Mawas Peatlands Conservation Area Project

Source(s):

Summary of draft project design document for Mawas peatlands conservation project

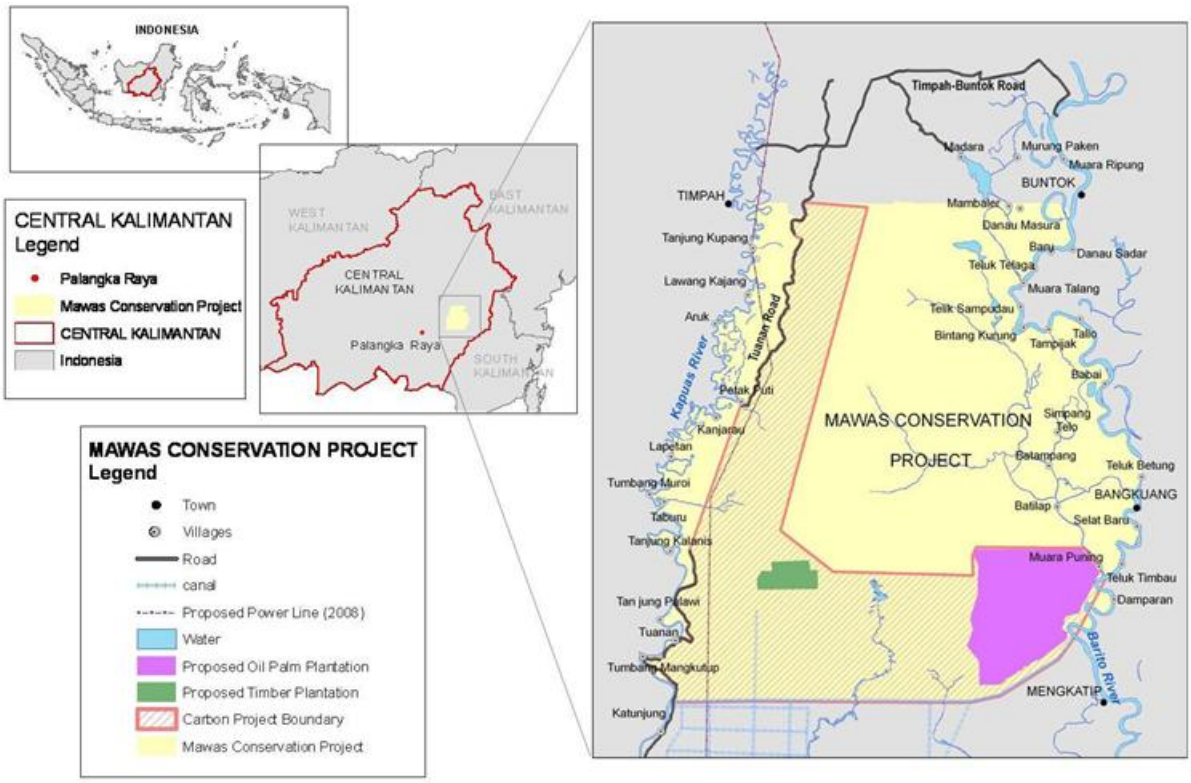
BOS Foundation, Brief Summary of Mawas Conservation Program Initiatives *2

Helping saving habitat for the endangered orangutan *3

Project location

Central Kalimantan, Indonesia

The Mawas Peatlands Conservation Project is located in southern Borneo in Central Kalimantan, Republic of Indonesia. The capital city of Palangka Raya is located ~60 km west of the south end of Mawas. Provinces in Indonesia are divided into districts, or kabupaten. The Mawas project area is split between Kabupaten Kapuas and Kabupaten Barito Salatan. Mawas is located in the northern portion of the 1.7 million ha ex-Mega Rice Project (MRP) (p. 2)



Forest area and types

Area: 240,000 hectares of peat swamp forest in southern Borneo (p. 1)

Mawas consists of lowland forest on deep peat that has developed over an extensive sedimentary plain that extends south to the Java Sea. Extensive coastal swamps have developed over this plain, mainly during the past 10,000 years, creating massive peat domes, and elevating the land surface.

