

PAHANG PEATLAND RESTORATION PROJECT (PPRP)



PROJECT DESCRIPTION DOCUMENT (PDD) SUMMARY



Project title	Pahang Peatland Restoration Project
Project ID	5474
Project lifetime	1 February 2024 – 14 May 2083; 59-year lifetime
Project location	Malaysia, Pahang State, Pekan and Rompin districts
Project proponent(s)	Enggang (Pekan) Sdn Bhd
Validation/verification body	Earthood Services Ltd
Public comment period (1 month period)	8 August 2025 – 7 September 2025
Audit Date	Start 8 September 2025

1 SUMMARY DESCRIPTION OF THE PROJECT (SECTION 2.1.1)

The Pahang Peatland Restoration Project (PPRP, or “the Project”) is a grouped project that will protect and restore 96,569 ha of tropical peat swamp in Pahang State, Malaysia, 77,499 ha of which make up the Initial Project Area. The area represents the largest remaining contiguous peat and wetland forest area in Peninsular Malaysia and is a high conservation value ecosystem due to its high levels of endemic and threatened biodiversity, locally important ecosystem services (e.g., water regulation) and cultural significance for local communities. Consequently, beyond the reduction of GHG emissions, the Project will preserve and enhance the livelihoods and wellbeing of nearby communities as well as globally significant biodiversity. The Project is not within a jurisdiction covered by a jurisdictional REDD+ program.

The area under management for the Project—the Use Permit Area (UPA)—comprises 11 Permanent Reserved Forests (PRFs) legally designated under national forestry legislation. Six were officially gazetted in 1987–88, with the remaining five designated in 2006–07. Under Section 10(1)(a) of the National Forestry Act 1984, these PRFs are classified as ‘production forests’, intended for sustainable “timber production .” Since their gazettelement , timber production has been the primary management focus. Legally authorized logging has occurred within the concession area since 1999, with over 32,000 ha logged before the Project commenced.

The area has been designated by the Pahang State Government for timber production, to be managed under a Selective Management System (SMS) in accordance with Reduced Impact Logging (RIL) guidelines. However, in practice, timber harvesting often deviates from these standards. Unsustainable logging methods—including widespread clear-felling have caused significant ecological damage. This degradation has contributed to the proposed excision of several forested areas from the PRF system for conversion to agriculture, as well as unregulated clearance due to smallholder encroachment. Beyond unsustainable logging, the construction of canals, drainage channels, and roads has further disrupted the forest ecosystem, particularly affecting the peatland regions. These developments have altered natural hydrology, leading to the drying and oxidation of peat soils. As a result, the peatlands are

undergoing progressive degradation, which not only releases large quantities of greenhouse gases (GHGs) into the atmosphere but also heightens the risk of severe, uncontrollable fires. The Pahang Forest Management Plan (Jabatan Perhutanan Negeri Pahang, 2016) and the Mid-Term Review of the Southeast Pahang Peat Swamp Forest Management Plan (Jabatan Perhutanan Negeri Pahang, 2012) identified that logging activities were ongoing and planned to continue within the PRFs covered by the Project. The Forest Management Plan and the 10-year plans that follow would be developed focused on the same primary objective of timber harvesting.

In addition to the threat of legally sanctioned commercial logging, ongoing pressures for land and agricultural development have led to areas within the PRFs being allocated for agricultural development. For example, five parcels of land totaling 4,564 ha along the Bebar River were allocated to three companies between 2015-2017 for the purpose of oil palm plantation development. Further applications have also been made, including for an ~8,300 ha dairy farm, the application for which was cancelled as a result of rights being transferred to the PPRP for conservation. In addition, information from the Department of Survey and Mapping Malaysia (JUPEM) indicates that two land lots (covering over 3,000 ha in total) were identified for surveying as part of a process towards sub-division and alienation for agriculture.

The Project will avoid the release of ~174 million tCO₂e over 59 years by halting wetland degradation from logging and conversion to agriculture. Reforestation of degraded areas will remove ~11.8 million tCO₂e from the atmosphere, while fire prevention and peat rewetting will further reduce emissions from peat oxidation and fires. In total, the Project is expected to avoid and reduce ~186 million tons of CO₂e over 59 years, averaging ~3.1 million tons annually.

The Project Area is surrounded by indigenous communities belonging to the *Jakun* ethnicity. There are approximately 6,600 Indigenous People located in the Project Zone where the Project will deliver positive impact in terms of social, cultural and livelihood outcomes. Specifically, the Project will target health, education, traditional knowledge preservation, employment and ecosystem services as thematic areas for community development.

The Project will also contribute to reducing the vulnerability of the surrounding landscape and communities to the impacts of climate change by lowering the risks of fire and flooding, while enhancing the resilience of local livelihoods. This will be accomplished by reinvesting carbon finance generated through the Project back into the landscape. These funds will support targeted interventions focused on:

- **Fire monitoring and prevention:** Satellite imagery, drones and ground sensors will be used to remotely detect and monitor fire risks, while a dedicated Project fire team will be trained and equipped to respond to fire incidents, install preventative infrastructure such as fire breaks, monitor water table levels, and deliver fire response training to communities.
- **Community development and livelihood enhancement:** The Project will improve local community livelihoods and wellbeing by designing and deploying sustainable economic activities which will reduce reliance on practices that degrade peatlands, while fostering local stewardship. By stabilizing the ecosystem and providing alternative income sources, along with appropriate

training and support to access markets, the Project will create long-term resilience for both communities and the environment. The Project will support marginalized factions of communities by enhancing educational support for youth and enhancing access to healthcare for elderly and disabled people.

