PENGELOLAAN LAHAN GAMBUT TERDEGRADASI MELALUI INOVASI TEKNOLOGI DAN PEMBERDAYAAN MASYARAKAT

The Management of Degraded Peatlands Throught Technology Innovation and Community Empowerment

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BADAN PENELITIAN DAN PENGEMBANGAN PERTANIAN
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AGENCY FOR AGRICULTURAL RESEARCH AND DEVELOPMENT
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THE MANAGEMENT OF DEGRADED PEATLANDS THROUGHT TECHNOLOGY INNOVATION AND COMMUNITY EMPOWERMENT

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KATA PENGANTAR

PREFACE

Dr. Ir. Haryono, M.Sc.

Perubahan iklim yang terjadi diakibatkan oleh emisi Gas Rumah Kaca (GRK), alih fungsi hutan dan lahan gambut terdegradasi berkontribusi besar terhadap emisi GRK, masing-masing sebesar 48 persen dan 13 persen.

Fakta lapang menunjukkan sekitar 15-20 persen lahan gambut sudah dimanfaatkan oleh masyarakat dan umumnya cukup produktif dan menguntungkan. Namun pemanfaatan lahan gambut dengan sistem

Climate change has been identified due to green house gas emissions (GHG), the conversion of forests and degraded peatlands contribute greatly to GHG emissions, respectively 48 percent and 13 percent.

In the field, there is fact that about 15-20 percent of peatlands has been exploited by people and it generally quite productive and profitable. However, the exploitation of peat with management systems that are not environ-

pengelolaan yang tidak ramah lingkungan akan berdampak besar kontribusi emisi GRK. Tantangannya sekarang dan ke depan adalah bagaimana emisi GRK dari lahan gambut dapat dikurangi, sekuestrasi karbon dan produktivitasnya dapat ditingkatkan?

Upaya untuk menjawab tantangan tersebut, Badan Litbang Pertanian bekerjasama dengan Bappenas yang didanai oleh Indonesia Climate Change Trust Funds (ICCTF), telah melaksanakan Demplot Pengelolaan Berkelanjutan Lahan Gambut Berbasis Karet di Desa Jabiren Kabupaten Pulang Pisau Kalimantan Tengah, seluas 5 ha. Hasil demplot ini menunjukan bahwa emisi GRK pada lahan gambut berbasis karet dapat diturunkan hingga mencapai 45-49 persen dengan mengaplikasikan inovasi pengelolaan air, pemberian amelioran dan penanaman tanaman sela nanas.

Inovasi pada Demplot ICCTF Jabiren tersebut telah direplikasikan ke kebun karet Kelompok Tani Panenga di Desa Jabiren seluas 100 ha dibawah bimbingan dan pendampingan Balai Pengkajian

mentally friendly would have a greater contribution of GHG emissions. The challenge for both today and future is how the GHG emissions come from peatlands can be reduced, while carbon sequestration and productivity can be improved.

In order to overcome these challenges, the Agency for Agricultural Research in collaboration with Bappenas funded by the Indonesia Climate Change Trust Fund (ICCTF) has conducted demonstration plots for Sustainable Management of Peatlands Based on Rubber in Jabiren, Pulang Pisau district, Central Kalimantan, covering an area of 5 ha. The results of this assessment showed that GHG emissions of peatlands on the basis of rubber can be reduced up to 45-49 percent by applying innovative of water management, ameliorant application, introduction of intercroping system using pineapple.

Technology innovation on the demonstration plot of ICCTF of Jabiren has been replicated to rubber plantation of Farmers Group "Panenga" in with total areas of 100 ha under the guidance

Teknologi Pertanian (BPTP) Kalimanan Tengah (UPT Badan Litbang Pertanian yang berada di daerah). Kegiatan ini adalah kegiatan khusus REDD+ bekerjasama antara BPTP Kalimantan Tengah dengan UNDP yang difasilitasi oleh Sekretariat Bersama REDD+ Provinsi Kalimantan Tengah.

