



Merang REDD Pilot Project (MRPP)

Rehabilitation, Conservation, and Protection of the Merang Peat Swamp Forest



Supported by :



Federal Ministry for the Environment, Nature Conservation and Nuclear Safety



In South Sumatra, the Merang peat swamp forest area is a promising location for a REDD pilot project due to the still relatively intact forest cover and the large below ground carbon storage in the peat soil. In close proximity to the protected areas of Sembilang National Park in South Sumatra province, and Berbak National Park in Jambi province, the Merang project area comprises of one of the last contiguous peat forest areas of Southern Sumatra. Yet it is jeopardized by illegal logging and expanding plantations and without conservation measures, this last peat land forest of Southern Sumatra could soon be lost.

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Rehabilitation, Conservation, and Protection of the Merang Peat
Swamp Forest

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MRPP is a grant technical cooperation project between the Government of Indonesia and the German Government. Implemented by GTZ (Deutsche Gesellschaft für Technische Zusammenarbeit) GmbH Indonesia, the project is funded by The German Federal Ministry of Environment, Nature Conservation and Nuclear Safety (BMU). MRPP is part of the German federal government's **Climate Initiative** and for the duration of the project (2008 - 2011) it is financed as a grant scheme for 1.445.250 Euro.



A carbon inventory is being developed using stratification and sampling plots, and techniques are being developed to increase the accuracy of tree-based carbon estimates.

Protecting the Last Remaining Peat Swamp Forest in South Sumatra

The Merang REDD Pilot Project (MRPP) was established to protect and restore the Merang Kepahyang peat swamp forest in South Sumatra. The project contributes to national biodiversity conservation targets and has a strong community development component. It is part of the REDD¹ readiness activities of the Indonesian government.

Overall Objective

Contribute to sustainable natural resource management, biodiversity protection and rehabilitation of degraded peat lands in South Sumatra.

Project Purpose

Protection and part rehabilitation of the last natural peat swamp forest in South Sumatra and its biodiversity through a system of Forest Management Units (FMUs) or *Kesatuan Pengelolaan Hutan Produksi* (KPHP), and preparation for REDD implementation.

Project Activities

1. Identify measure and monitor peat lands, forest carbon, biodiversity, and areas for rehabilitation.
2. Develop a management structure for the Merang peat lands area and prepare rehabilitation implementation.
3. Integrate fire management with measures to reduce illegal activities through community participation and sustainable natural resource management.
4. Develop and promote carbon trading and management concepts as part of REDD preparation.



In 1979 a timber plantation started to operate in the Merang Kepahyang peat swamp for selective logging. Soil compaction and peat drainage was low as only logging trails operated by small locomotives were built for timber extraction. In 1999 the company stopped operations and with no management or protection of the forest, illegal logging became rampant. Both locals and immigrants were attracted to cut timber. Local forestry authorities did not have the capacity to combat illegal logging and wild fires, and by 2007 about 40% of the forest had been destroyed.

¹Reduction of Emissions from Deforestation and Forest Degradation (REDD) is a broad set of actions designed to use market/financial incentives in order to reduce the emissions of greenhouse gases, and that may provide other benefits such as biodiversity conservation and poverty alleviation. REDD credits offer the opportunity to utilize funding from developed countries to reduce deforestation in developing countries.

MAP

Project Location

The Merang peat dome forest in the Bayung Lencir sub district of Musi Banyuasin District (MUBA), South Sumatra Province, is located between the Medak and Kepayang rivers. The Merang peat dome forest covers approximately 150,000 hectares and is part of a larger peat swamp area that is linked to Sembilang National Park in the east, Muaro Jambi peat swamp forest in the north (adjacent to Jambi Province) and Berbak National Park in the northwest.

The project site covers approximately 24,000 ha within the Merang peat swamp forest area. The area selected for the project was recommended by the Regent of Musi Banyuasin District and is a former production forest. On the 10 September 2009, the Regent issued two decrees (No. 23 and 24) approving the Merang REDD Pilot Project (MRPP) and establishing a Forest Management Unit (FMU) that includes the project area. On the 7 December 2009, the Minister of Forestry approved the Lalan FMU as a model FMU for managing 265,953 ha of various forest concessions and conservation areas with decree Sk.789/Menhut-II/2009. The MRPP was allocated a 24,000 ha plot within the area of the Lalan FMU.

