recorded at the start of the previous monitoring period (2.26 individuals per km² in 2018). Although this timeframe is too brief to establish a definitive trend, the observed decline may result from various factors, such as habitat quality, disturbances (i.e., by illegal logging), or changes in survey methodology. Where possible, future monitoring will aim to refine data collection methods, improve consistency in sampling locations, and address potential threats. Strengthened enforcement, bolstered by ongoing collaboration with enforcement agencies and the use of satellite monitoring, will ensure swift responses to illegal activities. Community engagement programmes will also be expanded to further promote awareness of orangutan conservation. Together, these actions will help maintain a stable and resilient orangutan population within the project area, ensuring its long-term survival

Trigger Species #2

Critically Endangered (CR) and Endangered (EN) fauna

Below, we provide a list of the CR and EN fauna recorded in the project area since the project's inception in 2010. As the habitat for these species remains intact, we assume they continue to reside within the project area, even if they were not observed during this monitoring period. This assumption aligns with the precautionary principle (see **section 5.1.1**). A full fauna species list is provided in the '**KMP All Species List for MR Fauna 2023.xls**' file in the '**Species Lists**' supporting evidence folder along with a status update and summary of each RTE species in the '**Trigger Species RTE List & Status for KMP MR 2020-2023 Update 20250715.xls**' file.

Mammals: Bornean Orangutan (CR; *Pongo pygmaeus*), Sunda Pangolin (CR; *Manis javanica*), Proboscis monkey (EN; *Nasalis larvatus*), Bornean White-bearded Gibbon (EN; *Hylobates albibarbis*), Hairy-nosed Otter (EN; *Lutra sumatrana*), Sunda Clouded Leopard (EN; *Neofelis diardi*), Flat-headed Cat (EN; *Prionailurus planiceps*), Otter Civet (EN; *Cynogale bennettii*), Long-tailed Macaque (*Macaca fascicularis*), Southern Pig-tailed Macaque (EN; *Macaca nemestrina*), Large Flying

	Fox (<i>Pteropus vampyrus</i>). See Figure 5.4 for photographs of some of the primate trigger species taken with the project area and/or zone. <u>Birds:</u> White-shouldered ibis (CR; <i>Pseudibis davisoni</i>), Helmeted Hornbill (CR; <i>Rhinoplax vigil</i>), Storms Stork (EN; <i>Ciconia stormi</i>), Greater Green Leafbird (EN; <i>Chloropsis sonnerati</i>), Javan White-eye (EN; <i>Zosterops flavus</i>), Far Eastern Curlew (EN; <i>Numenius madagascariensis</i>), Great Knot (EN; <i>Calidris tenuirostris</i>), Wrinkled Hornbill (EN; <i>Rhabdotorrhinus corrugatus</i>), Bornean Crestless Fireback (EN; <i>Lophura pyronota</i>), Lesser Sandplover (<i>Charadrius mongolus</i>). <u>Other taxa:</u> Malaysian Giant Turtle (CR; <i>Orlitia borneensis</i>), Southeast Asian Box Turtle (EN; <i>Cuora amboinensis</i>), Spiny Turtle (EN; <i>Heosemys spinosa</i>), False Gharial (<i>Tomistoma schlegelii</i>), White-edged Whipray (EN; <i>Fluvitrygon signifer</i>), Foersch's Betta (Betta foerschii), Asian Arowana (EN; <i>Scleropages formosus</i>), <i>Leiocassis myersi</i> (unnamed fish species), <i>Sphaerichthys vaillanti</i> (unnamed fish species), Peppermint Pikehead (<i>Luciocephalus aura</i>).
With-project Scenario	<u>Actions taken to maintain/enhance the population:</u> During the monitoring period, various measures have been implemented to support the survival of CR and EN species within project area. The project prioritises forest conservation and promotes both active and natural regeneration to enhance habitat quality. Efforts such as replanting in degraded areas and establishing fire breaks are thought to have expanded suitable habitats for key species in certain areas, including the Bornean Orangutan. Moreover, preventing forest conversion has mitigated human-wildlife conflict for adaptable species like the Sunda Pangolin and Southern Pig-tailed Macaque. These initiatives are expected to significantly benefit CR and EN species populations over the medium and long term. <u>Actions taken to reduce threats:</u> The project has addressed key threats to CR and EN fauna through targeted conservation actions. Satellite monitoring and regular patrols have been crucial in identifying and addressing illegal logging, hunting, and other disturbances within the project area during the monitoring period. Fire management efforts, including patrols and replanting, have also mitigated the risks of large-scale habitat destruction caused by fires. Community outreach and education programmes have promoted sustainable livelihoods, reducing pressures on forest resources. Whilst

hunting surveys have also been conducted to monitor hunting levels, and targeted action will be taken if hunting pressure increases. Since our last monitoring report, the project has conducted an additional three hunting surveys. During this time, we have improved the survey methodology by covering more villages and conducting the surveys more intensively. The decreasing trend in offtake aligns with an upward trend in increased livelihoods and an apparent shift away from subsistence-based hunting. With more diverse livelihood options introduced through project activities, individuals are less reliant on hunting as a primary income source. While some continue to hunt, they appear to take fewer species, reducing the pressure on wildlife populations. These efforts are likely to be particularly important for species heavily impacted by hunting, such as the Sunda Pangolin. Partnerships with local enforcement agencies have further strengthened the project's capacity to address illegal activities effectively.

Changes in population status and/or threats:

Although explicit population data for most CR and EN fauna were not collected during the last monitoring period, evidence from camera trap surveys, line transects, and field observations confirms the presence of at least one individual of each RTE/trigger fauna species within the project area or zone during the monitoring period. The persistence of these species underscores the effectiveness of the project's conservation measures. Without the project, much of the forest would have been converted to acacia plantations, leading to significant habitat loss and the long-term decline of many threatened fauna populations. By maintaining forest habitats and addressing key threats, the project has ensured the continued presence of these species within the project area.

Trigger Species #3

CR and EN flora

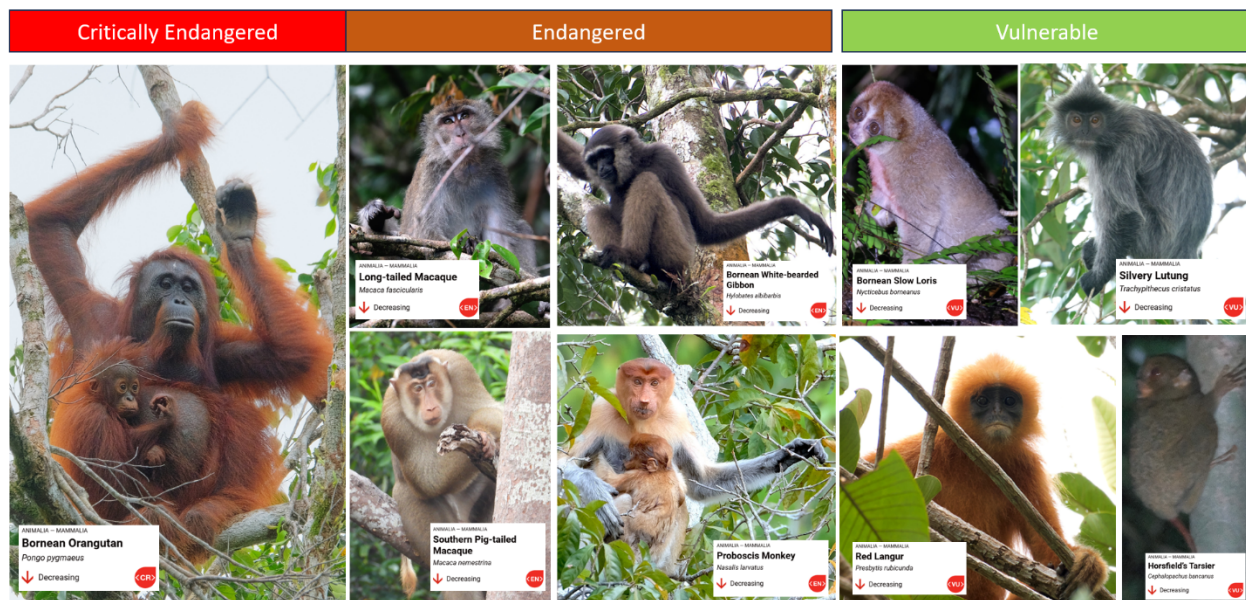
Below, we provide a list of CR and EN flora recorded in the project area since the project's inception in 2010. As the habitat for these species remains intact, we assume they continue to reside within the project area, even if they were not observed during this monitoring period. This assumption aligns with the precautionary principle (see **section 5.1.1**).

	A full flora species list is provided in the 'KMP All Species List for MR Flora 2023.xlsx' file in the supporting evidence. CR and EN species include: Bintangur (CR; <i>Calophyllum calcicole</i>), Ramin (CR; <i>Gonystylus bancanus</i>), Meranti Bunga (CR; <i>Shorea</i> (formally <i>Rubroshorea</i>) <i>teysmanniana</i>), <i>Dipterocarpus coriaceus</i> (CR; unnamed tree species), Alau (EN; <i>Dacrydium pectinatum</i>), <i>Calophyllum aureum</i> (EN; unnamed tree species), <i>Shorea</i> (formally <i>Rubroshorea</i>) <i>platycarpa</i> (EN; unnamed tree species), <i>Shorea</i> (formally <i>Rubroshorea</i>) <i>uliginosa</i> (EN; unnamed tree species), Resak Durian (EN; <i>Cotylelobium burckii</i>), Senkuang (EN; <i>Dracontomelon costatum</i>), <i>Shorea</i> (EN; formally <i>Rubroshorea</i>) <i>bracteolata</i>, <i>Shorea</i> (EN; formally <i>Rubroshorea</i>) <i>pallidifolia</i>).
With-project Scenario	<u>Actions taken to maintain/enhance the population:</u> Since the project's inception, including during the current monitoring period, significant efforts have been undertaken to protect and enhance the populations of CR and EN flora within the project area. Initial vegetation surveys, vegetation sampling, climate-related vegetation measurements, and herbarium sample creation have documented the presence of at least one individual of species such as Bintangur (CR; <i>Calophyllum calcicole</i>) and Ramin (CR; <i>Gonystylus bancanus</i>) (see list above). These species were thought to be present at the project's inception and are thought to have remained present due to the project's protective measures. Forest protection and regeneration efforts have ensured the survival of these flora species by maintaining ecosystem integrity and reducing habitat fragmentation. <u>Actions taken to reduce threats:</u> To address threats to CR and EN flora, the project has implemented several conservation actions during the latest monitoring period. Satellite monitoring and regular patrols have been employed to monitor and reduce illegal logging and forest clearing, which are significant risks to many threatened flora species. Fire prevention strategies, including patrols and the management of fire-prone areas, have mitigated the risk of habitat loss from fires. Community engagement and education programmes have promoted sustainable practices. These efforts have helped reduce pressures on these vulnerable species from activities such as illegal logging and land conversion.