Buku "***Pengelolaan Lahan Gambut Terdegradasi Melalui Inovasi Teknologi dan Pemberdayaan Masyarakat***" berbasis karet rakyat dan tanaman sela dilakukan dengan pendekatan pemberdayaan masyarakat ini diharapkan memberikan gambaran dan bermanfaat bagi pembaca.

Terima kasih saya sampaikan kepada Gubernur Kalimantan Tengah (Dr. Hc. Agustin Teras Narang, SH), Ketua Satgas REDD+ (Prof. Dr. Kuntoro Mangkusubroto), Kepala Sekretariat Bersama REDD+ Provinsi Kalimatan Tengah (Ir. Mursid Marsono) dan Ketua serta anggota Kelompok Tani Panenga dan semua pihak yang telah memberikan dukungan dalam pelaksanaan.

and mentoring from Assessment Institute for Agricultural Technology (AIAT) of Central Kalimantan (Implementation unit of IAARD). This activity is specifically belong to REDD + in collaboration between AIAT) of Central Kalimantan with UNDP facilitated by Joint Secretariat of REDD + for Central Kalimantan Province.

Book "***The Management of Degraded Peatlands Throught Technology Innovation and Community Empowerment***" on the basis of smallholder rubber plantation and intercrops performed with community empowerment approach is released in order to provide an overview and benefit to the reader.

I have to say thanks to the Governor of Central Kalimantan (Dr. Hc. Agustin Teras Narang, SH), Chairman of the REDD + Task Force (Prof. Dr. Kuntoro Mangkusubroto), Head of the Secretariat of the Joint REDD + Central Kalimantan Province (Mr. Mursid Marsono) and the Chairman and members of the Group Tani Panenga and all those who have provided support in the implementation.

Saya menyampaikan apresiasi kepada Tim Penyusun buku ini semoga tetap selalu berkarya, berbagi pengalaman dan informasi.

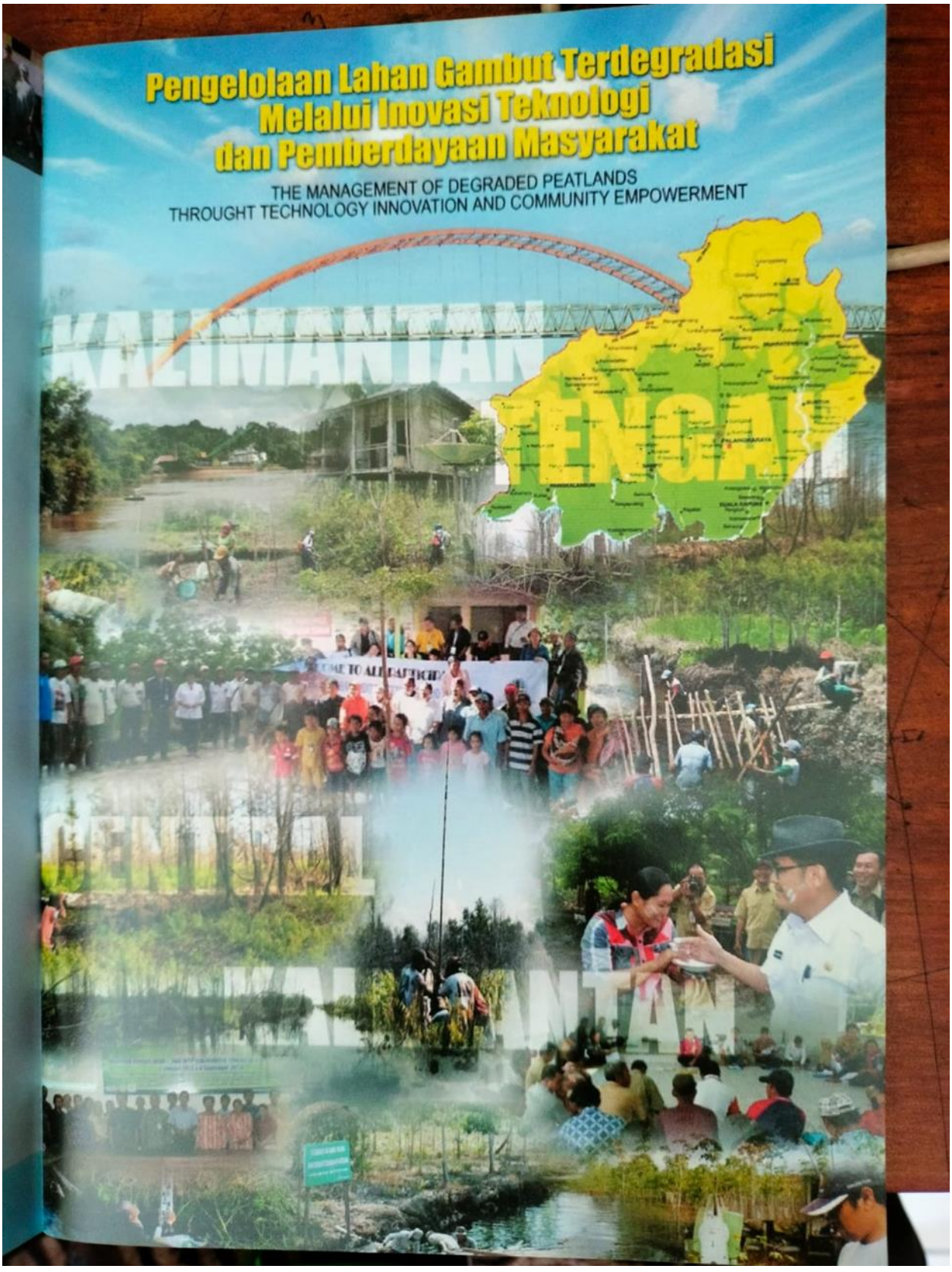
I express highly appreciation to Redactor Team for this book, may remain always work, share the experiences and information.