There are no villages or communities inside the project area; however outside villages exist along the major rivers surrounding the area. Camps inside the area are usually built up by illegal loggers and trespassers. The villages of Muara Merang and Kepayang are the most adjacent to the Merang Kepayang peat swamp forest (Muara Merang is approximately 225 km from the provincial capital of Palembang). Rivers provide the main access to villages although some private companies (oil and oil palm plantations) have built a few small road networks.

Forest and land cover

Table of land classification.

Land Cover	Size (ha)	Percentage (%)
Dense Secondary Forest	3216.65	13.3
Medium Secondary Forest	5195.29	21.5
Forest Regrowth	2761.16	11.4
Open Secondary forest	2292.96	9.5
Regrowth-Macaranga	138.94	0.6
Regrowth-Gelam	1188.65	4.9
Shrubs	1240.58	5.1
Grassland	1304.76	5.4
Open / Burnt land	3497.88	14.4
Water	50.14	0.2
Clouds	586.53	2.4
Shadow	118.55	0.5
Recently logged	2618.87	10.8

Biodiversity in the peat swamp forest includes 170 tree species, 50 mammalian species, 150 bird species and 80 types of fish.





Causes of deforestation

Illegal logging

Illegal loggers make use of rivers and tributaries to get access for timber extraction. Where no accessibility exists they dig and build canals in the peat soil. These canals increase the peat drainage and cause carbon emissions from peat decomposition. There are more than 100 ditches or small canals in the Merang peat dome forest built by illegal loggers for extracting timber to the main rivers.

Illegal logging is also closely related to the “*lebak lebung*” system, the fishing rights in a part of the river area. Fishing rights are granted by auctions in the district capital. However, the main source of revenue from the *lebak lebung* license holder is said not to come from fishing, but from a fee for illegal logs (per cubic metre) to pass along the waterway.

Illegal logging is well organized by “*Tauke*” (patrons) who give small loans to loggers (around 1 million rupiah) to begin work and require the loggers to sell the wood exclusively to them. If no wood is harvested the loggers cannot pay back their debts and have to cover high interest rates. The *tauques* are generally well connected so that they are relatively immune against criminal sanctions (experience in the field shows that loggers feel secure and are not irritated by being photographed or filmed when carrying out their activities). Estimates reported in the draft spatial management plan for Musi Banyuasin (Government of Musi Banyuasin, 2006), are of up to 200 rafts, each with three or four logs of four-meter length, leaving the area each day in 2002 and 2003.

An illegal logging survey that was conducted in collaboration with the Muhammadiyah University Palembang (February 2009), confirmed the persistence and magnitude of the illegal logging activities in the area. Wood extracted from the MRPP area during one felling period was estimated to be 94,500 to 135,000 m³ logs and 54,000 to 72,000 m³ of timber. From five days observation in the river, the survey team found that the illegal rafted wood towed downstream to sawmills was 4,674.5 m³.

Illegal loggers cut only commercial logs (predominantly dipterocarps) and both sinkers and floaters. Commercial logs commonly extracted include Meranti² (*Shorea* sp), Ramin (*Gonystylus bancanus*), Punak (*Tetrameristra glabra*), Manggris (*Kompassia malaccensis*), Mahang (*Macaranga pruinosa*), Medang pelem (*Litsea* spp), Tenam/Mersawa (*Anisopthera marginata*), and Resak (*Vatica rassak*).



Fire

Fires in 1982, 1987, and 1997 were particularly severe because logging changed the ecological conditions of the wet peat dome ecosystem into a drier one. Illegal loggers worsened the situation by digging small canals through the forest, which drained out the dome during the dry season. Carelessness associated with discarding cigarette butts or loggers' cooking fires were believed to be the sources of ignition.

Illegal logging and forest fires constitute a major threat to the success of a REDD project. If it cannot be significantly curbed, then a certificate for trading within the global REDD mechanism may not issued.

Conversion

In 2007, the Ministry of Forestry issued a decree for PT Rimba Hutan Mas (Sinar Mas Group) to convert 67,000 ha of peat swamp forest in the Merang peat dome forest for timber plantations. Other companies, PT Pakerin and Bumi Persada Permai (Sinar Mas Group), have already begun to convert the peat forest, though neither are operating inside the Merang peat dome forest. PT Sumber Hijau Permai (Sinar Mas Group) started its operation in 2004 adjacent to Sembilang National Park, which is partly inside the peat lands, and PT Tiesco is in negotiations with the Ministry of Forestry for the area north of PT Rimba Hutan Mas.