- **Forest monitoring and law enforcement:** A custom-built near real-time monitoring system and collaboration with authorities will enhance oversight and enforcement to prevent illegal logging, land conversion, and peat drainage.
- **Land and hydrology rehabilitation:** Peat rewetting, hydrological management (e.g., damming drainage canals), and forest restoration will reverse ecosystem degradation, improve biodiversity, and enhance carbon storage.

2 PROJECT OWNERSHIP (SECTION 2.1.9)

Enggang (Pekan) Sdn. Bhd. (“Enggang”) is the Project Proponent and holds a legal use right to the entire Use Permit Area (96,569 ha) that includes the Initial Project Area (77,499 ha) and parts of the Project Zone that overlap with the PRF where future project instances will be implemented. Legal rights to the UPA have been secured by Enggang through a Carbon Project Agreement (CPA) with the Pahang State Government effective 15 May 2023. A copy of this agreement can be made available to auditors on request. This agreement, together with prevailing legislation, grants Enggang the right to generate and sell carbon credits and to implement all planned project activities. To this end, Enggang has already paid for the Carbon Activity Use Permit to operate a carbon project and generate emission reductions. Evidence of the payment for and transfer of use rights to Enggang can be provided upon request.

3 PROJECT ZONE MAP AND PROJECT LOCATION (SECTION 2.1.16)

The Project Proponent holds management rights to the PRF within the UPA. Areas inside the UPA that are not part of the Initial Project Area are designated as the Protection Zone. This zone will continue to be managed to achieve improved conservation outcomes, without initially claiming any emissions reductions. Covering 19,095 ha, the Protection Zone represents potential areas for future expansion of project activities under the grouped project design. It forms part of the broader Project Zone, where the Project intends to generate positive impacts.

Including all villages where the Project aims to deliver net positive benefits through community development initiatives (see Sections 2.3.1 and 2.3.2), the total Project Zone extends over approximately 48,000 ha (Figure 11). Combined, the Project Area and Project Zone encompass about 125,000 ha where the Project expects to deliver positive outcomes for climate, communities, and biodiversity.