Jakarta, Januari 2014

Kepala Badan Litbang Pertanian/

Director General IAARD

Dr. Ir. Haryono, M.Sc.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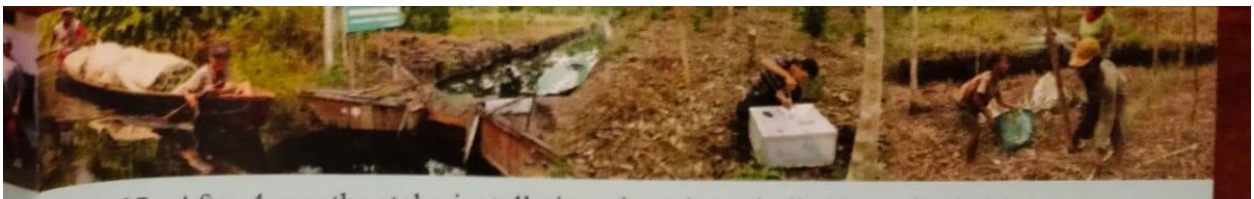

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Duta Besar Norwegia Mr. Stig Traavik sedang mengunjungi lokasi REDD+ yang dikelola BPTP Kalimantan Tengah (16 Desember 2013).
The ambassador of Norway, Mr. Stig Traavik was visiting the location of Redd+ managed by AIAT of Central Kalimantan (16th December 2013)

BAB I
PENDAHULUAN

Ekosistem rawa gambut tergolong ekosistem rapuh, artinya gampang rusak namun sulit pulih kembali seperti semula (Firmansyah, 2013). Ekosistem tersebut memiliki resiliensi (*Resilience*) rendah yaitu rendahnya kemampuan tanah kembali pulih secara struktural maupun fungsional setelah mengalami degradasi. Resiliensi tanah berhubungan dengan kualitas tanah yang menjadi kunci unsur kelestarian (Lal, 1995; Eswaran, 1994, Seybolt *et al*. 1999).