² Frequently called Philippine Mahogany, this is not mahogany but *Shorea* species from the Dipterocarpaceae family that contains five distinct, commercially important trees named Meranti.



Emissions and carbon stock

In 1989, 95% of the project area was covered by natural peat swamp forest and it is estimated that the project area stored about 6.5 million tons of carbon. In 2007, 9,000 ha had been degraded and deforested due to logging and fires. The deforestation and degradation decreased the carbon stock to about 3.8 million tons.

The project area is located in the center of the peat dome with around 1-6 meters peat depth. If it is assumed that the average peat depth is 3 meters; the total amount of carbon stored in peat soil is estimated to be about 4 million tons.

Ongoing illegal logging activities leading to deforestation, peat land degradation, and peat oxidation - as well as forest fires - cause huge emissions of greenhouse gases. Without the project the Merang peat forest will degrade further or be lost completely, in the worst-case scenario within 2-5 years.



MRPP objectives

The stated objective for MRPP is that “a forest management unit system for the protection and rehabilitation of the natural peat swamp forest areas in South Sumatra is operational and the knowledge and expertise for the implementation of the relevant REDD-mechanism is available.” There are two components to achieve this:

Component 1: FMU establishment, rehabilitation, biodiversity and REDD in Merang Peat Dome Forest.

Support the protection and rehabilitation of the natural peat swamp forest in South Sumatera and its biodiversity through a FMU management system and preparation for REDD mechanism.

Component 2: Information, communication, visibility and knowledge management for MRPP and stakeholders.

Lessons learnt and experiences of the MRPP area are available to relevant national and international stakeholders. Networking between other donor initiatives to reduce deforestation and degradation of peat forests is enhanced.

Major Indicators (until December 2011):

- A management structure (FMU) for the Merang peat lands area is established.
- All relevant FMU stakeholders participate in capacity development.
- Collaborative management plans between local people with relevant stakeholders.
- Peat swamp forest biodiversity is analyzed, monitored and protected.
- At least one appropriate, innovative and sustainable approach for rehabilitation is developed and implemented.
- REDD preparation steps and documents according to international and national requirements are ready until the middle of 2011.
- Estimates on merchantable carbon for trading are available according to national and international requirements and best practices.
- Potential investors identified, either non market based (in early process) or market based (in advanced process) determined and offered.
- Alternative income generating activities for community (gender sensitive) are promoted instead of illegal logging/illegal practices.
- Knowledge management is applied within MRPP and in disseminating important products and messages.
- Capacities strengthened.



Institutional framework

Stakeholder participation at all levels was arranged from the start of MRPP. At **national level**, MRPP has an implementing protocol with BPK (Directorate General for Forest Production Management / *Bina Produksi Kehutanan*) and the Directorate General of Forest Planning / *Planologi Kehutanan* in the Ministry of Forestry.

At **provincial level**, MRPP has an implementing protocol with the Provincial Forestry Services as an executing agency, as well as with the Provincial Climate Change Taskforce.

At **district level**, MRPP has a strong partnership with the District Forestry Services as the executing agency, with the District Planning and Investment Agency functioning as the coordination forum, and the FMU Lalan as the legal entity for management and future carbon markets.

The roles and relationship of the Central Government policies on deforestation reduction and National Carbon Accounting System consist of:

1. Central Government:

- a. Policy interventions to tackle drivers of deforestation and forest degradation
- b. REDD regulations (REDD Guidelines and REDD Commission)
- c. Methodology (establishment of National REL and MRV system³)
- d. Institutional (National Registry, distribution of incentives/ responsibilities, capacity building, stakeholder communication, coordination among REDD institutions)
- e. Analytical tasks (REL, MRV, Co-benefits, risks, etc.)

2. Provincial level stakeholders

- a. Methodology (establishment of Provincial REL and MRV systems)
- b. Institutional (capacity development, stakeholder communication, and coordination among REDD institutions)
- c. Demonstration activities, voluntary carbon projects.