Peat is the most significant carbon store and sink associated with Mawas. There are three large (up to 16 m thick) ombrogenous peat domes in the project area (p. 4). The peat soils are classified as tropohemists which are characterized as mainly organic, swampy and half decomposed. Tropohemist soils are acidic and have low levels of major and minor plant nutrients and are therefore poorly suited for most types of agriculture (p. 5).

More than 60 biodiversity studies by Indonesian and foreign graduate students document that Mawas is home to ~3,000 wild orangutans, 48 species on the IUCN Red List, 24 species listed by CITES and, one new frog species (p. 5).

Forest management and use context

Based on Presidential Instruction No.2, 2007, the overall Mawas area is to be designated to be conservation area (*2: p. 1).

The Mawas project area is classified as forest land owned by the Republic of Indonesia and managed by the Ministry of Forestry. Traditional land claims exist near the villages that border or are within the Mawas Conservation Area. However, there are no known traditional land claims within the carbon project boundary (p. 5).

While central government laws define the codified land ownership framework for the country, they are rarely considered by local people in areas like the Mawas project area. Tanah adat (traditional land) is still the primary basis for tenure and claiming rights to the land throughout rural areas of Kalimantan (p. 5).

There are two locations of proposed land use change within the project area: a 16,000 oil palm plantation and a 2,000 ha HTI pulpwood plantation (p. 3).

Rates and drivers of deforestation and degradation

Historical degradation rates from 1997 to 2003 were calculated based on radar imagery showing degraded areas at three points in time before the start of the project activity (1997, 2000, 2003). The rate of degradation over the first time interval (1997 to 2000) was 2.6% per year while the rate over the second time interval (2000 to 2003) was much higher at 8.9% per year (p. 8).

There are several conditions that threaten to degrade the area, including:

- Illegal logging and construction of small canals (tata) to float out the logs
- Peat drainage due to existing canals
- Wildfires
- Proposals for land use conversion to plantations on deep peat that will require deforestation and drainage and which are expected to result in burning for land clearing (p. 3).

The Mega Rice project led to the degradation of the peat dome. Development of many small canals in the dome body by illegal loggers exacerbates the condition (*2: p. 1). By the time the MRP was abandoned in 1999, more than 1/2 million ha of peatlands were deforested, 4,600 km of drainage canals were constructed to drain the peatlands, and an estimated 60,000 migrants moved to the area to work for the project (p. 2).

These conditions, combined with a severe El Niño event in 1997, resulted in extensive forest and peatland fires that burned 0.5 to 3.0 million hectares, mostly on peat. The fires burned to an average depth of 67 cm

and released at least one billion tonnes of carbon into the atmosphere (p. 2).

Project proponents (p. 2)

The project proponent is the Borneo Orangutan Survival Foundation. The project will be proposed jointly with the Province of Central Kalimantan to become a REDD-I forest carbon pilot project.

Implementation timeframe (p. 6)

The start date of the project is 2003 for Component A and 2005 for Component B. Although degradation and burning are simulated to begin in the year 2003 for Component B, fire prevention activities did not begin until 2005 and therefore, this is the year benefits are started.

The modeled project life is 30 years, with a reassessment of the baseline scenario every 10 years.

Project goals (p. 1)

The Mawas Peatland Conservation Project (Mawas) is a proposed carbon emissions avoidance, biodiversity and poverty alleviation project on 240,000 hectares of peat swamp forest in southern Borneo, Indonesia. The project will conserve carbon stores in deep peat in a designated carbon accounting area consisting of ~100,000 hectares by avoiding proposed land use changes and reducing fire incidence in the region.

The project proponent plans to help local communities prevent and control fires and to develop environmentally sustainable economic opportunities for improving their quality of life and prosperity.

Therefore, specific objectives of the project are to:

- Increase income and alleviate poverty of local communities by introducing and supporting sustainable economic development activities;
- Improve water quality by protecting peatlands that regulate stream flow, reduce erosion, and filter water;
- Contribute to climate change mitigation by avoiding land use change and fire in peat swamp forest, thereby reducing/avoiding GHG emissions;
- Enhance biodiversity conservation by protecting critical habitat for endangered species, such as the Bornean orangutan.