Changes in population status and/or threats:

Detailed population data for individual CR and EN flora species have not been collected due to the large number of plant species within the project area and zone. Instead, monitoring has focused on compiling a comprehensive species list and assessing the overall state of vegetation. Evidence from surveys confirms the continued presence of CR and EN flora species, underscoring the project's success in maintaining these populations. Without the project's protective measures, much of the natural vegetation would have been replaced by acacia plantations dominated by generalist plant species. This conversion would have resulted in the loss of CR and EN flora, such as *Rubroshorea teysmanniana* and *Gonystylus bancanus* tree species, which require intact forest ecosystems to thrive.

Figure 5.4. Photographs of all nine primate species in Katingan Mentaya Project area or zone taken during this monitoring period. Photo credit: KMP, Meyner Nusalawo and Suryadi.



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APPENDIX 1: NEW PROJECT AREAS AND STAKEHOLDERS

There are no new project areas neither stakeholders during the reporting period.

APPENDIX 2: PROJECT RISKS TABLE

	Identified risk(s)	Potential impact of risk on stakeholders, ecosystem health, and biodiversity	Mitigation or preventative measure(s) taken
Natural and human induced risks to stakeholders' wellbeing	Fires, floods, pest outbreaks, COVID-19, extreme weather events	Displacement, illness, economic loss, reduced quality of life	Community-based fire brigades, health programmes, early warning systems, resilient infrastructure, COVID-19 response
Risks to stakeholder participation	Low engagement of women, youth, minority voices	Social exclusion, limited uptake of programmes	Participatory consultations, inclusive facilitation protocols, support for marginalised groups
Working conditions	Inconsistent labour terms, safety risks in the field	Injury, labour exploitation, reputational risk	Clear labour agreements, BPJS insurance coverage, HSE protocols, regular training
Safety of women and girls	Risk of harassment or lack of safe spaces	Psychological and physical harm, exclusion from benefits	Women-led spaces, safe reporting channels, gender-sensitive protocols and staff presence
Safety of minority and marginalised groups, including children	Unequal access to benefits, potential exclusion from programmes	Increased vulnerability, inequity in project outcomes	Representation in MoUs, tailored programmes, child protection campaigns

Pollutants (air, noise, discharges to water, generation of waste, and release of hazardous materials and chemical pesticides and fertilisers)	Improper waste management, water contamination	Community health risks, aquatic ecosystem degradation	River toilet removal, improved waste systems, eco-friendly practices, no chemical pesticide use
Discrimination	Gender, ethnic, or class-based biases	Reduced access to opportunities and participation	Anti-discrimination policies, inclusive planning, monitoring of participation indicators
Sexual harassment	Field and workplace risks	Violation of rights, reduced female participation	Mandatory training, grievance channels, female focal points
Equal pay for equal work	Gender-based pay disparities	Income inequality, reduced motivation	Equal pay policy enforced, regular wage reviews
Gender equity in labour and work	Underrepresentation of women in technical roles	Gender imbalance in benefits and leadership	Women's leadership training, quotas in field roles, support for 11 women-led groups
Forced labour¹⁶	Risk in indirect labour supply chains	Human rights violations	Contractual clauses, monitoring, community-based hiring only
Child labour	Children assisting in NTFP collection or family enterprises	Legal violations, harm to children's development	Awareness and education programmes, community enforcement, youth scholarships

¹⁶ The identified risks and commensurate mitigation or preventative measure(s) for forced labour, child labour, and human trafficking, must be inclusive of staff and contracted workers employed by third parties.

Human trafficking	Low risk in context, but potential via external contractors	Rights violations, reputational risk	All labour sourced locally, no migrant workers used, community vetting of hires
Recognition of, respect of, and promotion of the rights to IPs, LCs and customary rights holders	Overlooking customary rights or FPIC	Conflict, land disputes, exclusion of local knowledge	FPIC integrated, customary institutions involved in MoUs, social forestry (LPHD) supported
Preserving and protecting cultural heritage	Infrastructure overlapping with cultural sites	Loss of spiritual and cultural identity	Cultural mapping, exclusion of sites from activity zones, consultations with elders
Protecting and preserving property rights, customary rights, or protecting legal or customary tenure/access rights to territories, property, and resources, including collective and/or conflicting rights	No risk identified	Communities are outside the project area	
Impacts on biodiversity and ecosystems	No risk identified	Conservation focused project activities enhance rather than degrade ecosystems	
Soil degradation and soil erosion	No risk identified	Soils are not degraded by project activities; rewetting reduces exposure	

Water consumption and stress	No risk identified	Project does not overuse water resources; hydrology is being restored	
Habitats (and areas needed for habitat connectivity) for rare, threatened, and endangered species	No risk identified	Project protects and improves connectivity for RTE species	
Areas needed for habitat connectivity	No risk identified	All activities planned to maintain or enhance natural connectivity	
Invasive species	No risk identified	Aquaculture and agroforestry training emphasise ecological integrity	
Ecosystem conversion	No risk identified	Entire concession is under legal protection and managed for ecosystem preservation	
[Additional risk identified]			
.....			

APPENDIX 3: COMMERCIALLY SENSITIVE INFORMATION

Section	Information	Justification
2.5.6 – Benefit Sharing Mechanism	Specific terms of benefit-sharing agreements with communities or stakeholders	Disclosure may affect negotiation dynamics, trust, and the confidentiality of agreements requested by communities
2.2 – Project Implementation Status	Financial details of operational and capital expenditures	Public release could compromise the project's competitive position and budgeting strategy
4.1 – Net Positive Community Impacts	Personal details of community members (names, contact info, demographics)	Required to comply with data protection laws and protect individual privacy
5.1 – Net Positive Biodiversity Impacts	Locations and names of endangered species within the project area	Disclosure could lead to poaching or disturbance of critical habitats
3.5.2– 3.5.4 – Strategic Partnerships	Financial partnerships and stakeholder agreements	Strategic information not publicly available; release could harm business competitiveness
Annex – Forest Disturbance Analysis	High-resolution satellite imagery and GIS shapefiles of project, proxy, and buffer zones	Imagery and files are proprietary or sensitive; may be misused or reverse engineered
Appendix – Hydrological Modelling	Computer model code for hydrological analysis	Represents intellectual property with unique methodological value
Appendix – Social	Raw data from community surveys and meeting minutes	Disclosure could violate confidentiality agreements with individual participants

Assessments		
Appendix – Biodiversity Monitoring	Exact GPS locations of camera traps and sensitive species	May increase risks from illegal wildlife trade or harassment of species
Appendix – Project Budgets	Detailed project workplans and financial allocations	Disclosure may benefit competitors and compromise strategic decision-making

APPENDIX 4: COMMUNITY TRACKER

No	Activity	No	Monitoring Indicator	Description	Monitoring Frequency	MR Indicator
1	Social forestry facilitation	1	Permits granted for social forestry	Number of social forestry unit (new permit or agreement)	Every year	Improved LPHD Capacity and secure land tenure for community forest group
		2	Trainings and workshop related to social forestry	Number of training/workshop conducted and people participated, to increase capacity building	Every year	# of people trained (% of woman)
		3	Socialization and consultation related to social forestry	Number of meetings and people participated to improved coordination and awareness raising	Every year	Improved participation
		4	MoU between RMU and village forest	Number of signed MoU to support the operational of village forests	Every year	Improved capacity and governance
		5	Number of people involved in social forestry patrols and surveys	Number of people involved as daily labour	Every year	Improved livelihoods and job provision
2	Participatory planning	1	Signed MoU between village and RMU	Number of signed MoU	Every year	Improved participation
		2	Socialization and consultation	Number of meetings and people	Every year	Improved participation

			<i>related to MoU, village maps, workplan, PD, MR and others at village level</i>	<i>participated to improved coordination and awareness raising</i>		
		3	Village maps produced	Number of village maps	Every year	Improved participation
		4	Socio-economic baseline report	Number of reports	Every 10 years	Improved capacity and governance
		5	Grievance cases	Number and list of grievances	Every year	Improved well being.
3	Stakeholder engagement	1	Socialization and consultation related to RMU activities with stakeholders at sub-district, district, provincial, national and other institutions	Number of meetings and people participated to improved coordination and awareness raising	Every year	Improved participation
		2	Reports submitted or disseminated to government institutions and other stakeholders	Number of reports	Every year	Improved capacity and governance
4	Strengthening local institution	1	Training and workshop for local institutions (village official, customary institution, BumDes, and others)	Number of training/workshop conducted and people participated, to increase capacity building	Every year	Improved local institution capacity
5	Public health	1	Support for healthcare services	Number of supports and people benefited from RMU's support	Every year	Improved healthcare

		2	Trainings for local health care provider and practitioners	Number of training/workshop conducted and people participated, to increase capacity building	Every year	Improved health
		3	Socialization and consultation related to public health	Number of meetings and people participated to improved coordination and awareness raising	Every year	Improved health
6	Water, sanitation and hygiene	1	Installation of sanitary facilities and clean water for community (such as: clean water well, latrines, washing stand and others)	Number of facilities and people received benefit from this program	Every year	Improved water quality
		2	Socialization and consultation related to water, sanitation, hygiene	Number of meetings and people participated to improved coordination and awareness raising	Every year	Improve water provision
7	Renewable energy	1	Installation of renewable energy for local community	Number of solar panel installation and beneficiary (people)	Every year	Improved livelihood
		2	Socialization and consultation related to renewable energy	Number of meetings and people participated to improved	Every year	Improved livelihoods and job provision

				coordination and awareness raising		
		3	Local people's involvement in renewable energy installation	Number of people involved as daily labour	Every year	Improved livelihood
8	Education and culture	1	Operational support for local schools	Number of activities supported by RMU for local school and people involved	Every year	Improved education
		2	Internship support for students	Number internships and number of students undertook internship with RMU	Every year	Improved education
		3	Formal and non-formal educational supports	Number supports and number of people received formal and non-formal educational support from RMU	Every year	Improved education
		4	Training and workshop for local teacher	Number of training/workshop conducted and people participated, to increase capacity building	Every year	Improved education
		5	Operational support for social and cultural activities	Number of proposal/activities supported by RMU	Every year	Improved education
9	Small and medium enterprises	1	Socialization and consultation related to the establishment and	Number of meetings and people	Every year	Improved livelihoods

			development of small and medium enterprises	participated to improved coordination and awareness raising		and job provision
		2	Operational supports for small and medium enterprises	Number of small and medium enterprises received operational support from RMU	Every year	Improved livelihood