3. District level stakeholders

- a. Methodology (establishment of District REL and MRV system)
- b. Institutional (capacity development, stakeholder communication, coordination among REDD institutions)
- c. Demonstration activities, voluntary carbon projects.

4. Project level stakeholders

- a. Methodology (establishment of Project REL and MRV systems)
- b. Institutional (capacity development, stakeholder communication, and coordination among REDD institutions)
- c. Demonstration activities, voluntary carbon projects

³ National REL and MRV system - what's this?

Implementation Activities

The major project components are biodiversity protection, community development, rehabilitation and preparation for REDD. The project aims to achieve 4 results and various activities are planned for each of these.

1. Identify, measure and monitor peat lands, forest carbon, biodiversity and areas for rehabilitation.

Benefiting from various studies and other work carried out under the EU-funded South Sumatra Forest Fire Management Project (SSFFMP) in the same area between 2003 and 2007, geo-monitoring systems have already been set up. To date the carbon stored in the forests (above and below ground) has been inventoried and the methodologies developed by the project are the basis of the national regulation for carbon inventories in production forests.

- a. **Baseline Monitoring for Carbon Stock Change in Merang Peat Swamp Forest.** Improvement of the methodology for carbon stock estimation is being conducted. The development of a local allometric⁴ relationship that will increase the accuracy of tree-based carbon estimation is underway and a carbon inventory is being developed using stratification and sampling plots. This should comply with Tier 3 methodology.
- b. **Landscape assessment.** Due to variation in forest use and threats, different carbon stock will occur at different vegetation types across the landscape. Using remote sensing techniques, land cover change assessment can be monitored where it is possible to calculate the merchantable volume of carbon using Tier 1 or Tier 2 methodologies. Landsat images are available from 1989 – 2008, SPOT 4 and SPOT 5 images with 10-meter resolution are also available for some parts of the area, and high resolution Quickbird images from the year 2007 with 0.6 m resolution were purchased to identify tree coverage, logging damage and canal distribution.
- c. **Plot measurement.** A land cover map derived from satellite imageries will be used for area stratification. Additionally, peat depth information should give more information on stratification for carbon stock.
- d. **Tree-based biomass quantification.** To estimate tree biomass, local allometric equations developed from similar forest types can be used. MRPP is conducting a study on allometric equations in peat swamp forests to get a higher level of precision in carbon calculations. The nearest forest type that has been studied for allometric equation is Jambi lowland secondary forest, and local allometric equations based on harvesting methods are being developed.



⁴ The change in proportion between size and shape as a consequence of growth.



2. Develop a management structure for the Merang peat lands area and prepare rehabilitation implementation.

- Establishment of a management structure for the FMU for the Merang peat lands area.
- Participation of all relevant stakeholders.
- Development and implementation of at least one appropriate, innovative and sustainable approach for rehabilitation. The project has been implementing community-based, peat swamp forest rehabilitation activities that include seedling production, village nursery development, reforestation by local communities and hydrological restoration through canal blocking. Village nurseries in Muara Merang and Kepayang are being developed with both providing 100,000 seedlings for swamp forest rehabilitation. Training and technical assistance has already been offered to these villages and the seedlings will be bought by MRPP for Rp. 1,000 per seedling. The objectives of canal blocking are to restore the hydrology in the area in order to support the rehabilitation program, to prevent fires and to give direct benefit to local communities through income generating activities such as fish farming.



3. Integrate fire management with measures to reduce illegal activities through community participation and sustainable natural resource management.

The objective of the fire management plan is to ensure that stakeholders in the area, including the FMU and the community forest rangers, are adequately trained and equipped to reduce the impact of fires in the project area and surrounding forests. The area is divided into 3 zones.

- **Buring zone:** At present there is significant illegal logging activity in this zone, but it has a relatively low risk of fire occurrence.
- **Tembesu zone:** Located in the center of the project area it is the most fire prone due to previous and current extensive illegal logging. The primary channel is a man made extension of the Tembesu River. Originally only about 1 km in length it is now more than 20 km long. This channel has led to a gradual reduction in the water table of the adjacent dome area resulting in a drier, fire-prone ecosystem.
- **Kepayang zone:** Located in the eastern side of the project area it has a moderate risk of fire occurrence. Illegal logging continues here and in the surrounding area.