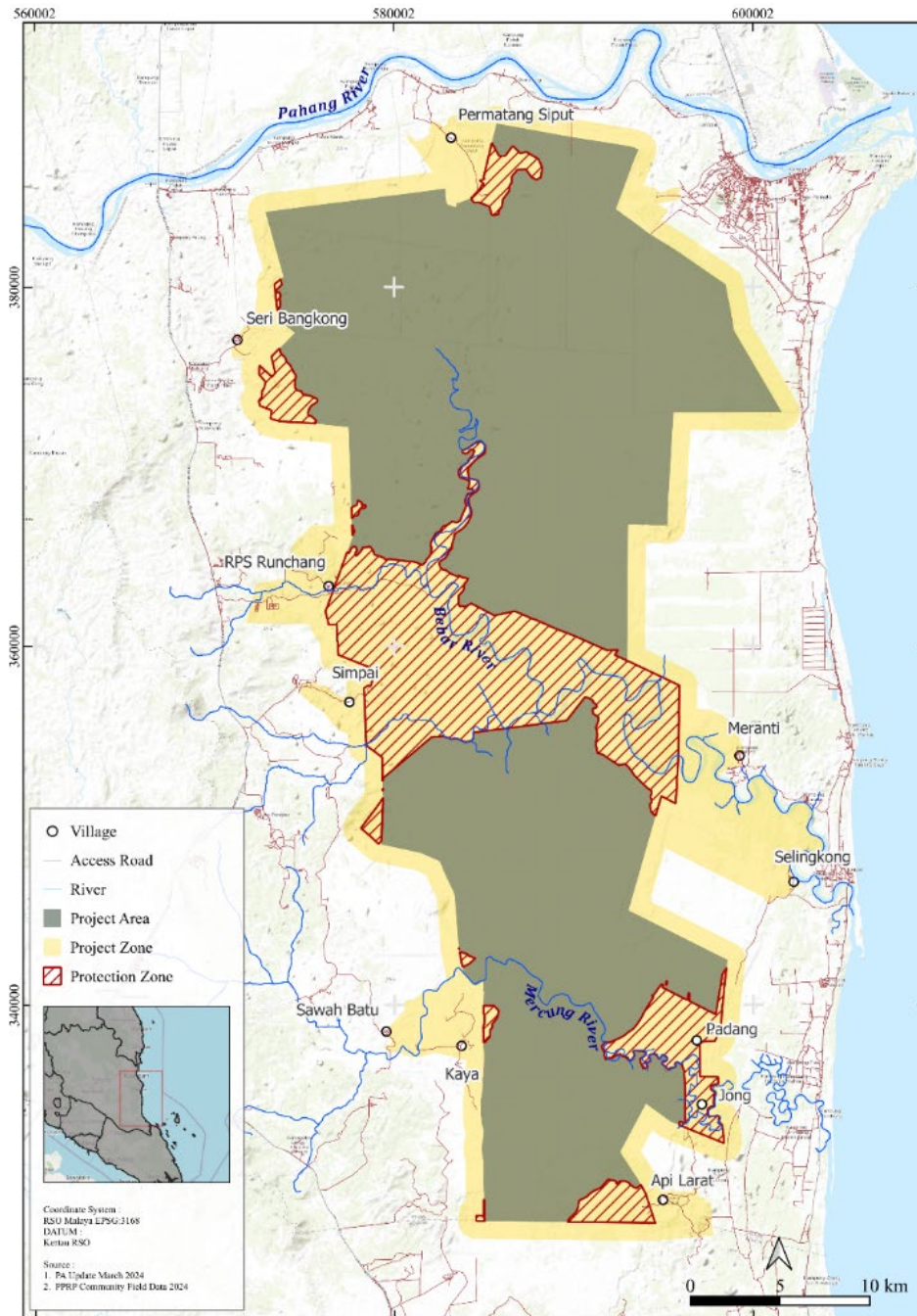


Figure 1: Map of Project Area and Project Zone

4 PROJECT ACTIVITY (SECTION 2.1.17)

PPRP identifying five key activities to achieve its objectives:

4.1 Preventing Commercial Logging and Agricultural Conversion

The project secures long-term land use and management rights through an agreement with the Pahang State Government, and establishes institutional frameworks for sustainable land stewardship. These efforts directly address threats such as commercial logging, agricultural conversion, and peatland drainage, thereby preventing the degradation of forest and peatland ecosystems.

4.2 Fire Risk Reduction and Peatland Restoration

The project implements the installation of canal blocks to restore water tables and re-wet peat, alongside fire prevention patrols and the establishment of early warning and rapid response teams. Community awareness campaigns promote understanding of fire risks and responsible land practices, while alternative livelihood support reduces dependence on fire-based land clearing. These activities address the threats of fire and peat drying caused by the existing drainage network, helping to restore the ecosystem services of peatlands, reduce greenhouse gas emissions, and deliver positive outcomes for the planet.

4.3 Managing Smallholder Overlapping Land Use

The project carries out participatory land use mapping and conflict resolution processes, alongside the implementation of livelihood diversification programs (e.g., eco-tourism, agroforestry, and employment in restoration and monitoring work). It also provides community development support, for example through school infrastructure, health programs, and access to clean water. These activities address the threat of smallholder encroachment and ensure effective engagement with local communities, contributing to positive social outcomes.

4.4 Biodiversity Conservation and Habitat Restoration

The project undertakes ecosystem restoration for example, through the replanting of native peat swamp species along with biodiversity monitoring and the protection of critical habitats for endangered species. Anti-poaching patrols and forest integrity surveillance are also conducted. These activities address the threats of biodiversity loss and habitat destruction, contributing to the conservation and restoration of the health and biodiversity of the peat swamp forest.

4.5 Integrated Governance and Cross-Cutting Support

The project engages multiple stakeholders and establishes multi-stakeholder platforms that include local communities, NGOs, and government agencies. It also develops monitoring, reporting, and verification (MRV) systems aligned with VCS and CCB standards, while fostering capacity building and knowledge transfer to support community-driven environmental management. These efforts contribute to national climate targets, biodiversity conservation commitments, and multiple Sustainable Development Goals (SDGs), particularly climate action (SDG 13), life on land (SDG 15), and poverty reduction (SDG 1).

5 SAFEGUARDS AND LEGAL COMPLIANCE (SECTION 2.5)

- This project complies with Malaysian laws.
- Occupational safety and anti-discrimination policies will be implemented.
- Priority is given to the employment of local workers, in accordance with labor laws and fair employment standards.
- The project does not prohibit Indigenous Orang Asli communities from entering the forest within the Project Area to carry out traditional activities such as fishing, hunting, and collecting forest products for their daily livelihood.
- Customary land is respected and excluded from the Project Area.

6 CLIMATE BENEFIT (SECTION 3)

6.1 Project Scope & Type

The PPRP is a long-term initiative that aims to restore degraded peatlands, protect forests, and support local communities. It is expected to reduce greenhouse gas emissions, prevent fires and floods, and conserve biodiversity. This project will run for 59 years (2024–2083) and is being developed under the Verified Carbon Standard (VCS) and Climate, Community & Biodiversity (CCB) standards, using methodologies VM0007 and VM0047, along with 11 Verra Modules and 4 Tools.