Implementation activities

The carbon accounting portion of the Mawas Peatlands Conservation Project has two greenhouse gas (GHG) mitigating components (p. 1):

- *Component A mitigates GHG by avoiding emissions from deforestation and land use change;*
- *Component B mitigates GHG by stopping or reducing anthropogenically-induced fires*

Implementation activities include:

- Participants will receive training in fires fighting and use of personal protective equipment.
- Mawas will negotiate cooperative work agreements with communities that choose to participate in the programs
- The Mawas programs are intended to transfer technology and knowledge that can be applied by the local people. The aerial monitoring of forest cover and carbon stocks will initially depend on use of foreign consultants but over time, it too can be transferred.
- The economic development and community capacity building programs rely on technologies proven in Indonesia. The programs facilitate training by experts in Indonesian government agencies, from Indonesian universities and potentially from Indonesian consultants. Where experts in local

communities exist, they are commissioned to train other communities (p. 16).

Programs already started by the project

Programs	2003-2005	2006
No. of seedlings produced	31,800	130,291
Planted area (ha)	79	82
No. of groups	6	21
No. of people participating	205	384
No. of communities participating	4	11
Planted area (ha)	-	79.64
No. of groups	-	9
No. of people participating	-	178
No. of communities participating	-	6
No. of ponds/karamba	1	64
No. of groups	1	13
No. of people participating	5	220
No. of communities participating	1	9
No. of pens	-	10
No. of groups	-	6
No. of people participating	-	92
No. of communities participating	-	3
No. of seedlings produced	-	48,400
Ha planted	-	0
No. of groups participating	-	12
No. of people participating	-	654
No. of communities participating	-	1

Actors' roles and responsibilities

Borneo Orangutan Survival Foundation	Project proponent and initiator. Main coordinating organization. Authorized to carry out the activities that will generate the carbon benefits under the terms of written agreements with the Ministry of Forestry and the province of Central Kalimantan (p. 5)
Province of Central Kalimantan	Proposing project, together with BOSF
Shell Canada	Project co-initiator
BOSF – Central Kalimantan Province Government Forum (TKPTP)	Responsible for governmental coordination
Winrock International	Assisted BOSF in developing a project design document (PDD) and new methodologies (*3)

Other partners involved in Mawas area management	Three party MoU for long term orangutan research in Tuanan Research Station with Universitas Nasional (UNAS) Jakarta and the Institute Museum of Anthropology of Zurich, Switzerland.
	Peat research in Bagantung Research Station with Sarvision – Dutch and Sarvision – Indonesia.

Community participation

Participation in the Mawas programs is strictly voluntary. Areas of traditional land use will be determined by participatory mapping. Programs will be customized to each community based on the local needs, abilities and traditions. Every effort will be made to work cooperatively with the communities (p. 16). *See "Benefit sharing"* for further discussion.

Project financing (*2: p. 2)

Mawas is funded by the Dutch Royal Government through its scheme of Central Kalimantan Peatland Project (CKPP) since 2006 until recently for fire management by village regulation, information system and community fire brigades; community development by capacity building and micro-financing; land rehabilitation by re-greening; hydrological restoration by canal blocking; raising awareness through publications and engagement and biodiversity preservation through population monitoring.

Based on an agreement between BOSF and Shell Canada Inc., Mawas Conservation Program has started the voluntary carbon scheme with Shell Canada since the end of 2005 until July 2008. From this agreement, carbon accounting has been conducted using 2 emission avoidance scenarios. The result of this agreement is the completion the Project Design Document of BOSF-Shell.

Mawas program is also supported by other funding of BOS International and the Micro Fund of the German Embassy, Jakarta Office.

Benefit sharing

The Mawas programs are designed to improve livelihoods for local communities and there are no significant adverse impacts anticipated. The expected positive impacts include: direct project-related employment, economic gains through micro credit and livelihoods enhancement programs; reduced air pollution and respiratory problems from fires, improved public services that should reduce child and maternal mortality, better stream flow regulation, improved downstream water quality, improved conditions for downstream fisheries integrity, and transfer of carbon benefit measurement technology/techniques to Central and Provincial governments.