		3	Training, capacity building, certification for small and medium enterprises	Number of trainings and other capacity development/technical support provided by RMU	Every year	Improved capacity and governance
10	Microfinance	1	Microfinance beneficiaries	Number cumulative member in the microfinance program per year	Every year	Improved livelihood
		2	Socialization and consultation related to microfinance program Number of meetings and people	participated	Every year	Improved livelihoods and job provision
11	Livestock	1	Operational support for livestock program	Number of people received operational support	Every year	Improved livelihood
		2	Training or workshop for local people regarding livestock activities	Number of training/workshop and people participated	Every year	Improved livelihoods and job provision
		3	Socialization and consultation regarding livestock program	Number of meetings and people	Every year	Improved livelihoods

				<i>participated to improved coordination and awareness raising</i>		<i>and job provision</i>
1 2	Aquaculture and sustainable fishery	1	Operational support for aquaculture and sustainable fisheries program	Number of people received operational support	Every year	Improved livelihood
		2	Training or workshop for local people regarding aquaculture and sustainable fisheries	Number of training/workshop and people participated	Every year	Improved livelihoods and job provision
		3	Socialization and consultation regarding aquaculture and sustainable fisheries	Number of meetings and people participated to improved coordination and awareness raising	Every year	Improved livelihoods and job provision
1 3	Ecotourism facilitation	1	Operational support for tourism facilitation	Number of institution received operational support	Every year	Improved livelihood
		2	Training or workshop for tourism facilitation	Number of training/workshop and people participated	Every year	Improved livelihoods and job provision
		3	Socialization and consultation regarding ecotourism facilitation	Number of meetings and people participated to improved coordination and awareness raising	Every year	Improved livelihoods and job provision
1 4	NTPF	1	Operational support for NTPF initiative	Number of farmers or handcrafters received operational support	Every year	Improved livelihood
		2	Training for local farmers or handcrafters	Number of training/workshop and people involved	Every year	Improved livelihoods

						and job provision
		3	Socialization and consultation related to NTFP initiative	Number of meetings and people participated to improved coordination and awareness raising	Every year	Improved livelihoods and job provision
15	Agroforestry	1	Lands in the project zone implementing zero burning and zero chemical practices (ha)	Hectares	Every year	Improved livelihoods and job provision
		2	Farmers involved in the Agroecology Farmer School (STA)	Number of farmers	Every year	Improved livelihood
		3	Local people's involvement in STA and agroforestry demonstration plot establishment	Number of people involved as daily labour	Every year	Improved livelihood
		4	Training and workshop for STA member or local farmers	Number of training/workshop and people participated	Every year	Improved livelihoods and job provision
		5	Socialization and consultation regarding agroforestry and zero burning zero chemical farming practices	Number of meetings and people participated to improved coordination and awareness raising	Every year	Improved livelihoods and job provision
16	Reforestation	1	Local people's involvement in reforestation activities	Number of people involved as daily labour in reforestation activities (planting, survey, land preparation, seedling	Every year	Improved livelihood

				preparation, biobag production)		
		2	Socialization and consultation related to reforestation activities	Number of meetings and people participated to improved coordination and awareness raising	Every year	Improved capacity and governance
		3	Trainings related to reforestation	Number of training/workshop and people involved	Every year	Improved livelihoods and job provision
17	Rewetting	1	Local people's involvement in rewetting activities	Number of people involved as daily labour	Every year	Improved livelihood
		2	Socialization and consultation related to rewetting activities	Number of meetings and people participated to improved coordination and awareness raising	Every year	Improved livelihood
18	Fire prevention and fire fighting	1	Local people's involvement in fire prevention and fire fighting activities	Number of people involved as daily labour	Every year	Improved livelihood
		2	Fire prevention training & workshops	Number of training/workshop conducted to increase capacity building	Every year	Improved capacity and governance
		3	Fire prevention socialization and coordination events	Number of socializations and people participated to increase awareness of fire and improve coordination among stakeholders	Every year	Improved livelihoods and job provision

19	Illegal logging and poaching prevention	1	Local people's involvement in illegal logging and poaching prevention	Number of people involved as daily labour	Every year	Improved livelihood
		2	Number of illegal logger and poacher received training or operational supports in an attempt to shift their livelihoods	Number of activities and number of people	Every year	Improved livelihood
		3	Socialization and consultation related to illegal logging and poaching prevention	Number of meetings and people participated to improved coordination and awareness raising	Every year	Improved capacity and governance
20	Species conservation and habitat management	1	Local people's involvement in biodiversity survey	Number of people involved as daily labour	Every year	Improved livelihood
21	Research and development	1	Research and collaboration	Number of research and external researchers involved	Every year	Improved capacity and governance
		2	Local people's involvement in the research activities	Number of people involved as daily labour	Every year	Improved livelihood
22	GEDSI mainstreaming	1	Socialization and consultation related to GEDSI mainstreaming	Number of meetings and people participated to improved coordination and awareness raising	Every year	Improved capacity and governance

		2	Small scale enterprises that generate income for women	Number of woman groups established	Every year	Improved livelihood
23	Human Resources Development	1	Training, workshop, conference for staff	Number of training/workshop and staff participated	Every year	Improved capacity and governance
		2	RMU's staff originally from project zone	Number of staff originally from project zone	Every year	Improved livelihood
24	Logistic and infrastructure	1	Local people's involvement in the logistic and infrastructure activities	Number of people involved as daily labour	Every year	Improved livelihood
25	HSES	1	Accidents	Number and list of accidents	Every year	Improved well-being
		2	HSES induction and inspection by RMU	Number of induction and inspection, number of people participated	Every year	

APPENDIX 5: DETAILED SUSTAINABLE DEVELOPMENT CONTRIBUTIONS

Row No.	SDG target	SDG indicator	Net impact on SDG indicator	Current project contributions (2020-2023)	Contributions over project lifetime																				
	SDG Target number	Number and text of SDG indicator or, if no official SDG indicator is applicable, user-defined indicator	Indicate the project's contribution to the SDG Indicator (implemented activities to increase or decrease)	Brief description of the quantifiable impact of the project's activities related to the SDG indicator, during the monitoring period.	Brief description of the cumulative quantifiable impact of the project's activities related to the SDG indicator, over the project lifetime.																				
1	1.1	1.1.1 population living below the international poverty line, \$1.25 a day	Reduces poverty by creating decent local jobs with fair wages in fire prevention, forest patrols, reforestation, rewetting, biodiversity protection, and logistics.	Create Decent Job for local communities <table><tr><td>Year</td><td>2020</td><td>2021</td><td>2022</td><td>2023</td></tr><tr><td>Working Days</td><td>8,922</td><td>9,708</td><td>21,585</td><td>49,641</td></tr><tr><td>FTE conversion</td><td>39</td><td>42</td><td>94</td><td>216</td></tr><tr><td>divided into 230 days in a year</td><td colspan="4">391 communities (12% Females)</td></tr></table>	Year	2020	2021	2022	2023	Working Days	8,922	9,708	21,585	49,641	FTE conversion	39	42	94	216	divided into 230 days in a year	391 communities (12% Females)				A total of 391 local people gained decent jobs. The project's daily wage (IDR 120,000) is six times higher than the international poverty line (\$1.25/day).
Year	2020	2021	2022	2023																					
Working Days	8,922	9,708	21,585	49,641																					
FTE conversion	39	42	94	216																					
divided into 230 days in a year	391 communities (12% Females)																								
	1.2	1.2.1 Proportion of population living below the national poverty line	Reduces national poverty by providing formal employment.	Create permanent jobs <table><tr><td>Year</td><td>2020</td><td>2021</td><td>2022</td><td>2023</td></tr><tr><td>Employment (people)</td><td>146</td><td>161</td><td>198</td><td>193</td></tr><tr><td colspan="5">Average 176 people per year (21% Females)</td></tr></table>	Year	2020	2021	2022	2023	Employment (people)	146	161	198	193	Average 176 people per year (21% Females)					Employed an average of 176 people per year, 82% recruited locally.					
Year	2020	2021	2022	2023																					
Employment (people)	146	161	198	193																					
Average 176 people per year (21% Females)																									
	1.3	1.3.1 social protection for direct staff	Social protection for staff and long-term casual workers	An average of 176 permanent staff are covered by national health and pension insurance yearly; long-term casual workers receive accident insurance.	Permanent staff covered by social security																				