7 COMMUNITY ENGAGEMENT (SECTION 2.3)

This project is being developed in accordance with the principles of Free, Prior, and Informed Consent (FPIC) and has engaged 16 Jakun Orang Asli villages through the following efforts:

- Household surveys, consultation programs, and village meetings.
- Customary land mapping with active participation from the community.
- Boundary agreements signed with 8 villages as a guarantee of customary land rights.
- Establishment of Community Development Associations (CDAs) with inclusive representation.
- A Grievance Redress Mechanism (GRM) has been developed to ensure that any complaints or concerns are heard and addressed.
- Traditional practices such as fishing, hunting, and gathering forest products have been acknowledged as permitted activities, as long as they comply with the law.

7.1 Grievance Redress Mechanism (GRM) (SECTION 2.3.15)

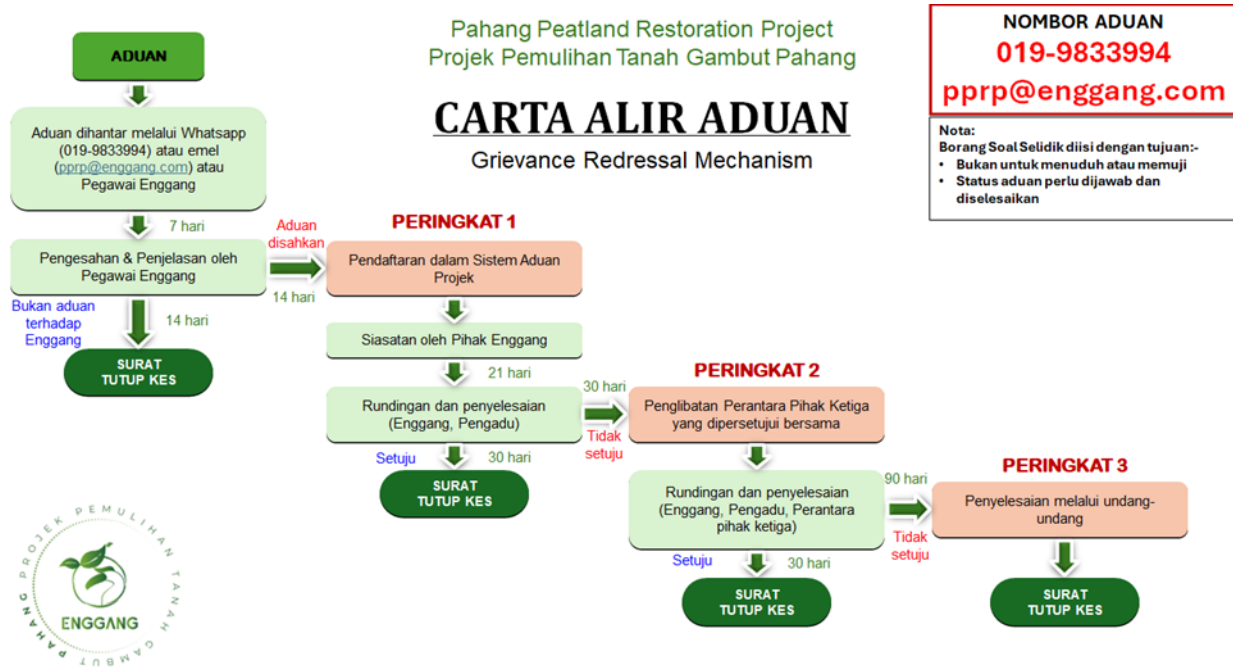
The GRM ensures that all community members especially Indigenous Peoples, women, youth, and vulnerable groups can safely and easily raise concerns or provide feedback.

How It Works:

Grievances can be submitted anonymously or with your name. All submissions will be acknowledged within 7 days. The process is free, confidential, and inclusive.

How It Submit:

Method	Details
WhatsApp or Phone	+60 199833994
Email	pprp@enggang.com
Village Mailbox	Located in each participating village
CDA Representative	Speak to your village representative
In Person	Talk to any project staff or Community Development Unit staff



7.2 Free, Prior, and Informed Consent (FPIC) (SECTION 2.5.7)

The Project adopts a phased FPIC process consisting of three stages for the implementation of project activities that may affect the rights of local communities, community groups, or other stakeholders. This process is carried out prior to the commencement of any project activity that could potentially impact local communities and Indigenous Peoples during the monitoring period.

Affected stakeholders have the right to refuse participation and/or withdraw their involvement at any time. Regardless of the outcome of the process, the Project team will maintain communication with relevant stakeholders to ensure they remain informed about project activities occurring near their areas.

Phase 1: Stakeholder Identification

The process begins with the collection of baseline community data through surveys, consultations, and mapping. Permission and consent are always sought before any engagement activities with the community. Subsequently, potentially affected stakeholders are identified. Clear communication is maintained, and stakeholders are informed of their right to decline or withdraw from participating in the Project at any stage.

Phase 2: Impact Assessment

Before any project activities commence, stakeholders are consulted to ensure that all potential risks, costs, and benefits are mutually understood and assessed in collaboration with the Project team. Details such as timing, location, and reversibility of activities are clearly communicated to stakeholders. Stakeholders may also use the Grievance Redress Mechanism (GRM) at any time to express concerns. All consultations are documented, and it is encouraged—though not mandatory—for the consultation outcomes to be jointly signed.