The project is implementing a community-based fire management approach to fire management in which local communities are actively engaged in the development and in some instances implementation of fire management strategies designed to prevent, control or utilize fires in ways that will improve their livelihood, health and security. Fire patrols are conducted within the project area. A typical fire patrol is conducted by a community forest ranger with instruction from the forest manager or MRPP technical advisor.



Community forest rangers are trained to take part in fire patrols and for the initial response to fire incidents that occur during the dry season.

4. Develop and promote carbon trading and management concepts as part of REDD preparation

While the MRPP's purpose is to support the protection and rehabilitation of the last natural peat swamp forest in South Sumatra, it is planned that the FMU would receive payments for environmental services such as providing carbon peat sequestration, biodiversity protection and for emission reductions. Under the national mechanism or the voluntary markets, the Payment for Environmental Services (PES) mechanism will be developed to prepare a charging system for users and paying service for providers. Hence, the establishment of an institutional framework is required, in this case the FMU.

In line with the national regulations, the MRPP will develop a design for a sustainable flow of financing requirements and develop a basis and framework to allow legal transactions between buyers and sellers. The design will include the opportunity for continuous and open-ended payments and to avoid any negative incentives.

The targeted users of the environmental services who would provide the payments are most likely to be carbon buyers from voluntary and/or compliance markets, and other investors with corporate social responsibility policies. There is no precise information on benefit sharing due to the Indonesian regulations that are currently being developed.



Possible illegal logging reduction operation strategies were developed in collaboration with the Head of the Lalan FMU, PT Rimba Hutan Mas and MRPP. As a result, the Lalan Sub-district Head issued a decree No. 14, dated 4 June 2010, on the establishment of an integrated team to mitigate illegal logging in the sub-district jurisdiction. Team members consist of representatives from institutions / agencies at sub-district level including forestry, police, military, sub-district office, related village heads, community forest rangers, NGOs, MRPP, and PT Rimba Hutan Mas. The team's first operations were conducted during June and July 2010 and resulted in the confiscation of hundreds of illegal logs and sawn timber. After socialization, negotiation, and gaining consent from the local community, the team also succeeded in blocking the upper Merang River and the mouth of Buring River with log barricades. The activity was supported by a barge and heavy equipment from PT Rimba Hutan Mas.



Community participation

MRPP has developed a strategy of promoting sustainable natural resource management that includes active community participation. Through the establishment of Community Forest Rangers (CFRs), community participation can play a large part in the fields of forest protection (from illegal logging and fire threats), conservation and rehabilitation. Each CFR consists of between 15 - 20 members. As of November 2010, 14 member CFR units have been established.

To achieve active community participation, capacity and competency, interventions from the project as well as from related stakeholders are essential. Training (forestry techniques, appropriate agricultural technologies, etc.), public awareness, facilitation and provision of alternative income generating activities, as well as strengthening group institutional capacities are ongoing. The project is currently supporting poultry as an alternative income generating activity for all members of two CFRs. Village micro finance institutions are being established, enabling access to financial services. The support of self-reliance community groups is leading to strengthened institutions and member's capacities. New income generating activities and products will be introduced to contribute to continued poverty alleviation.

For the 2 villages of Muara Merang and Kepayang and their 6 sub-villages, the project will give benefits that affect around 5000 inhabitants.



Looking ahead, in close cooperation with local authorities, communities, and the private sector, the project will focus on strategies and institution building for peat forest management along with conservation. The institutions are now in place, but funds for REDD activities are lacking. Such funds are urgently needed to implement activities which will address the biggest threat to the forests, namely illegal logging and to bridge the transition from readiness to a true REDD project. Measures to restore degraded peat forest areas will continue to need finance.

Abbreviations:

BMU	German Federal Ministry of Environment, Nature Conservation and Nuclear Safety
BPK	<i>Bina Produksi Kehutanan</i> (Directorate General for Forest Production Management)
CFR	Community Forest Rangers
FMU	Forest Management Unit
GTZ	Deutsche Gesellschaft für Technische Zusammenarbeit
KPHP	<i>Kesatuan Pengelolaan Hutan Produksi</i> (Forest Management Unit)
MRPP	Merang REDD Pilot Project
MRV	Measurement, Reporting and Verification
MUBA	Musi Banyuasin District
PES	Payment for Environmental Services
REDD	Reduction of Emissions from Deforestation and Forest Degradation
REL	
SSFFMP	South Sumatra Forest Fire Management Project





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