Row No.	SDG target	SDG indicator	Net impact on SDG indicator	Current project contributions	Contributions over project lifetime																																									
1	1.4	1.4.1 Proportion of population living in households with access to basic services	Increase access to basic services: Livelihood, Education & Culture, Healthcare, Water Quality & Sanitation	<table><tr><td></td><td>2020</td><td>2021</td><td>2022</td><td>2023</td></tr><tr><td rowspan="2">Livelihood</td><td>1,343</td><td>1,367</td><td>1,845</td><td>1,832</td></tr><tr><td colspan="4">Total 3,987 (15% Females)</td></tr><tr><td rowspan="2">Education & Culture</td><td>210</td><td>226</td><td>382</td><td>465</td></tr><tr><td colspan="4">Total 640 (50% Females)</td></tr><tr><td rowspan="2">Health care</td><td>416</td><td>1,054</td><td>1,274</td><td>1,523</td></tr><tr><td colspan="4">Total 2,417 (68% Females)</td></tr><tr><td rowspan="2">Water Quality & Sanitation</td><td>157</td><td>12</td><td>76</td><td>27</td></tr><tr><td colspan="4">Total 268 (29% Females)</td></tr></table>		2020	2021	2022	2023	Livelihood	1,343	1,367	1,845	1,832	Total 3,987 (15% Females)				Education & Culture	210	226	382	465	Total 640 (50% Females)				Health care	416	1,054	1,274	1,523	Total 2,417 (68% Females)				Water Quality & Sanitation	157	12	76	27	Total 268 (29% Females)				• Livelihood: 7,866 people • Education & Culture: 1,051 people • Healthcare: 3,283 people • Water Quality & Sanitation: 1,301 people
	2020	2021	2022	2023																																										
Livelihood	1,343	1,367	1,845	1,832																																										
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	Total 268 (29% Females)																																													
		1.4.2 Secure tenure rights to land, (a) with legally recognized documentation	Strengthens tenure rights and empowers community forest groups to manage forests sustainably and earn income.	Tenure Rights to Land (2018–2024) • Facilitated legal forest management rights for 11 villages under the Social Forestry scheme. • Strengthened community forest groups to manage forests sustainably and generate income. Villages with Legal Tenure (facilitated 2018–2023) • 11 villages forest, total of 35,855 ha • Names of the villages: Telaga, Tampelas, Mendawai, Tumbang Bulan, Perigi, Tewang Kampung, Hanaut, Mentaya Seberang, Kampung Melayu, Teluk Sebulu.	11 village forest communities have secured 35-year rights to manage their forests, total 35,855 ha																																									

Row No	SDG target	SDG indicator	Net impact on SDG indicator	Current project contributions	Contributions over project lifetime
2	2.1	2.1.1 Prevalence of under-nourishment	Increase awareness on important of breastfeeding & nutrition for children to reduce malnutrition	Integrated Health Services (Pos Yandu) 55 Pos Yandu supported in 34 villages, providing maternal and child health services for children under five—such as immunizations, nutrition monitoring, growth tracking, breastfeeding support, and early malnutrition detection. 650 volunteer health workers and providers trained to improve service quality.	Enhance capacity of 55 Pos Yandu as a community health platform.
	2.2	2.2.1 Prevalence of stunting among children under 5 years of age	Increase awareness on important of healthy pregnant, anaemia, female reproductive health and stop child marriage to reduce stunting	Working together with Puskesmas and village nurse, conduction following activities: 55 Pos Yandu: stunting screening and checking, additional nutrition for children and early detection of malnutrition. Zero Stunting Campaign: 907 participants fostering awareness and community engagement to combat stunting (2023). Health Education: for pregnant woman and adult, awareness raising the link between stunting with pregnancy, anaemia, female reproductive health and stop child marriage.	
		2.2.2 Prevalence of malnutrition children under 5 years			
		2.2.3 Prevalence of anaemia in women aged 15 to 49 years		732 adolescents (age 15–18) in 4 villages received education on reproductive health, early marriage prevention, and anaemia in young women (2023), in Batuah, Ganepo, Mendawai, Terantang (2023).	
	2.3	2.3.1 Volume of production per labour unit by classes of farming/pastoral/forestry enterprise	Increase capacity of STA member and land access for forest community	900 STA members (CADASTA registry) receive capacity-building, technical assistance, assets support and operational costs to implement sustainable farming practices. 11 villages obtained their legal right to manage their village forest for 35 years.	900 STA members trained 11 village forest communities have secured 35-year tenure rights to manage their village forests.
		2.3.2 Average income of small-scale food producers, by sex	Improve income to reduce extreme poverty	11 women's groups with 83 active members were empowered through training and microfinance support to run home-based businesses such as catering, food stalls, and snack production using local crops like banana, sago, cassava, cinnamon, coffee, and ginger (Mendawai village).	1,306 people have benefited from the microfinance program. 83 active women members earn IDR 50,000–100,000 per day, helping reduce extreme poverty.
2	2.4	2.4.1 Increase farmer productivity & production	No-burn and no-chemical input methods (TBTk/CSA) reduce emission from land	Sustainable Farming Practices (2020-2023) Implement resilient agricultural practices for farmer group, to increase productivity and production, while maintain	Strengthening climate resilient community.

			burning when community do land clearing	ecosystems, strengthen capacity for adaptation to climate change and improve land and soil quality. • 909 Farmers registered in CADASTA platform, member of Agroecology Farmer School (STA), they receive technical assistance, capacity-building, assets support and operational costs to implement sustainable farming practices. • Adopt no-burn and no-chemical input methods (TBTk/CSA) on their lands, piloting in Seranau, Pulau Hanaut, and Mendawai. • 891 ha, community land to practice TBTk/CSA method. • 401 people involved in Demonstration Plot establishment. • 122 ha Demonstration Plot for CSA practising in collaboration with village government, community group, FMU.	
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Row No	SDG target	SDG indicator	Net impact on SDG indicator	Current project contributions	Contributions over project lifetime
3	3.1	3.1.1 Maternal mortality ratio	Raising awareness and attribute to child mortality	Strengthened 55 Posyandu across 34 villages to address maternal and child health. Services include pregnancy monitoring, health education, immunizations, breastfeeding support, and nutrition tracking to reduce mortality, disease, and stunting.	Strengthened 55 Pos Yandu and enhance capacity of 406 health cadres capacity
	3.2	3.2.1 Under-5 mortality rate		406 health cadres being trained (83% Females)	
	3.3	3.3.2 Ending epidemic Tuberculosis	Reduce the spreading of Tuberculosis	Collaboration with sub-district health agency for prevention, counselling and treatment of TBC patients 2022: 131 patients (45% F – 55% M) in Mendawai & Seranau. 2023: 19 patients (31% F– 69% M) in Batuah & Mentaya Sebrang.	Supported 4 villages governments in reducing the spread of tuberculosis.
	3.7	3.7.1 Proportion of women of reproductive age (aged 15–49 years) who have their need for family planning satisfied with modern methods	Raising awareness and attribute to healthy women concept, stop child marriage that link to stunting	Provided reproductive health services, family planning, and education: 631 women joined sessions on cervical cancer and anemia prevention in 4 subdistricts (2022). 732 students (15–18 years) educated on reproductive health, early marriage, and anemia prevention in Batuah, Ganepo, Mendawai, Terantang (2023).	Reached 1,300 women and girls with education on reproductive health, family planning, and wellbeing—promoting healthy lifestyles and preventing child marriage and stunting.
	3.8	3.8.1 Coverage of essential health services	Increases access to essential health services in remote areas, including primary care, prevention, and health education.	Pos Yandu Terapung (Boat Clinic) , in collaboration with the sub-district health agency. 36 visits to 11 remote villages around the project area that lack of healthcare facilities (2021-2023). 2,599 patients, 25% Male and 75% Female 4 MOUs with Health Agency in 4 villages (2023)	Increases access to essential health services in remote areas to about 2,600 people
	3.9	3.9.1 Mortality rate	Health education reduced ISPA cases in fire-	Health education for prevention of respiratory infection (ISPA) 2021: 746 participants 2022: 834 participants	Engaged around 1,600 people and reduced ISPA-related mortality in

		attributed to household and ambient air pollution	prone villages, contributing to lower mortality from household and ambient air pollution.		forest fire-prone areas through targeted health education.
		3.9.2 Mortality rate attributed to unsafe water, unsafe sanitation and lack of hygiene	Reduced river latrine use to improve water quality and prevent diseases from poor sanitation and hygiene.	- Removal of 189 river latrines improved water quality, reduced pollution, and promoted healthier living—contributing to lower mortality rates linked to unsafe water, poor sanitation, and hygiene. 626 community members (53% women) participated in WASH-related socialization and consultation sessions (2021–2023).	1,301 people participated in WASH health education, and 189 river latrines were removed—helping reduce disease and mortality from unsafe water, poor sanitation, and hygiene.
	3.b	3.b.1 Proportion of the target population covered by all vaccines included in their national programme	Contribute to reduce the death and spread-out out of COVID 19	COVID-19 Response (2021) 7,500 Vaccines for local communities, in collaboration with the local government, in 17 locations in Palangkaraya and Sampit, Central Kalimantan. - COVID-19 Response: Provision of masks, healthcare information, delivery of vaccines, test kits COVID test for staff and guests - COVID-19 Funding Support: For COVID 19 healthcare response	Contribution to reduce the death and spread-out out of COVID 19
Row No	SDG target	SDG Indicator	Net impact on SDG indicator	Current project contributions	Contributions over project lifetime
3		3.b.3 Proportion of health facilities that have a core set of relevant essential medicines available and affordable	Essential health services post-disaster event	Post-flood emergency response in Tumbang Bulan (2022): 92 people received free medical check-ups, in partnership with local authorities.	Contribution to Post-disaster emergency medical response

Row No.	SDG target	SDG indicator	Net impact on SDG indicator	Current project contributions	Contributions over project lifetime
4	4.2	4.2.1 Proportion of children aged 24–59 months who are developmentally on track in health, learning and psychosocial well-being	Contribute to early childhood health and learning	Tracked health of children under 5 through Posyandu, supporting local agencies with immunizations, breastfeeding, and nutrition to prevent disease and stunting. Supported 5 preschools in 5 villages to promote quality early education and healthy development through classroom renovations, teacher support, and educational supplies. PAUD Mendawai; Kelompok Bermain Tunas Telaga; TK Tunas Mekar Desa Jahanjang; TK Nurul Ilmiyah, Mentaya Sebrang; TK Bhayangkari, Sampit	Promote healthier living conditions for early childhood health and learning, essential for child development and long-term educational and societal benefits.
		4.2.2 Participation rate in organized learning (one year before the official primary entry age)			
	4.3	4.3.1 Participation rate of youth and adults in formal and non-formal education	A Non-Formal Education Program for underprivileged communities	Kejar Paket Program, educational equality in Seranau Zone - A Non-Formal Education Program for underprivileged communities who have dropped out or have not had the opportunity to attend formal education 241 local people join the program from 4 villages: Terantang, Terantang Hilir, Batuah dan Mentaya Seberang (2020-2023). 40 people received certificate (2021-2023), 78% are women, many of whom continue their studies or have entered the workforce, applying their practical skills in areas like food processing. 10 decent job for local tutors	Improve access to education, reduces inequality, and empowers underprivileged communities to participate more fully in society and economy.
	4.4	4.4.1 Proportion of youth for vocational skills	Increase knowledge of vocational students on TBTK/SMART Agriculture concept	Support 2 Agroecology Vocational School SMK Mendawai and Ambarwati	Lifetime skill for vocational students
	4.6	4.6.1 Proficiency in functional (a) literacy and (b) numeracy skills	Decreasing the number of people unable to read/write. Enhance teacher skill in math	Literacy and Numeracy for adults Calistung Program (2023): Reading, writing and calculating in Desa Mentaya Sebrang (age 31-50 years old) 3 Male 10 Female - Online training for elementary school teachers on the math method by the expert, participated by 70 teachers from 17 villages.	Math literacy provided for 13 communities and math skills training for 70 teachers from 17 villages.