Phase 3: Consent and Benefit Sharing

Consent will not be sought from affected stakeholders without an agreed-upon benefit-sharing mechanism in place. Where negative impacts are identified, a fair and transparent benefit-sharing mechanism will be collaboratively developed. Consent will be documented through a jointly signed agreement, and a copy must be provided to the relevant stakeholders for their records. If consent is not obtained, project activities will be redesigned or cancelled in the affected area.

Respecting the rights and autonomy of Indigenous and local communities is a core principle upheld by the Project. FPIC is not merely a procedural requirement—it is a safeguard to ensure that no activity affecting communities is undertaken without their meaningful engagement and voluntary consent.

8 EXPECTED COMMUNITY BENEFITS (SECTION 1.2, 4.2.4, 4.4.1)

The project is designed to deliver CCB Gold Level community benefits over its lifetime:

- **Jobs:** Up to 80 full-time roles are expected to be created, with at least 25% for women.
- **Training:** Around 18,900 people including 9,450 women are expected to receive training.
- **Livelihoods:** Approximately 5,700 people are expected to benefit from improved livelihoods through agroforestry, eco-tourism, and non-timber forest products.
- **Health:** Improved water access and reduced haze-related illnesses are expected to benefit 7,100 people.
- **Education:** At least 12,300 youths are expected to complete secondary school with project support.
- **Culture:** The project will support the preservation of sacred sites and traditional practices through festivals and documentation.

9 BIODIVERSITY BENEFITS (SECTION 5.2)

The project area is home to at least 29 threatened species, and the project is expected to:

- Protect habitat for Critically Endangered species like the Raffles' Banded Langur, and Ramin Melawis.
- Support Endangered species such as the Hairy-nosed Otter, Wrinkled Hornbill, Malayan tapir, and White-handed Gibbon.
- Restore degraded areas with native plant species.
- Avoid the use of genetically modified organisms (GMOs) or invasive species.
- Monitor wildlife using camera traps, SMART patrols, bioacoustics and eDNA sampling.

10 MONITORING & TRANSPARENCY (SEKSYEN 3.3, 4.4, 5.4)

- Forest, water, and biodiversity will be monitored using drones, satellite imagery, and field surveys.
- Monitoring of community development activities will be carried out periodically, and reports will be produced on an annual basis.
- Results will be shared with communities in English and Malay via WhatsApp, printed materials, and public meetings.

10.1 CLIMATE MONITORING PLAN (SECTION 3.3.3)

Summary

The Pekan Peat Restoration Project (PPRP) will implement a structured and systematic monitoring framework to ensure transparent, accurate, and conservative accounting of GHG emissions, removals, and land-use changes. Monitoring activities will follow Verra VCS and CCB requirements, supported by standardized Standard Operating Procedures (SOPs) and an established Monitoring, Evaluation, and Learning (MEL) system.

Data Collection & Methods

Measurements will be collected using calibrated field instruments, automated data loggers, and remote sensing analysis. Data will be geo-referenced, stored in a centralized database, and verified through field surveys. QA/QC protocols will ensure accuracy through equipment calibration, cross-checking of remote sensing outputs with ground data, spot audits, and supervisory reviews.

Monitoring Components

- **Carbon Stock Enhancement:** Degraded/deforested areas will be assessed following VM0047, using stocking indices and performance benchmarks to detect carbon accumulation.
- **Forest Degradation:** Monitored via SMART patrols, biennial Participatory Rural Appraisals (PRA), and targeted transect surveys in access buffer zones. Evidence of tree harvesting will trigger fixed-area plot sampling and biomass estimation using allometric equations.
- **Deforestation:** Annual monitoring using ≤ 30 m resolution satellite imagery with $>90\%$ classification accuracy. Deforested area will be quantified per stratum and year; emissions will be calculated from pre- and post-deforestation carbon stocks following VMD0001/VMD0005.
- **Burnt Areas:** Remote sensing and ground verification to map fire scars and measure peat burn depth, applying IPCC 2006 emission factors for CO₂, CH₄, and N₂O. Burn scars will be stratified by peat type, vegetation, and pre-fire condition.
- **Hydrology:** Water table depth monitored at 291 piezometer points (including 93 automated loggers) across representative strata, with measurements every 1–2 months. Rainfall, temperature, and humidity will be continuously monitored via automated weather stations to support hydrological modelling.

Peat Dome / Forest Reserve	Drained				Undrained				Total
	GF	DF	SDF	NF	GF	DF	SDF	NF	
Pekan East	26	10	1	13	10	-	-	-	60
Pekan West	15	10	-	4	12	-	-	-	41
Nenasi	22	15	8	16	-	-	-	-	61
Resak	11	10	10	20	10	5	-	-	66
Resak Additional Set ^a					24				
Project Area					252				
Protection Zone (excluding Kedondong)					14				
Kedondong					25				
Grand Total					291				

*NF (Non-Forest), SDF (Severely Degraded Forest), DF (Degraded Forest), GF (Good Forest), ^a Resak Additional Set (installed by FRIM)

Hydrological Modelling: Models will integrate drainage network mapping, digital terrain models, groundwater flow data, rainfall records, and canal water levels to simulate spatial and temporal water table behaviour and improve GHG estimates.