Deforestasi dan degradasi senantiasa akan terjadi, karena daya dukung ekosistem rapuh senantiasa dieksploitasi penduduk setempat. Selain itu tekanan terhadap ekosistem rapuh makin berat karena meningkatnya populasi maupun tuntutan kebutuhan ekonomi masyarakat yang makin tinggi.

Eksploitasi ekosistem rapuh dengan daya dukung lemah senantiasa memerlukan advokasi dan sosialisasi pemanfaatannya secara bijak. Penyadaran kepada aspek sosial

CHAPTER I
INTRODUCTION

The ecosystem of peat swamp can be considered as fragile ecosystems, this is mean that it can be easily broken and difficult to be regenerated back to original (Firmansyah, 2013) . The ecosystem has low resilience, low capacity of the soil to recover structurally and functionally after degradation. The soil resilience is closely associated with soil quality as key element of sustainability (Lal, 1995; Eswaran, 1994, Seybolt *et al*., 1999).

Deforestation and degradation will always occur because the capacity of fragile ecosystems is always exploited by local community. Besides that, the pressure on fragile ecosystems become more severe because of the increasing of population and higher economic needs of society as well.

Exploitation of the fragile ecosystem with the weak carrying capacity always require wisely advocacy and socialization of utilization. Awareness to the social aspects to maintain ecosystems generally takes a long time, until the resulting attitude of keeping

kemasyarakatan untuk menjaga ekosistem tersebut umumnya memerlukan waktu lama, hingga timbul sikap menjaga eksositem rapuh tumbuh dan menjadi budaya dari setiap individu masyarakat.

Kegiatan REDD+ yang dikelola Balai Pengkajian Teknologi Pertanian Kalimantan Tengah terletak di kawasan lahan gambut yang mengalami degradasi berat. Lokasi kegiatan terletak di kawasan eks PLG (Pengembangan Lahan Gambut) satu juta hektar di kawasan Handil Panenga. Lokasi tersebut dikelola oleh Kelompok Tani Panengan di Desa Jabiren, Kecamatan Jabiren Raya, Kabupaten Pulang Pisau.

Luas kawasan Handil (saluran drainase utama) Panenga di Desa Jabiren diperkirakan 1.200 ha, handil tersebut membentang sejauh 6 km dengan lebar 3 m dan berkedalaman 2 m. Handil Panenga terbagi oleh Rei-rei (saluran drainase penunjang) sebanyak 18 buah dengan lebar 1-2 m dan dalam 1-1,5 m pada posisi tegak lurus dikiri dan kanan handil dengan panjang masing-masing rei sekitar 1 km. Air di Handil Panenga bermuara ke Sungai Kahayan yang jaraknya 0,5 km.

Hulu handil berjarak kurang lebih 500 m dari Saluran Primer Induk dari eks Proyek Pengembangan Lahan Gambut Sejuta Hektar (*Rice Mega*

the fragile ecosystem appears and become the culture of each individual community.

The action of REDD+ was performed by Assessment Institute for Agricultural Technology of Central Kalimantan located in peatland areas with severe degradation. The main assessment was located in the ex PLG (Peat Land Development) one million acres in Handil Panenga. This location was managed by Farmer Group "Panengan" in Jabiren, sub district Jabiren Raya, Pulang Pisau district.

The Handil Panenga (as main drainage channel), with total area of 1,200 ha, lies in the region along the 6 km with a width of 3 m and a depth of 2 m. Handil Panenga was then divided by some "rei's" (drainage channels support), consisting of 18 rei's with a width of 1-2 m and a depth of 1-1.5 m, in the upright position at both side of main drainage channel with a length of 1 km per each. The water come from Handil Panenga flowing into Kahayan river located 0.5 km from main channel.

The headwaters of "Handil" located approximately 500 m from the main primary channel of Mega Rice Project that began in the issuance of the Presidential Decree No 82/1995. The open-

Project) yang dimulai sejak dikeluarkannya Keputusan Presiden No. 82/1995. Saluran drainase yang dibuka terdiri dari:

1. Saluran Primer Induk sepanjang 2 x 111 km, berukuran lebar 25 m dan dalam 6 m.
2. Saluran Primer Utama sepanjang 474 km dengan ukuran lebar 25 m dan dalam 5 m.
3. Saluran Sekunder sepanjang 1.512 km dengan ukuran lebar 15 m dan dalam 3 m.
4. Saluran tersier sepanjang 3.989 km, lebar 8 m dan dalam 3 m.