Row No.	SDG target	SDG indicator	Net impact on SDG indicator	Current project contributions	Contributions over project lifetime
4	4.7	4.7.1 education for sustainable development are mainstreamed in (b) curricula; (c) teacher education	Increase understanding on sustainable development at school for student and teacher	Environment and Health Education Program (piloting project from 2018-2023) Integrated peat swamp forest conservation into school curricula, engaging students, teachers, and local education agencies at: - SDN Telaga, SDN SP 2 Babaluh, SDN Parigi, SDN 2 Babaluh - Education agencies in Katingan and Kotim Milestones 2018: Designed for elementary students to promote environmental awareness and healthy habits. 2019: Launched at SDN Telaga and SDN SP 2 Babaluh, involving 129 students with 6 behavior-focused sessions. 2020–2022: Expanded to SDN Parigi and SDN 2 Batuah, reaching 65 students; continued despite COVID-19. 2022: Reached 53 students at SDN 5 Bapinang Hulu; evaluation led to focus shift toward teacher training. 2023–2024: Launched <i>Pepohonan Program</i>—one-year teacher training pilot at SDN Parigi and SDN SP 2 Babaluh, involving 20 teachers. Key Outcomes Curriculum Integration: Two school modules incorporating local environmental knowledge were embedded into curricula, promoting conservation and forest-based education. Teacher Capacity Building: Pepohonan-trained teachers will mentor peers to expand environmental education. Student Awareness: Students engaged in projects on environmental and health education topics.	Developed a conservation module integrating local environmental knowledge into school curricula—serving as a model for forest-based education.
	4.7	4.7.1 education for sustainable development are mainstreamed in (b) curricula; (c) teacher education	Increase understanding on sustainable development at school for student and teacher	Education for Sustainable Development Promotes health, hygiene, and waste management education to empower students to protect their well-being and the environment—preparing them for a more sustainable future.. - Program for elementary schools - Program for junior and senior high schools (SMPN 5 & 6 Mentaya Seberang; SMA PGRI 2 Terantang)	

Row No.	SDG target	SDG indicator	Net impact on SDG indicator	Current project contributions	Contributions over project lifetime
4	4.a	4.a.1 Proportion of schools offering basic services, effective learning environment	Provide basic services at school in remote area	Basic services Support: Sanitation and Handwashing Facilities 4 units of Sanitation/Toilets: SDN 2 Batuah; SDN 6 Mentaya Seberang (3 units). 1 Waste Disposal Site: SDN 5 Hanaut. 17 Handwashing Facilities: spread out in SDN SP 2 Babaluh, SDN 2 Batuah, Telaga, Perigi; SDN Makarti Jaya Library: Galinggang village library Parigi book corners Taman Baca Kemala Mentaya Sebrang 2 Boat Schools (crossing Katingan River) - Kampung Melayu: 60 students - Tampelas: SMA and SMP (110 students), SMKN Kamipang (80 students).	Provide basic services at school in remote area
	4.b	4.b.1 Assistance for scholarships	increase access to education, reduce inequality,	Scholarships for staff children: 8 Girls 1 Boy (Junior and high school, from 2019-2023) Kejar Paket Program, educational equality in Seranau Zone - A Non-Formal Education Program for underprivileged communities who have dropped out or have not had the opportunity to attend formal education 241 local people join the program from 4 villages. 40 people received certificate (2021-2023), 78% are women, many of whom continue their studies or have entered the workforce, applying their practical skills in areas like food processing. Other educational support and skill improvement 2020-2023: 81 researchers are engaged (67% Male; 33% Female). 21 Internship support for students (52% Male; 48% Female). 422 proposal related to education was supported. - Internship Camp Conservation for Master Students 67 teachers get educational training (34% Male; 66% Female). 152 people-76 % male, 24% female-received training and workshops to strengthen local institutions (village institutions, customary institutions, BUMDes). - Education Material for school, community and village government. (list of education material is available).	increase access to education, reduce inequality, and empower students/adult, fostering academic achievement and contributing to community and economic development.

Row No	SDG target	SDG indicator	Net impact on SDG indicator	Current project contributions	Contributions over project lifetime
5	5.1	5.1.1 Promote, enforce and monitor equality and non-discrimination on the basis of sex	Equal chance for women	End discrimination against women and girls - In-house regulations (SOP), the project promotes gender equality and non-discrimination based on sex. - Supports women's empowerment by providing capacity-building, value-added opportunities, marketing skills, and livelihood improvement, particularly through small-scale enterprises that generate income for women, such as microfinance program for woman group in Mendawai village. - Access to basic healthcare, reproductive health services, to further support women's well-being. - Training for cadre Health assistant. - Business opportunities for women, including rattan weaving and the production of biodegradable fiber bags for tree nurseries. 20,000 fibre bags have been produced by women in 4 villages, to replace the use of plastic polybag in the nursery.	Equal chance and empower women, enabled them to strengthen their economic independence and well-being that positively impact their community.
	5.3	5.3.1 Reduced Women married before age 18	Raising awareness on reproductive health and reduce child marriage	Health and education program to reduce child, early and forced marriage 732 students at aged 15 to 18 participated in the Education on Female Reproductive Health program across 4 villages in 2023. - Awareness raising/education for prevention of early marriage in 4 villages: Batuah, Ganepo, Mendawai, Terantang.	Central Kalimantan faces high child marriage and stunting rates. The project supports local government through education and advocacy on reproductive health and reducing child marriage linked to stunting.
	5.5	5.5.2 Proportion of women in managerial positions, women leadership in economic	Enabled women to strengthen their economic independence and positively impact their community.	Women's participation and equal opportunities 11 Women Group, with 83 active members, in Mendawai village. Woman-led Cottage Industries 2021: Bawi Mentaya in Hantipan village. Skill enhancement, technical assistance, and asset support by the project to expanded their Virgin Coconut Oil (VCO) production.	Empower women through a microfinance program, helping lift them out of poverty and fostering economic growth.
	5.6	5.6.1 Proportion of women aged 15–49 years who make	Raising awareness on reproductive health, reduce child marriage	Reproductive healthcare services, family planning, information and education – same with SDG Target 3.7.1 and 5.3.1 631 Female attended education for Healthy Women, Prevent Early Cervical Cancer and Anaemia, in Cempaga, Kamipang, Seranau, and Pulau Hanaut (2022). 732 students aged 15 to 18 participated educations on female reproductive health; prevention of early marriage, prevalence of	Central Kalimantan faces high child marriage and stunting rates. The project supports local government through education and advocacy

		their own informed decisions regarding sexual relations, contraceptive use and reproductive health care	and its relation with stunting	anaemia in women aged 15 to 18 years old, in Batuah, Ganepo, Mendawai, Terantang villages (2023).	on reproductive health and reducing child marriage linked to stunting.
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Row No	SDG target	SDG indicator	Net impact on SDG indicator	Current project contributions	Contributions over project lifetime
6	6.1	6.1.1 Proportion of population using safely managed drinking water services.	Provide access to clean water	Safe Drinking Water Access - Installed 20 drilled wells to provide clean groundwater for Bamadu communities. - Solar-powered water supply system established in Karuing (2019–2022). - Clean water access improved in Satiruk village.	Enhance quality of life by having access to clean water
	6.2	6.2.1 Proportion of population using (a) safely managed sanitation services and (b) a hand-washing facility	Healthier living condition and provide proper sanitation and hygiene.	River Latrine Removal program, to prevent water pollution and promote healthier living conditions. 189 River Latrine removal in 12 villages (2019-2023) 4 Toilet construction at schools 17 unit Hand Washing facilities for primary school 5 unit Hand Washing for Pos Yandu (Health care Pos) 626 communities participated in socialisation and consultation related to the WASH program (2021-2023) (53% attended by Female).	Healthier living condition by removing river latrines and encouraging proper sanitation and hygiene.
	6.3	6.3.1 Proportion of domestic and industrial wastewater flows safely treated	Contribute to reduce soil and water pollution cause by domestic operational.	- SOP for domestic wastewater to prevent water pollution - SOP for toxic and hazardous waste to prevent soil and water pollution - Education for environmental mainstreaming into local school module and curricula, promotes sustainable development by educate students essential health, hygiene, waste management practices. Empowers them to protect their health, prevent illness, and safeguard the environment, preparing them to contribute to a healthier and more sustainable future.	Reduce soil and water pollution from domestic wastewater, toxic and hazardous waste.
		6.3.2 Proportion of bodies of water with good	Healthier living conditions and keep ambient local river water quality.	Replaced river latrines to improve water quality, reduce contamination, and promote healthier living—supporting SDG 6.6 (water ecosystem protection) and SDG 14.1 (pollution reduction).	The river latrine removal program improves community well-being, reduces pollution, and enhances water quality.

		ambient water quality			
	6.6	6.6.1 Change in the extent of water-related ecosystems over time	Enhance water ecosystems by protecting peatlands and latrine removal program	- Restoring peatlands—covering 90% of the project area—supports water ecosystem health by improving water quality, preserving natural sources, and increasing carbon storage. - Removing river latrines enhances water quality, reduces pollution, and improves community well-being.	Protect peatland ecosystem

Row No.	SDG target	SDG indicator	Net impact on SDG indicator	Current project contributions	Contributions over project lifetime
7	7b	7.b.1 Installed renewable energy-generating capacity in developing countries (in watts per capita)	Enhancing access to clean energy	Installation solar panel in Karuing village, to support clean water supply in 2020-2022. • 6 units of 250-volt solar panels • 8 units of 300-watt solar panels Tampelas Project (since 2022) • Designed solar power system for albumin factory, households, and public facilities. • 125 people (56% male, 46% female) joined consultations. • Installed 29 solar panel units. • Built a multipurpose room and solar-powered albumin small-scale factory. 16 Katingan Mentaya Post Guard supported by solar panel	Enhancing access to clean energy, reducing carbon intensity while improve livelihood and access to clean water