Organizational Structure: The MEL framework defines roles from Project Lead to field technicians, with specific MRV responsibilities for data collection, analysis, and reporting. External evaluators and Verra-approved VVBs will validate annual monitoring reports.

QA/QC & Data Management: All data will be securely stored in SharePoint with metadata tagging, access control, and backup protocols. SOP-governed procedures ensure data integrity and traceability, with a full list of monitoring SOPs (EP-SOP series) covering forest protection, hydrology, biodiversity, community development, and MRV tasks.

10.2 COMMUNITY MONITORING PLAN (SECTION 4.4.1)

Outcome 1: Improved Livelihood and Economic Well-being							
Outcome 1.1: Enhanced livelihood							
Objectives and Gaps Addressed: Provide alternative, economically sustainable livelihood options rooted in ecosystem conservation, such as agroforestry and ecotourism							
Program	Targeted community group	Indicator / Variable	First year target	Five-year target	Ten-year target	Data collection method / Means of verification	Monitoring frequency
Capacity building training to enhance knowledge, skills and attitude on sustainable economic activities	Women	Number of participants at capacity building trainings	Identification of communities that have potential to be involved in the training	Minimum 50 participants (cumulative) attended the trainings, comprising of a minimum 50% youth and 30% women	Minimum 150 participants (cumulative) attended the trainings, comprising of minimum 50% youth and 30% are women	Impact Assessment Report / attendance record	Annually
	Youth (> 18 years of age)						
	NTFP Gatherers						
	Fishers	Number of capacity building trainings	Design suitable training curricular to improve incomes	Minimum 3 multi-module capacity building programs	Minimum 5 multi-module capacity building programs	Program documentation / survey / interview	Annually
	Smallholders						
	Traditional Hunters						
		Number of participants who have increased their income	Identify current income levels	15% of the participants (30% of them are women) have increased their income by 25%	30% of the participants (30% of them are women) have increased their income by 50%	Program documentation / survey / interview	Annually

Outcome 1.2: Increased employment opportunities

Objectives and Gaps Addressed: Create expanded employment opportunities through direct jobs, contractual services, and related economic activities

Program	Targeted community	Indicator / Variable	First year target	Five-year target	Ten-year target	Data collection method / Means of verification	Monitoring frequency
Job creation for local communities	Local communities	FTE of local communities for jobs created by Project	15 FTE (minimum 20% women)	25 FTE per year (minimum 25% women)	50 FTE per year (minimum 30% women)	Company record	Annually

Outcome 2: Improved Level of Education and Environmental Sustainability Awareness

Outcome 2.1: Increased awareness of biodiversity, ecosystems, climate change and sustainability

Objectives and Gaps Addressed: Foster a deeper understanding of environmental issues to support and enhance local communities' ongoing stewardship of the landscape

Program	Targeted community	Indicator / Variable	First year target	Five-year target	Ten-year target	Data collection method / Means of verification	Monitoring frequency
Awareness programs on biodiversity, ecosystems, climate change and sustainability	Local communities	Number of participants attending awareness programs	Engagement with local communities	Minimum 1,500 participants (cumulative) attended the programs, comprising of a minimum 50% youth and 30% women	Minimum 3,000 participants (cumulative) attended the programs, comprising of a minimum 50% youth and 30% women	Impact Assessment Report / attendance record	Annually
		Number of awareness	Engagement with local communities	At least 50 awareness programs	At least 100 awareness programs (cumulatively) with	Program documentation	Annually

		programs conducted		(cumulatively) with 30% participation by women	30% participation by women	/ survey / interview	
		Number of local community participants in replanting efforts	Engagement with local communities for participation in forest replanting efforts	100 local community (cumulatively) participate (30% of them are women) in forest replanting efforts	300 local community (cumulatively) participate (30% of them are women) in forest replanting efforts	Program report / attendance record	Annually

Outcome 2.2: Increased school attendance

Objectives and Gaps Addressed: School dropout is a key driver of social issues and a major contributor to intergenerational poverty within the Project Zone communities. While government provisions for education and incentives are in place, this program specifically targets the cultural and social barriers that lead to marginalization. It aims to reintegrate youth into the formal education system and equip them with both academic qualifications and essential soft skills to support their educational and career development

Program	Targeted community group	Indicator / Variable	First year target	Five-year target	Ten-year target	Data collection method / Means of verification	Monitoring frequency
Community Learning Hub to supplement mainstream schooling and to mentor children and youth individually to prevent school dropout	Children and Youth	Number of Community Learning Hub established	Engagement with local communities, NGOs, and schools	1 Community Learning Hub established	3 Community Learning Hubs established	Project documentation (which will include evaluations from both teachers and participants)	Annually
		Number of children and youth that attended the	Engagement with school and local communities	Minimum 75 children/youth (cumulative)	Minimum 150 children/youth (cumulative school year equivalent)	Attendance records	Annually