Local people will continue to have access to traditional lands which will be determined through participatory mapping and will be respected in the establishment of the protected area.

Mawas promotes sustainable development by creating opportunities for improving the quality of life of project-affected and neighboring communities, while conserving biodiversity and carbon sink capacity. In exchange for foregoing land conversion and intensive logging, local communities receive economic benefits through:

1. Employment for fire training to prevent and control fires. A bonus system may be implemented for communities where there are no fires.

2. Employment for forest regeneration activities.

3. Opportunity to participate in sustainable agricultural and livelihoods diversification programs.

4. Added value to non-timber forest products (NTFPs) as a result of training provided by artisans.

5. Improved availability and scope of health services.

6. Improved understanding of environmental issues and their significance for quality of life and sustainable livelihood opportunities (p. 15).

Carbon ownership remains to be resolved within Indonesia (p. 5).

Emissions and removals with and without project (p. 6-14)

Baseline and Monitoring Methodologies

There are two components to the baseline methodology. The first, Component A, addresses GHG emissions expected to occur from deforestation and land use change without the Mawas project. The second, Component B, estimates GHG emissions that are likely to result from anthropogenically-induced fires without the Mawas project.

There are no UNFCCC approved baseline methodologies available at this time to assess the two baseline components for Mawas project because these activities are currently not eligible to the UNFCCC CDM. Two new methodologies, 'Baseline and monitoring methodology for conservation projects that avoid land use conversion in peat swamp forests' and 'Baseline methodology for conservation projects that prevent or reduce anthropogenically-induced fire in peat swamp forests' are proposed. (*These have been developed in CDM format)*

For Component A, two land use strata were derived:

1. Proposed HTI plantation (2,000 ha)

2. Proposed oil palm plantation (16,000 ha)

For Component B, the carbon project boundary (excluding areas included under Component A) was divided into three strata according to the vegetation map derived from high resolution aerial imagery:

1. intact peat swamp forest; *x* ha

2. degraded peat swamp forest: x ha

3. bare soils/burned areas: x ha

Historical degradation rates from 1997 to 2003 were calculated based on radar imagery showing degraded areas at three points in time before the start of the project activity (1997, 2000, 2003). The rate of degradation over the first time interval (1997 to 2000) was 2.6% per year while the rate over the second time interval (2000 to 2003) was much higher at 8.9% per year. Field visits to degraded areas confirm that fire was partially responsible for this degradation, and that degradation increases the forests susceptibility for burning.

Area of Degradation

The areas within the project boundary that would be degraded under the baseline scenario were simulated using the GEOMOD model. The degraded areas within the project boundary that would burn under the baseline scenario were simulated using the Multi-Objective Land Allocation procedure.

Degradation rates were calculated based on land cover maps derived from radar imagery showing degraded areas at three points in time inside the Mawas project area (1997, 2000, 2003). A linear extrapolation of the regional rate of degradation was applied as the baseline scenario as 5.8% per year.

To determine the baseline land-use / land-cover scenario for each stratum, factors ("drivers") were defined which influence the location of degradation. These drivers were used to create a "suitability for degradation" map. The driver images that were assumed possibly to influence the location of degradation within the carbon project boundary (CPB) were:

1) Distance from rivers
2) Distance to transportation (canals and roads)
3) Distance to roads
4) Distance to canals
5) Distance to sawmills
6) Distance to villages
7) Distance to already degraded forest

A potential for degradation (PFD) map was then created by masking out the degraded forest in the reference map of 2003 from the suitability map, and areas of forest and degraded forest from 2003 to 2034 were simulated using the estimated degradation rate of 5.8% per year. Since project activities for Component B (fire prevention activities) started in the year 2005, project emissions during these years are assumed to be equal to baseline emissions and therefore the project's carbon benefits for the first two years were assumed to be zero. The area of forest simulated to become degraded within the CPB over the 30-year project life from 2005-2034 is **41,695** ha, or approximately 40% of the total area within the CPB. (Areas of planned land use change under Component A add another 18,000 ha).