Row No.	SDG target	SDG indicator	Net impact on SDG indicator	Current project contributions	Contributions over project lifetime
8	8.2	8.2.1 Annual growth GDP per employed person	Economic growth contribution	Create formal and informal jobs	Create formal and informal jobs
	8.3	8.3.1 Proportion of informal employment. Support productive activities, decent job creation, entrepreneurship, creativity and encourage the formalization and growth of micro-, small-and medium-sized enterprises.	Enhancing economic productivity in sustainable way	Community Business Support Promotes sustainable local economies by helping individuals, women's groups, and farmers develop income sources through training, resources, and market access. • Coconut Sugar Farmers: Trained (2018–2019); ongoing sales to Mentaya Sweet and independent markets. • Bawi Mentaya: Women's group producing VCO and soap; supported with skills, mentorship, and consignment (2019–2023). • Banana Farmers: Received 1,000–2,000 seedlings and land support; harvests purchased by Mentaya Sweet. • Ganepo Women's Group: Received tools, kitchen upgrades, and permits for banana chip production. • Seragam Jaya: Provided equipment and packaging for dried spices and pineapple syrup. Beneficiaries: • Agroforestry: 60 farmers in Terantang Hilir cultivating diverse crops. • Pineapple Farmers: 2 farmers in Seragam Jaya. • VCO Producers: 5 producers in Hantipan. • Banana Farmers: 27 farmers across Terantang Hilir, Ganepo, Bapinang Hilir Laut, Satiruk, and surrounding areas. • Coconut Sugar Producers: 73 producers in Basawang, Satiruk, and Serambut. • Lemongrass Farmers in Lemiring: 21 farmers in Ganepo cultivating lemongrass. Strengthening the Institutional Capacity of BumDes (Village-Owned Enterprises) in Serambut and Tampelas (2023) • Strengthening through participatory approaches • Obtained formal legal recognition from the Ministry of Law and Human Rights • Conducted village deliberations for participatory accountability reporting • Developed 2 BumDes Guide Book: Facilitation Guide for BumDes and Participatory Money	Supports home-based businesses and micro enterprises to boost income and promote sustainable livelihoods.

Row No	SDG target	SDG indicator	Net impact on SDG indicator	Current project contributions	Contributions over project lifetime
8	8.3	8.3.1 Proportion of informal employment. Support productive activities, decent job creation, entrepreneurship, creativity and encourage the formalization and growth of micro-, small- and medium-sized enterprises.	Enhancing economic productivity in sustainable way	Livelihood Transition Pilot – Pulau Hanaut Zone To reduce illegal logging and promote forest protection, nine former loggers from Satiruk and Bamadu joined a transition program with RMU-Katingan Mentaya in 2022. In 2023, they received awareness training, financial literacy, livelihood options, capital support, and regular monitoring. Outcome • 9 loggers ceased activity, securing two key logging routes in Satiruk. • 6 transitioned to sustainable livelihoods; three are still adapting.	Drive economic growth by fostering job creation and promoting sustainable micro sized enterprises as an alternative livelihood for former illegal loggers.

Row No	SDG target	SDG indicator	Net impact on SDG indicator	Current project contributions	Contributions over project lifetime
8	8.5	8.5.1 Average hourly earnings of employees	Provide decent average hourly earnings, and equitable wages with fair compensation		Drive economic growth by fostering job creation

Row No	SDG target	SDG indicator	Net impact on SDG indicator	Current project contributions	Contributions over project lifetime
8	8.8	8.8.1 Fatal and non-fatal occupational injuries	Create a safe working environment	Health Safety and Environment and Security (HSES) Worker safety is a top priority. The project ensures a safe, healthy work environment and complies with Indonesia's labor law (UU No. 13/2003). Since 2023, RMU has independently implemented an Occupational Health and Safety (OHS) system. The following measures support on-the-ground activities: 5 certified as OHS Experts (AK3U). 40 safety SOP, internal audit, training, reporting, monitoring, procurement of HSE-related equipment, safety induction, coordination, partnership, and internal audit for HSES. - HSE tools and supplies for staff protection at work: Safety helmet, safety mask, safety shoes - Ear protection (ear muff), safety goggles, safety gloves, full body harness, safety vest, and life jacket. - HSE Induction, Briefing and Training to reduce accidents at work. - HSE inspection, stakeholder coordination, partnership and monitoring. - Commissioning water transportation (boat), enabling safe crossings of the rivers and linking canals for project staff and community members. 0 Fatal Injuries (2020-2023) Non-fatal Injuries: Light injury at arm and legs, non-fatal motorcycle accident, burning Stove, arm Burns, eyes injured, Stink by the Bees, Block Fall, Hit by machete, Light injury at foreheads, Broken Tooth, Injured Eyes, Slip, Faint, Property Damage, Property Lost.	Safe and secure working environment that compliant with Indonesia's labour law, no fatal injuries and an OHS system in place.

	2020	2021	2022	2023
Induction at work (People)	175 89% M 11% F	390 81% M 19% F	651 78% M 22% F	290 76% M 24% F
Briefing at work	232 100% M	635 99% M 1% F	1,110 99% M 1% F	582 98% M 2% F
Staff Training	31 80% M 20% F	87 87% M 13% F	369 70% M 30% F	113 71% M 29% F

Row No.	SDG target	SDG indicator	Net impact on SDG indicator	Current project contributions	Contributions over project lifetime
9	9.5	9.5.1 Research and development	Research and development based on lessons learned from peatland restoration project.	Research, Collaboration, Technologies Used and Innovation 2020-2023: 64 researchers are engaged (75% Male; 25% Female) 31 Research and Collaboration. 8 MOUs with University and Research Agency - Peatland Analysis (A. Hooijer, R. Vernimmen, CEH): This includes technical and bibliographical evaluations of peat characteristics (e.g., DEM, peat thickness, emission factors) and updates of stratification and emission factors for the project. - Chloris Geospatial: Provides high-resolution Above-Ground Biomass (AGB) and forest condition data for accurate forest carbon stock estimations. - Orora Technologies: enables real-time and historical monitoring of forest fires and disturbances. - Planet: Offers high-resolution, near-real-time multispectral optical satellite data for continuous forest monitoring, critical for early warnings and rapid responses to disturbances. - NASA-FIRMS: Provides near-real-time fire hotspot detection, serving as a secondary system alongside OroraTech. - Google Earth Engine: Facilitates GIS data management and analysis. - ArcGIS: Supports data analysis and mapping for project monitoring. - OnPoz GNSS Software: This software is used for high-accuracy mapping during field-plot campaigns.	Advancing Research, Collaboration, Technologies Used and Innovation, enhance scientific research based on lessons learned from peatland restoration project.

Row No.	SDG target	SDG indicator	Net impact on SDG indicator	Current project contributions	Contributions over project lifetime
10	10.2	Empower and promote the social, economic and political inclusion	Reducing inequalities and fostering better opportunities	- Improves access to education (formal and non-formal education) and livelihoods for underserved communities through non-formal learning and skills training in entrepreneurship, climate-smart farming, reforestation, and agroforestry—reducing inequality, empowers underprivileged communities to participate more fully in society and economy, that supporting local economic development. Non formal education in Seranau Zone 241 local people joined the program. 40 local people received certificates (2021–2023), 78% of them women. - Created 10 decent jobs for local tutors. Women's participation and equal opportunities (SDG 5.5.2) - Empowering Women Through Microfinance: Lifting them out of poverty and creating wealth. 11 Women Group, with 83 active members, in Mendawai village. - Woman-led Cottage Industries - Bawi Mentaya in Hantipan village. Skill enhancement, technical assistance, and asset support by the project to expanded their Virgin Coconut Oil (VCO) production. Enhancing economic productivity (SDG 8.3.1) - Provide decent average hourly earnings, and equitable wages with fair compensation (8.5.1)	40 people received certificate; improves skill, create decent job

Row No.	SDG target	SDG indicator	Net impact on SDG indicator	Current project contributions	Contributions over project lifetime
11	11.4	11.4.1 Preservation, protection and conservation of cultural and natural heritage	Preservation of natural heritage and local cultural	Creating Inclusive, Safe, Resilient, and Sustainable Communities • Forest Conservation: Protects 157,875 ha of peat swamp forest, preserving biodiversity, preventing deforestation and fires, and supporting indigenous communities. • Sustainable Practices: Promotes eco-friendly livelihoods to replace slash-and-burn farming. • Advocacy & Awareness: Builds public awareness on habitat and environmental protection. • Cultural Preservation: Supports Dayak traditions, local music groups, customary institutions, and traditional leaders. • Community Campaigns: Promotes green living through initiatives like <i>Birukan Langit</i>, <i>Journey to Zero</i>, and <i>Satiruk Clean-up Day</i>.	Preservation of natural heritage and local cultural, active campaign for low emission life style
	11.6	11.6.2 Reduce fine particulate matter in the cities.	Enhances carbon sequestration contribute to air quality	• Carbon Credit Generation: Produces 7.5 million carbon credits annually, mitigating urban heat, improving air quality, and fostering rural and urban sustainability through forest conservation and ecosystem restoration. • Pollution Reduction: NO forest fire impacting better air quality for human health, promote no-fires and chemical input for land clearing improving air quality. • Water Quality Improvement: Replaces river latrines in upstream areas, preventing pollution, enhancing health, and ensuring clean water flows to downstream cities. Enhance carbon sequestration reduces air pollution by absorbing CO₂: • 1,661 hectares planted, increase carbon absorption. • 55,363 hectares of natural succession restore ecosystems that capture CO₂. • 325,176 seedlings contribute to long-term carbon sequestration, reducing greenhouse gases and improving air quality.	Enhance carbon sequestration and reduce greenhouse gas emissions, contributing to improved air quality and benefiting both human and environmental health.