		Community Learning Hub		school year equivalent)			
		Number of children and youth that attended the Community Learning Hub who avoided dropout before finishing secondary school	Engagement with school and local communities	Minimum 15 children/youth (cumulatively)	Minimum 45 children/youth (cumulatively)	Attendance records, school certificates	Annually

Outcome 3: Improved Health and Well-being

Outcome 3.1: Accessibility to clean water

Objectives and Gaps Addressed: Improved health and well-being by supplementing government amenities and/or providing 'last mile' services

Program	Targeted community	Indicator / Variable	First year target	Five-year target	Ten-year target	Data collection method / Means of verification	Monitoring frequency
Clean water program	Local communities in need (households with insufficient clean water supply)	Number of households with improved access to clean water supply	Identify areas and villages with limited access to clean water supply and engagement with water supply agency	50 households with improved access to clean water supply	75 households with improved access to clean water supply	Community surveys	Annually

Outcome 3.2: Accessibility to healthcare services

Objectives and Gaps Addressed: Improved accessibility to healthcare services, such as facilitating health screening services and/or assisting registration with government provided services or programs

Program	Targeted community	Indicator / Variable	First year target	Five-year target	Ten-year target	Data collection method / Means of verification	Monitoring frequency
Improve accessibility to healthcare services	Vulnerable individuals and households in communities, e.g., people with disabilities and elderly people	Number of people participate in the health screening and consultation program	Engagement with health agencies and local communities	Minimum 100 cumulative participants (30% women) in health screening and consultation program	Minimum 200 cumulative participants (30% women) in health screening and consultation program	Project documentation	Annually

10.3 BIODIVERSITY MONITORING PLAN (SECTION 5.4.1)

Outcome 1: Monitoring of Endangered Species							
Outcome 1.1: Endangered species monitoring system							
Program	Indicator	First year target	Medium term target (5 years)	Long term target (≥10 years)	Data collection method	Means of verification	Monitoring frequency
Long-term monitoring of presence of endangered fauna RTE species e.g., Raffles' Banded Langur (RBL)	Number of locations with species encountered Number of species Abundance and occupancy	Baseline data collected on abundance and occupancy of endangered species	Existing abundance and occupancy monitored, and new numbers recorded (10 - 20% encounters) Existing distribution of Endangered species with 2-3% trend increased record	Achievement of minimum viable population of endangered species in the Project Area	Camera traps / field surveys / Visual Encounter Survey (VES) / bio-acoustic devices / eDNA approach / SMART Patrol	SMART Patrol report / biodiversity monitoring report (distribution maps, photos, species lists, SMART Patrol analysis)	Annually

<p>Long-term monitoring of presence of flora RTE species, e.g., <i>Gonystylus bancanus</i> (Ramin melawis) (CR)</p>	<p>Number of locations with species encountered</p> <p>Number of species</p> <p>Abundance and occupancy</p>	<p>Baseline data collected on abundance and occupancy of endangered flora species.</p>	<p>Existing abundance and occupancy monitored, and new numbers recorded (10 - 20%)</p> <p>Existing distribution of Endangered species with 2-3% trend increased record</p>	<p>Achievement of minimum viable population of endangered species in the Project Area</p>	<p>Field surveys / SMART Patrol/ permanent vegetation monitoring plots</p>	<p>Biodiversity monitoring report (distribution map, pictures, species list, SMART Patrol analysis)</p>	<p>Annually</p>
<p>Establish and strengthen stakeholder collaboration for the protection of endangered species (i.e., with government authorities/agencies, NGOs and plantation companies)</p>	<p>Number of stakeholders consulted</p> <p>Number of meetings / related activities held</p>	<p>Conduct annual awareness program / meeting</p> <p>Deliver stakeholder outreach event on biodiversity conservation</p>	<p>Enhance cooperation with relevant authorities and institutions for effective law enforcement</p> <p>Improve coordination between various related stakeholders to support conservation programs</p> <p>Enhance stakeholder knowledge through cooperation with relevant</p>	<p>Strong collaboration and coordination established with relevant stakeholders</p> <p>Maintain and train person in charge (PIC) related to conservation activities</p>	<p>Meetings and discussions, field surveys, socialization and training</p>	<p>Reports on activity and engagement / attendance records</p>	<p>Annually</p>

			authorities and institutions				
--	--	--	------------------------------	--	--	--	--

Outcome 2: Ensure Ecosystem and Habitat Integrity

Outcome 2.1: Protected forest area and habitats

Program	Indicator	First year target	Medium term target (5 years)	Long term target (≥10 years)	Data collection method	Means of verification	Monitoring frequency
Remote forest cover monitoring and detection of fire and deforestation	Net forest change (gain vs. loss) Land cover classification	Baseline record of forest cover and identify potential threats from any source	Potential threats and existing forest cover identified and monitored	All forest cover monitored with established monitoring system	Satellite monitoring, drone surveys, ground surveys	Report on number of hotspots and forest cover changes	Post-event and/or annually
		Land use changes in the Project Area assessed including agricultural activity	Conversion of land cover monitored over 5 years and a strategy developed to reduce potential future conversion	Conversion of land cover monitored over 10 years and a strategy developed to reduce potential future conversion		Fire and deforestation reports	
		Establish satellite-based fire hotspot and deforestation monitoring website	10% decrease in fire hotspots (occurrence, size of affected forest area)	30% decrease in fire hotspots (occurrence, size of affected forest area)		Loss event and reversal reports	