Mega proyek tersebut mengalami berbagai masalah sehingga dihentikan secara resmi melalui Keputusan Presiden No. 80/1999. Pada tahun 2007 melalui Instruksi Presiden No 2/ 2007 diupayakan percepatan rehabilitasi dan revitalisasi kawasan tersebut, namun tidak berjalan dengan baik.

Jenis tanah yang umum di kawasan Handil Panenga adalah gambut. Kedalaman gambut bervariasi dari sangat dangkal hingga sangat dalam. Kubah gambut terdapat disekitar rei 14 dengan kedalaman lebih dari 6 m.

Aspek-aspek kelestarian di ekosistem rapuh perlu karakterisasi dan diprioritaskan penanganannya, dan REDD+ wajib hukumnya

ing drainage channel consists of:

1. Main channel, along 2 x 111 km, with dimension, width 25 m and depth 6m.
2. Main primary channel, with dimension, length 474 km width 25 m and depth 5m.
3. Secondary channel, with dimension length 1.512 km width 15 m and depth 3 m.
4. Tertiary channel, with dimension length 3.989 km, width 8 m and depth 3 m.

This Mega project has faced a variety of problems so that it was officially terminated by the Presidential Decree No 80/1999. In 2007, through Presidential Instruction No. 2/2007, accelerated rehabilitation and revitalization of the area was established, but did not go well.

The land surrounding areas of Handil Panenga is dominated by peat. It may vary from shallow to very depth. The peat dome is found at rei 14 with depth more than 6 meters.

Aspects of sustainability in fragile ecosystems need to be characterized and prioritized by the REDD+ with its role and great responsibility on the frontline.

Panenga Handil area was managed by 162 members of Farmers Group "Panenga" who is also resi-

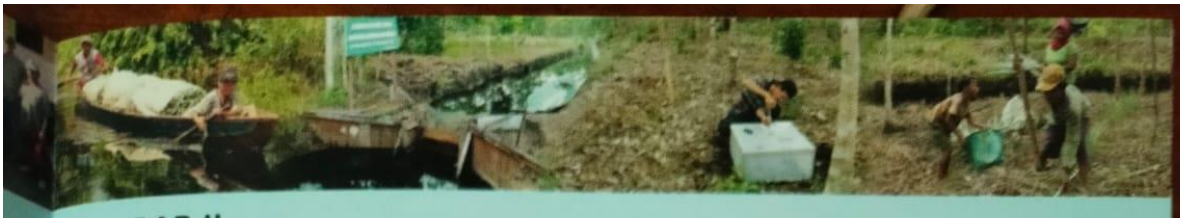
mengambil peran dan tanggung jawab lebih besar di Garda Terdepan.

Kawasan Handil Panenga dikelola oleh 162 orang anggota Kelompok Tani Panenga yang juga merupakan penduduk Desa Jabiren. Umumnya mata pencaharian utama anggota Kelompok Tani Panenga adalah petani yang mengelola kebun karet dengan luasan 1-5 ha. Produksi karet berupa lump hanya 25 kg/ha/sadap dari produksi optimal 100 kg/ha/sadap. Produksi karet dijual dipedagang pengumpul desa dengan harga berfluktuasi antara Rp. 7.000 – Rp. 14.000 per kilogram.