Row No.	SDG target	SDG indicator	Net impact on SDG indicator	Current project contributions	Contributions over project lifetime
12	12.8	12.8.1 Extent to which (i) global citizenship education and (ii) education for sustainable development are mainstreamed in (a) national education policies; (b) curricula; (c) teacher education; and (d) student assessment	Raising awareness and promoting sustainable education.	• School Environment Education Program for teachers and students: raising awareness and promoting sustainable practices by teaching health, hygiene, and waste management. Empowering students and teachers to promote sustainable living and environmental stewardship in their communities. • Waste Program: Trains staff on waste management and provides trash bins to local schools, fostering responsible waste practices. • Community-based environmental-friendly economic activities: Promotes climate-smart agriculture, eco-tourism, and sustainable crafts such as purun weaving, production of biodegradable polybags, encouraging eco-friendly livelihoods in harmony with nature. SDG Training for Project Staff Members (2021-2023) • 287 staff were trained, and in-person consultations were conducted on integrating SDG into SIRETA data management (53% male, 47% female).	Promote education for sustainable development and its practices among teachers, students, communities, and staff. Integrate locally contextualized modules on peatland restoration into local curricula.
	12.a	12.a.1 Installed renewable energy-generating capacity in developing countries	Renewable energy used.	Tampelas Project 2022 • Planning design for the solar panel for albumin small-scale factory, households, and public facilities. • 125 people (56% Male, 46% Female) attended socialization and consultation related to the solar panel project. 2023 • 29 Unit Solar Panel installation • Benefiting for 455 Tampelas people (53% Male, 47% Female). • Construction of multipurpose room and albumin small-scale factory powered by solar panels. • Socialization and consultation related to the solar panel project were attended by 39 people (85% Male, 15% Female). 16 Katingan Mentaya Post Guard supported by solar panel	Renewable energy used for community and to support albumin small-scale factory.

Row No.	SDG target	SDG indicator	Net impact on SDG indicator	Current project contributions	Contributions over project lifetime
13	13.2	13.2.1 Nationally determined contributions, long-term strategies, national adaptation plans and adaptation communications	Climate Action, Contributes to Indonesia (NDC)	- The project contributes to Indonesia's Nationally Determined Contributions (NDC). - The project contributes to the UNFCCC's goal of stabilising GHG concentrations by protecting the peatland forest ecosystem and preventing emissions from planned deforestation for acacia plantations. - Generates 7.5 million triple-gold-certified carbon credits annually through restoration and forest conservation efforts.	17,357,446 tonnes CO₂e net estimated emission reductions in the project area during 2021-2023 55,306,737 tonnes CO₂e net estimated emission reductions during project life time
		13.2.2 Total greenhouse gas emissions per year			
	13.3	13.3.1 Extent to which (i) global citizenship education and (ii) education for sustainable development are mainstreamed in (a) national education policies; (b) curricula; (c) teacher education ; and (d) student assessment	Climate Action, raising awareness and promoting sustainable practices	Environment Education Program: raising awareness and promoting sustainable practices by teaching health, hygiene, and waste management, empowering students and teachers to promote sustainable living and environmental stewardship in their communities, mainstreaming into local curricula. Piloting project in 21 local schools. Education and Awareness Raising: Community outreach for forest fire prevention and impact of forest fires on health. Institutional Capacity: Strengthening 44 local institutions, including Community Fire Management, LPHD, Community Health Group (Pos Yandu), Community Training: Capacity building for Community Fire Management (MPA/RSA).	Climate Action on the ground, zero forest fires for the last 3 years
			Forest prevention effort and enhance carbon sequestration	Forest Fire Prevention: - Regular internal and external patrols (joint forest patrols) to protect forests from illegal hunting, logging, and fires. - Mobilisation of Forest Rangers. Fire Management (MPA/RSA) from 33 villages. 546 community trained as Fire Fighting Teams; 2,028 people are involved in awareness programs and focus group discussions on forest fire prevention. - Signage and Campaigns: Installation of "No Burning," "No Logging," and "No Hunting" signs and awareness campaigns. - Core, Support, and Assistance Firefighting Teams: Trained for forest fire response. - SOPs and Equipment: SOP and Fire prevention and control equipment. Early Detection Systems: Satellite Data: Utilizing various sources of hotspot information, including satellite data from Orora Tech, NASA, VIIRS (NOAA, SUOMI NPP), MODIS (Aqua, Terra), SIPONGI, LAPAN Fire Hotspot, and BRIN Hotspot. Hotspot alerts via SMS. Community Reports: Community radio system, local hotspot reports. - Drone monitoring. Enhance carbon sequestration:	Climate Action on the ground, zero forest fires for the last 3 years

				• 1,661 hectares of land have been planted since 2016. • 55,363 ha natural succession • 671,523 seedlings planted since 2016 • 2 community-based nurseries: Babirah and Serambut with a capacity 70,000 seedlings annually • Nursery: Hantipan, Handil Limin, with a capacity 150,000 seedlings annually Infrastructure to support forest fire prevention (since 2015) • 12 Post Guard; 5 field office; 3 shelters • 351 drilled well 178 shallow wells 115,050m of firebreaks • 80 canals blocking also aims for rewetting peatland from drying and decomposition to avoid releasing of GHG. 18 spillways to maintain the water table and prevent peatland loss.	
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Row No.	SDG target	SDG indicator	Net impact on SDG indicator	Current project contributions	Contributions over project lifetime
14	14.2	14.2.1 Ecosystem-based approaches to managing marine areas	Contribute to reducing land-based pollutants in rivers and coastal areas.	Reducing Marine Pollution from Land-Based Activities Project efforts help protect ocean health by minimizing land-based pollution, reducing marine debris, and preventing nutrient runoff: • Peatland Restoration: Restores degraded peatlands, preventing erosion and nutrient runoff into rivers, which reduces marine pollution. • River Latrine Removal: Removed 213 river latrines in 12 villages (2019–2023), improving sanitation, water quality, and reducing nutrient discharge into aquatic ecosystems. • Environmental Education: Educates schoolchildren on waste management and hygiene to reduce plastic and household waste entering rivers. • Healthier Communities: Improved sanitation benefits women and elders, while supporting cleaner water and safer environments.	Reducing land-based pollutants in rivers and coastal areas.

Row No.	SDG target	SDG indicator	Net impact on SDG indicator	Current project contributions	Contributions over project lifetime
15	15.2	15.2.1 Progress towards sustainable forest management	Implementati on of sustainable forest management	Implementation of sustainable forest management 157,875 hectares of peatland forest under protection, contributing to biomass conservation within the forest area and safeguarding biological diversity. - Protect and restore peatland forests rich in carbon Stocks, a habitat for key species flora and fauna.	Implementation of sustainable forest management
	15.3	15.3.1 Proportion of land that is degraded over total land area	Increase afforestation and reforestation	Restore degraded forests and increase afforestation and reforestation 1,661 hectares of degraded land have been restored through planting since 2016. 55,363 hectares undergoing natural succession, aiding in the restoration of ecosystem functions. 671,523 seedlings planted since 2016 to regenerate and promote sustainable forest cover.	Increase afforestation and reforestation through restoration activities
	15.5	15.5.1 Red List Index	HCV protection	Protecting species of High Conservation Value in the project area (2020-2023) Plant: TREE SPECIES 25 RTE 100 non-RTE 3 CR 5 EN 8 VU 0 CITES App1 1 CITES App2 0 Nationally Protected 9 Endemic Borneo NON-TREE SPECIES 3 RTE 83 non-RTE 0 CR 0 EN 0 VU 0 CITES App1 3 CITES App2 0 Nationally Protected 0 Endemic Borneo - RTE: Rare Threatened - Endangered-Endemic - CR: Critically Endangered species - EN: Endangered species - VU: Vulnerable species ANIMALS MAMMALS SPECIES 41 RTE 32 non-RTE 2 CR 8 EN 18 VU 11 CITES App1 17 CITES App2 21 Nationally Protected 11 Endemic Borneo 0 Migratory BIRD SPECIES 78 RTE 177 non-RTE 2 CR 7 EN 14 VU 2 CITES App1 31 CITES App2 60 Nationally Protected 4 Endemic Borneo 31 Migratory	HCV protection in project area

15	15.5	15.5.1 Red List Index	HCV protection	HERPETOFAUNA • 17 RTE • 64 non-RTE • 1 CR • 2 EN • 5 VU • 2 CITES App1 • 10 CITES App2 • 3 Nationally Protected • 5 Endemic Borneo • 0 Migratory FISH SPECIES • 30 RTE • 148 non-RTE • 0 CR • 3 EN • 13 VU • 1 CITES App1 • 0 CITES App2 • 3 Nationally Protected • 20 Endemic Borneo • 0 Migratory	HCV protection in project area
				Protect and prevent the extinction of threatened species Survey efforts conducted from 2020 to 2023 to protect high conservation value species within the Project area. TRANSEK Orangutan • 12 Sampling blocks • 48 @2km transects • 248 km walked in total conducted surveys • 2,396 number of nests found • 10 nests/km surveyed • 1,52 number of individuals - Orangutan/km² • 1,691-2,556 Fauna • 9 Locations sampling blocks • 36 Transect, @2km transects • 200 km walked • 135 species found • 3,254 individuals found Ad hoc • 146 number of	
				CAMERA TRAPS • 247 units of camera installed • 70,449 total trap days • 51,488 effective trap days • 6 @80-sq km sampling blocks • 120 locations surveyed – Grid 2x2-km cells • 412 locations surveyed – Grid 1x1-km cells • 570 locations surveyed – sampling stations PATROL EFFORT Fire prevention • 935 forest fire monitoring patrols • 2,110 people involved in patrols Illegal logging and other threats • 294 illegal logging patrols • 371 people involved	