Monitoring of threats	Illegal activity such as poaching, collecting NTFP and logging reduction and elimination	Identify hotspots and frequency of illegal activity based on historical records and community inputs.	Illegal activities / illegal entry reduced by 50%	No incidences of illegal activities	Field survey / SMART Patrolling / number of poaching incidences / numbers of threat reports	SMART Patrol reports / survey reports	Monthly
	SMART Patrolling covering key protected area/habitat	Conduct preliminary survey on poaching, illegal NTFP collection, and illegal logging.					
		Implementing SMART patrols as an initial measure to combat detrimental poaching activities and strengthening monitoring, reporting to authorities as the means to protect wildlife populations	Poaching reduced by 50%	No poaching incidents			
			Expand and strengthen the network of anti-poaching patrols to cover larger areas of protected key habitats	Integrated and sustainable anti-poaching patrol system implemented in all areas vulnerable to poaching			

			Patrol teams established and trained in monitoring.	Patrol teams have the ability, capacity and independence to support protection in Project Area and habitat of endangered species	Number of training events held / staff attended	Training reports including training assessment	Annually
Outcome 2.2: Improvement of species diversity							
Habitat restoration and improvement of species diversity	Restoration of degraded areas to functional tropical peat swamp forest	Habitat restored over at least 5% of the degraded habitat within the Project Area	Habitat restored over at least 10% of the degraded habitat within the Project Area	Habitat restored over at least 30% of the degraded habitat within the Project Area	Field verification: 1. Vegetation cover 2. Survival rate 3. Number of restored areas	Field verification / biodiversity monitoring reports / reforestation report	Annually
		Rewetting activities (e.g., canal blocking) planned Install at least 44 canal blocks in priority sites	All targeted canal blocks installed in priority sites	Entire Project Area re-wet	Field verification: Number of canal blocks installed	Field verification report, biodiversity monitoring report	
	Species richness and diversity monitoring	Selected Biodiversity surveys completed	Systematic monitoring of species composition and abundance established	Management plan on targeted species established	Field surveys/ Flora and fauna surveys	Biodiversity check list and trends, Biodiversity Monitoring Report	

Monitoring of invasive species	Invasive species list and distribution are documented	Conduct regular monitoring and mapping of invasive species across the Project Area.	Research on invasive species control	Control management plan established and implemented	Field monitoring	Biodiversity monitoring report	Annually
--------------------------------	---	---	--------------------------------------	---	------------------	--------------------------------	----------

Outcome 3: Outreach and Awareness

Outcome 3.1: Improved level of knowledge and awareness among stakeholders

Program	Indicator	First year target	Medium term target (5 years)	Long term target (≥10 years)	Data collection method	Means of verification	Monitoring frequency
Develop environmental education module	Environmental education module developed and implemented Community trainers trained Facilitators/trainers in place Module reviewed and improved	Engage and initiate public awareness on wildlife and peatland conservation	Education delivered to 50% of communities in the Project Zone	Education delivered to 100% of communities in the Project Zone	Training / education activities Training session attendance data	Module booklet, attendance records, program report / training report	Annually
			Annual review and update	Review and improve environmental education module			
			Community members trained as facilitators	Community members trained as facilitators			
Produce publication materials	Conservation information conveyed to the public	Produce publications in multiple/local languages and formats (posters,	Produce two scientific papers	Produce five scientific papers	Research and collaboration with other institutions	Publications, posters, newspaper articles, leaflets	Annually

		newspaper articles, leaflets, etc.)			Number of publications		
Environmental education and collaboration with communities to protect species and their habitat	Level of community awareness and involvement in conservation activities and environmental education	Increase the number of participants or participants in environmental education and awareness programs by 10% annually	Increase the number of participants or participants in environmental education and awareness programs by 50%	Increase the number of participants or participants in environmental education and awareness programs by 80 - 100%	Training / awareness activities	Awareness and outreach reports	Annually
		Involve at least one local community group in conservation activities or environmental projects annually	Maintain active collaboration with at least three local community groups on conservation activities or environmental projects over five years	Maintain active involvement of most of the local community groups in conservation activities or environmental projects	Number of conservation activities or environmental projects, number of communities involved	Awareness and outreach reports	Annually
Awareness and outreach for youth	Number and level of beneficiary awareness Youth participation	Raise awareness among youth in local communities	Enhance cooperation with relevant authorities and institutions for effective conservation and education programs	Maintain and strengthen the awareness that has been cultivated over the past 10 years by continuing the implementation of environmental education programs in	Training and awareness activities	Awareness and outreach reports, record of attendance	Annually

				schools and villages			
Establish outreach and awareness program	Target audience aware of importance of the peat ecosystem and biodiversity	Conduct annual training and awareness activities	50% of communities in Project Zone reached with awareness program(s)	100% of communities in Project Zone reached with awareness program(s)	Training / activities	Number of communities approached	Annually