Area of burning

After GEOMOD was used to predict the conversion of intact to degraded forest over the project life, the location of degraded forest that burns in each year of the baseline was estimated using the Multi-Objective Land Allocation (MOLA) module in Idrisi Andes GIS and a regionally-specific burn rate of 9.8% per year. A new suitability for burning map was created using an equally weighted combination of all heuristic driver images listed above for degradation: (1) distance from rivers, (2) distance to transportation (canals, and roads), (3) distance to roads and (4) distance to channels, (5) distance to sawmills, (6) distance to villages, and (7) distance to degraded forest.

Four assumptions were made to determine the location and quantity of burned degraded forest:

- First, only the degraded forest category was considered to contribute to the quantity of the burned category.
- Second, based on research from NASA scientists that showed a link between recent El Niño events and increased fire occurrence in Indonesia, degraded forest was allowed to burn during recent El Niño years (2003, 2005 and 2007) and every five years thereafter. Five years was assumed to be the average frequency of an El Niño event, based on NOAA's El Niño index for the years 1950-2007.
- Third, a peat depth surface map was created from peat depth contour lines provided by SarVision Indonesia
- Fourth, the degraded forest was allowed to re-burn in subsequent El Niño years, provided that peat depth was >0, before moving on to burn the pixels on the map with the next highest suitability score on the suitability for burning map

The total CO2e emissions from aboveground biomass burning for the 30-year life of project (2005-2034) are **6,163,656 t CO2e** and the total CO2e emissions from peat burning for the 30-year project life (2005-2034) are **76,448,290 t CO2e** .

Therefore, total carbon emissions due to anthropogenically-induced fire are estimated as **86,611,946 Mt CO2e**, with only 7% of the total emissions due to aboveground biomass burning and the other 93% of the total emissions due to peat burning. This is likely a conservative estimate, because emissions from forest degradation and emissions from small fires that may occur between the large El Niño year fires are not included in the estimates.

Additionality

A four step process in accordance with the UNFCCC additionality tool was followed to demonstrate that the proposed project activity is additional and not the baseline scenario. This process involves:

1. Identification of alternatives to the project activity consistent with current laws and regulations.

2. Investment analysis

3. Barriers analysis

4. Common practice analysis

As this is a project that reduces emissions from deforestation, the additionality is obvious: halting deforestation. Any development or burning that is avoided on deep peat is critical towards reducing GHG emissions.

No fire prevention activities similar to the proposed project activity have been implemented previously or are currently underway in the project area except by the project proponent.

Estimation of *ex ante* Net Anthropogenic GHG Removals by Sinks and Estimated Amount of Net Anthropogenic GHG Removals by Sinks

The total carbon offsets reach 125,075,520 tons CO2 over the life of the project.

Yr of Project	Carbon offset Component A (t CO2e)	Carbon offsets Component B (t CO2e)	Total Carbon offsets (t CO2e)	Leakage (project emissions only) (t CO2e)	Net carbon offsets (t CO2e)
2003	2,301,041	1,349,609	3,650,650	169	3,650,481
2004	1,970,827	2,187,845	4,158,672	213	4,158,459
2005	2,201,732	2,233,815	4,435,547	191	4,435,356
2006	2,454,547	2,156,584	4,611,131	191	4,610,940
2007	1,150,455	2,452,195	3,602,650	191	3,602,459
2008	1,074,836	2,465,230	3,540,066	191	3,539,875
2009	1,003,129	2,560,893	3,564,022	191	3,563,831
2010	957,984	2,859,225	3,817,209	191	3,817,018
2011	1,022,649	2,871,626	3,894,275	191	3,894,084
2012	991,042	2,894,301	3,885,343	191	3,885,152
2013	954,642	3,076,551	4,031,193	191	4,031,002
2014	975,967	3,153,102	4,129,069	191	4,128,878
2015	1,001,588	3,182,566	4,184,154	191	4,183,963
2016	1,028,806	3,226,715	4,255,521	191	4,255,330
2017	1,055,827	3,170,313	4,226,139	191	4,225,948
2018	1,081,531	3,169,301	4,250,832	191	4,250,641
2019	1,189,457	3,362,484	4,551,940	191	4,551,749
2020	1,179,335	3,383,118	4,562,453	191	4,562,262
2021	1,148,806	3,345,490	4,494,296	191	4,494,105
2022	1,165,577	3,273,737	4,439,313	191	4,439,122
2023	1,180,197	3,224,363	4,404,560	191	4,404,369
2024	1,192,848	3,192,055	4,384,903	191	4,384,712
2025	1,203,728	3,163,695	4,367,423	191	4,367,232
2026	1,213,041	3,137,927	4,350,968	191	4,350,777
2027	1,305,155	3,105,118	4,410,273	191	4,410,082
2028	1,280,285	3,039,939	4,320,224	191	4,320,033
2029	1,236,321	3,002,273	4,238,594	191	4,238,403