Row No.	SDG target	SDG indicator	Net impact on SDG indicator	Current project contributions	Contributions over project lifetime															
15	15.c	15.c.1 Proportion of traded wildlife that was poached or illicitly trafficked	HCV protection	End poaching and trafficking of protected species of flora and fauna HUNTING & UTILIZATION Monitoring (2021-2023) 31 village surveyed 160 respondents surveyed 75 hunters identified 3 species identified and targeted for hunting (sambar deer, sunda pangolin, bornean yellow) To end wildlife poaching and illegal logging Capacity Building: Camera Trap training for LPHD Tampelas (2021) Local Community Involvement in project activities Livelihood Transition: Combating Illegal logging through livelihood transition in Pulau Hanaut Zone. Community Business Support: Business Development Program, Social Forestry Program, STA. Awareness Raising and Education: Conduct awareness raising sessions in villages and environmental education at school. Construction of Guard Posts: Establishing posts for monitoring. Selective Entry Screening: Being more selective with individuals entering the Protected Area (PA) through guard posts; if tools for hunting are identified, guards at the posts will inform them of the regulations. Local Community Involvement in project activities <table><tr><th>Decent Job (People)</th><th>2020</th><th>2021</th><th>2022</th><th>2023</th></tr><tr><td>Biodiversity Protection</td><td>96 99% M 1% F</td><td>54 100% M</td><td>146 96% M 4% F</td><td>156 90% M 10% F</td></tr><tr><td>Illegal Logging & Poaching prevention</td><td>82 100% M</td><td>99 p 97% M 3% F</td><td>83 96% M 4% F</td><td>24 92% M 8% F</td></tr></table>	Decent Job (People)	2020	2021	2022	2023	Biodiversity Protection	96 99% M 1% F	54 100% M	146 96% M 4% F	156 90% M 10% F	Illegal Logging & Poaching prevention	82 100% M	99 p 97% M 3% F	83 96% M 4% F	24 92% M 8% F	HCV protection in project area
Decent Job (People)	2020	2021	2022	2023																
Biodiversity Protection	96 99% M 1% F	54 100% M	146 96% M 4% F	156 90% M 10% F																
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Row No.	SDG target	SDG indicator	Net impact on SDG indicator	Current project contributions	Contributions over project lifetime
16	16.5	16.5.2 Reduce bribery in business	Avoid bribery by Implementing anti-bribery regulations	- Company regulation for anti-bribery and corruption with clear sanction. - SOP; monitoring and evaluation for implementation MOU and partnership agreement with project partners.	Support good governance, enhance, and builds trust
	16.6	Develop effective, accountable and transparent institutions	Implementing accountable and transparent institutions enhances transparency, and builds trust	Accountable and Transparent Institutions - The project applies a 6-zone management approach to ensure forest management is effective and responsive to community needs. - Uses a transparent FPIC process to engage women, youth, customary groups, and minorities in decision-making. MOUs are signed by community representatives to confirm consent. - Ensures participatory monitoring and regular stakeholder communication. - Subject to third-party audits (Verra and financial), with reports publicly available. GRM cases are handled promptly. 2020: 15 GRM cases, all resolved 2021: 6 GRM cases, all resolved 2022: No GRM cases 2023: 4 GRM cases, all resolved; 3 dispute cases, all resolved 2024: 2 GRM cases, all resolved (as per May 2024) Stronger Institution - RMU is certified B Corporation, upholds high standards benefiting communities, employees, buyers, and the environment. 6-zone management makes forest management more relevant and effective in meeting real needs. Independent Oversight: Projects are monitored, verified, and reported by third parties, with results publicly accessible. Regulatory Compliance: RMU adheres to tax, carbon levy, statutory, and labour regulations. SIRETA Tool: Ensures transparency, accountability, and alignment with SDG targets through activity and budget monitoring. Efficient Resource Management: An integrated system streamlines financial, administrative, and procurement processes for effective project delivery.	Stronger institutions with effective, accountable, and transparent
16	16.7	16.7.2 Inclusive and responsive decision-making	Enhance participatory decision-making process	Inclusive and participatory decision-making process - The project works with 34 villages under MOUs, and 6 sub-districts (as of 2023), fostering collaboration and strengthening local institutions. - All agreements and activities follow a transparent FPIC process guided by a standard SOP for community engagement—ensuring the meaningful inclusion of women, youth, indigenous peoples, religious and community leaders, and minority groups. - Community representatives sign MOUs to confirm consent and participation. - Participatory mapping helps clarify boundaries and prevent land disputes. Supported 11 Village Forest Management Units (LPHDs) in securing legal tenure using inclusive and transparent FPIC processes involving third-party facilitators. - The 6-zone management approach promotes inclusive decision-making tailored to local needs, enabling communities to co-create solutions relevant to their specific challenges and opportunities.	Inclusive and participatory decision-making process

				Held 904 community meetings (2020–2023), attended by 28,516 people (11,445 men; 17,071 women), covering topics from agroforestry and public health to fire prevention, social forestry, and WASH—ensuring broad stakeholder engagement at every step.	
	16.10	16.10.2 public access to information	Enhance transparency	Public Information Access - Project reports are publicly available through Verra and the project website. - Project Activities include posting on social media such as Instagram, Facebook, and LinkedIn, scientific journals, local and international media, and the project office/camp/village office, with which the project has an MOU.	Information for all

Row No.	SDG target	SDG indicator	Net impact on SDG indicator	Current project contributions	Contributions over project lifetime																														
17	17.9	17.9.1 financial and technical assistances to support implementation of SDG	Develop community skills for self-reliance and climate change adaptation.	Building capacities in sustainable livelihoods, biodiversity conservation, and resource ownership. This enhances local self-reliance, strengthens community climate resilience, and fosters long-term stewardship of natural resources, contributing to sustainable development goals. Key Capacity-Building Areas: to improve community livelihoods, Biodiversity to achieve community climate resilience Stronger community ownership of sustainable resources. • Agroforestry: Train communities in combining tree planting with crops to boost biodiversity and resilience. • Aquaculture & Fisheries: Promote sustainable fish farming and harvesting practices. • Ecotourism: Build skills for managing ecotourism to link conservation with income. • Education & Culture: Foster environmental awareness and preserve local knowledge. • Fire Management: Train in fire prevention, early detection, and suppression. • Livestock: Encourage eco-friendly and productive livestock methods. • NTFPs: Teach sustainable harvesting and value-added processing of forest products. • Public Health: Strengthen health resilience in restoration areas. • Reforestation: Educate on tree planting and native species use for biodiversity. • SMEs: Support green entrepreneurship with technical and financial tools. • Social Forestry: Empower communities to manage forests sustainably. • Local Institutions: Enhance governance for effective ecosystem management. Training for Communities Provided training to local communities and institutions in agroforestry, aquaculture, ecotourism, education, fire prevention, livestock, NTFPs, public health, reforestation, SMEs, social forestry, and institutional strengthening. <table><tr><th>Year</th><th>Participants</th><th>M</th><th>F</th><th>No of Training</th></tr><tr><td>2020</td><td>357</td><td>178</td><td>179</td><td>26</td></tr><tr><td>2021</td><td>662</td><td>422</td><td>240</td><td>29</td></tr><tr><td>2022</td><td>620</td><td>448</td><td>172</td><td>42</td></tr><tr><td>2023</td><td>725</td><td>415</td><td>310</td><td>46</td></tr><tr><td></td><td>2,364</td><td>1,463</td><td>901</td><td>143</td></tr></table>	Year	Participants	M	F	No of Training	2020	357	178	179	26	2021	662	422	240	29	2022	620	448	172	42	2023	725	415	310	46		2,364	1,463	901	143	Building skills in livelihoods, biodiversity conservation, and resource management enables communities to become self-reliant, adapt to climate change, and use resources sustainably.
Year	Participants	M	F	No of Training																															
2020	357	178	179	26																															
2021	662	422	240	29																															
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2023	725	415	310	46																															
	2,364	1,463	901	143																															

17	17.9	17.9.1 financial and technical assistances to support implement ation of SDG	SDG implementation	Capacity Building and Technical Assistant: Basic skills, Biodiversity, Carbon MRV, Conflict mediation, Data and Information Management, Fire prevention and suppression, HSES, Participatory planning, Reforestation, and SDG. <table><tr><th>Year</th><th>Participants</th><th>M</th><th>F</th></tr><tr><td>2020</td><td>390</td><td>291</td><td>99</td></tr><tr><td>2021</td><td>628</td><td>516</td><td>112</td></tr><tr><td>2022</td><td>438</td><td>374</td><td>64</td></tr><tr><td>2023</td><td>1,088</td><td>849</td><td>239</td></tr><tr><td></td><td>2,544</td><td>2,030</td><td>514</td></tr></table> Strengthening 44 local institutions.	Year	Participants	M	F	2020	390	291	99	2021	628	516	112	2022	438	374	64	2023	1,088	849	239		2,544	2,030	514	building skills enables communities to become self- reliant, adapt to climate change, and use resources sustainably.
Year	Participants	M	F																										
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Row No.	SDG target	SDG indicator	Net impact on SDG indicator	Current project contributions	Contributions over project lifetime															
17	17.14	17.14.1 Policy coherence of sustainable development	Project mechanisms in place to enhance policy coherence of sustainable development	Policy Coherence of Sustainable Development The project aligns Climate, Community, and Biodiversity (CCB) goals with broader economic, social, and environmental objectives. By integrating carbon reduction with sustainable development, it supports national and global SDG targets and policies. Key Strategies • Climate: Mitigate climate change through reforestation and conservation, aligned with national strategies (SDG 13). • Community: Promote stakeholder participation, job creation, and resource management to ensure social inclusion (SDGs 1, 8, 10). • Biodiversity: Protect habitats and endangered species, supporting national biodiversity plans (SDG 15).	SDG targets are integrated into project implementation.															
	17.16	17.16.1 Monitoring frameworks that support the SDGs achievement	Implement SDG Monitoring frameworks	Monitoring frameworks • SIRETA tracks activity progress, budgets, and SDG targets, offering real-time data, early warnings, and report links for transparency. • Supports data-driven decisions and prepares key reports like MRV and project updates. • Integrated Budget Management System ensures efficient financial, administrative, and procurement processes.	SDG monitoring frameworks are integrated into project implementation.															
	17.16.	17.16.1 Monitoring frameworks that support the SDGs achievement	Implement SDG Monitoring frameworks	Training SDG for staff <table><tr><th>Year</th><th>Participants</th><th>M</th><th>F</th></tr><tr><td>2022</td><td>107</td><td>70</td><td>37</td></tr><tr><td>2023</td><td>170</td><td>84</td><td>86</td></tr><tr><td></td><td>277</td><td>154</td><td>123</td></tr></table> Stronger Institutions for SDG achievement • 2018: Joined the UN Global Compact, implementing the ten principles of the UN Global Compact on human rights, labour, environment and fighting corruption • NCSA Lighthouse Project (KMP) • 2023: 2nd Best National Action SDG Award 2023 - Water, Energy and Sustainable Agriculture (award by National SDG focal point, National Planning Agency) • 2024: Avirama Nawasena - Innovation in ESG Awards, category Societal Change Innovation, School of Business Management ITB.	Year	Participants	M	F	2022	107	70	37	2023	170	84	86		277	154	123
Year	Participants	M	F																	
2022	107	70	37																	
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