2030	1,241,061	2,940,618	4,181,679	191	4,181,488
2031	1,245,046	2,839,396	4,084,442	191	4,084,251
2032	1,248,388	2,805,320	4,053,707	191	4,053,516
Total	**38,255,848**	**86,825,401**	**125,081,250**	**5730**	**125,075,520**

Leakage

There is no leakage calculated for Component A of the baseline scenario. The Governor's Spatial Plan of 2003 targets specific parcels of land for plantation establishment. The project proponents have removed a proportion of this fixed area designated for plantations and are seeking permanent protected status for the Mawas area from the Indonesian government. Furthermore, because this is not an agricultural scenario, it is unlikely that local residents will migrate to new areas and clear land elsewhere. Therefore, it is assumed that there is no leakage associated with avoiding plantations in the Mawas area.

For Component B, the only source of leakage that was estimated was GHG emissions caused by vehicle fossil fuel combustion due to transportation of staff and/or materials to *and/or from project sites.* Total leakage for Component B for 30 years is estimated at 5,730 t CO2e.

Monitoring

Monitoring Plan (p. 14)

- The parcels of land chosen to be included in the project will be located and delineated using a GIS.
- Changes in the project boundary will be monitored during each monitoring interval via high resolution aerial imagery collection and analysis and/or field survey.
- Stratified sampling will be used for more efficient sampling of the project area. The key stratification will be by project activity. Sub-strata may include forest type, peat depth, etc. Within all project areas, strata boundaries will be recorded with a GIS.
- The initial strata will be based on the following factors:
  1. Land use threat: Oil palm plantation / Acacia plantation / Uncontrolled fire
  2. Baseline land cover condition: Intact forest / Degraded forest / Burned land
- After the first monitoring period, post-stratification may be conducted to address changes in strata or differences in carbon stocks. The following factors will be considered in post-stratification:
  1. Data from land use change within the project boundary such as illegal logging, deforestation, fire
  2. Variation in carbon stock change for each stratum after first monitoring event. Strata will be grouped into one strata if they have similar carbon stock, carbon stock change and spatial variation.
- The baseline carbon stock changes do not need to be monitored after the project is established, because the accepted baseline approach assumes continuation of existing changes in carbon pools within the project boundary from the time of project validation.

Reporting

No data

Verification

No data

Risks and risk management

- The potential negative socio-economic impacts include competition for benefits and natural resources by existing people and migrants seeking access to project-related social services/benefits and increased economic prosperity (p. 15).

- Mawas carbon benefits will be measured and documented using proven methodologies, but will only be marketed as voluntary credits. Based on a risk analysis by the Verifier, a buffer account may be created in which a certain percentage of the project‟s carbon credits will be deposited.

Progress and plans (http://winrock.org/fact/facts.asp?CC=5698&bu=)

- Project Design Document (PDD) produced in Clean Development Mechanism (CDM) format, completed August 2008
- Methodologies underwent independent review and verification in April 2009 by Rainforest Alliance. Several corrective actions are currently being addressed by Winrock (*3).

Links:

Project-related documents

Summary of draft project design document for Mawas peatlands conservation project

BOS Foundation: Brief Summary of Mawas Conservation Program Initiatives

Others

Helping saving habitat for the endangered orangutan

CIFOR(2009): Emerging REDD+