Tujuan tulisan ini memberikan gambaran kegiatan REDD+ di Handil Panenga, Desa Jabiren, Kabupaten Pulang Pisau, Provinsi Kalimantan Tengah, Indonesia yang dikelola Balai Pengkajian Teknologi Pertanian (BPTP) Kalimantan Tengah, sebagai Unit Pelaksana Teknis dari Badan Penelitian dan Pengembangan Pertanian, Kementerian Pertanian.✪

dent of Jabiren. Generally, the main livelihood of Farmers Group "Panenga" is farmers that manages the rubber plantation with an area of 1-5 ha. Rubber production in the form of lump is still low that is only 25 kg/ha/tapping, comparing to the optimal production, 100 kg/ha/tapping. The price of rubber production at collectors levels may vary with fluctuate prices between Rp. 7,000 - Rp. 14,000 per kilogram.

This paper was conducted in order to provide an overview of REDD+ in Handil Panenga, Jabiren village, Pulang Pisau district, Central Kalimantan Tengah province, Indonesia, performed by Assessment Institute for Agricultural Technology (AIAT) of Central Kalimantan as the Technical Unit of the Agency for Agricultural Research and Development, Ministry of Agriculture.✪



BAB II
SEJARAH DESA JABIREN: DEGRADASI EKOSISTEM

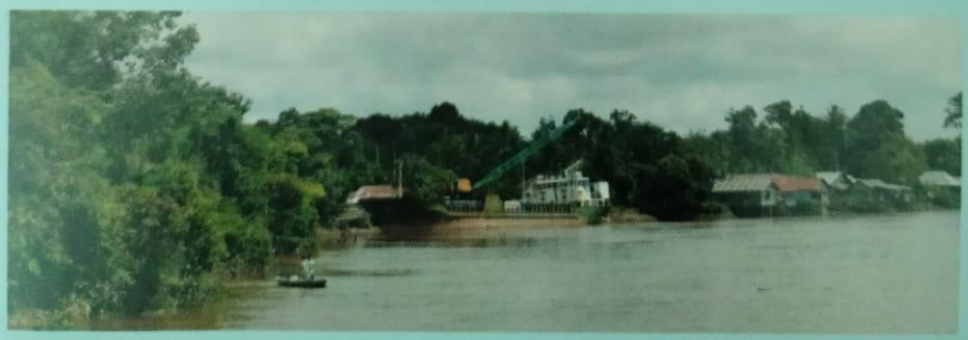
CHAPTER II
THE HISTORY OF JABIREN: DEGRADED ECOSYSTEM

Asal Usul Desa Jabiren

Menurut Berson (2010) Desa Jabiren berasal dari nama seseorang yaitu Biren yang tinggal pertama kali dihilir sungai yang sekarang ini disebut Sungai Jabiren. Perkampungan Desa Jabiren terletak dipinggir Sungai Kahayan, dan memiliki keunikan karena di lokasi tersebut aliran Sungai Kahayan berbentuk lipatan rotan atau setengah lingkaran, serta memiliki teluk yang sangat dalam (Gambar 1). Berdasarkan kondisi tersebut dibuatlah nama menggunakan bahasa Kayangan/ Sangiang yang berbunyi: Lewu Ulek Lanting Rundung Banama Tabajakan

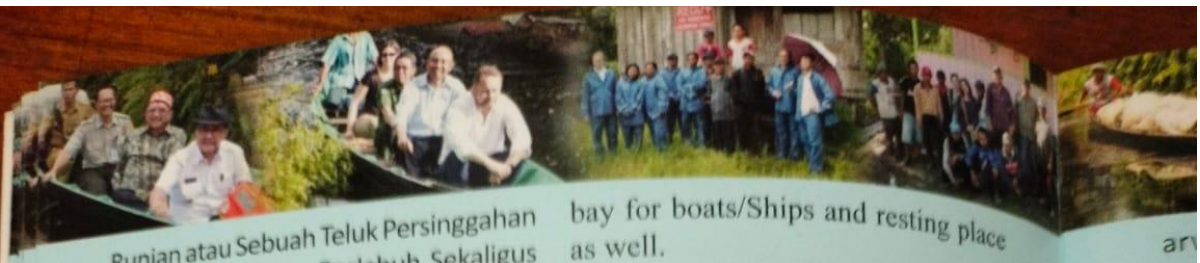
The Origins of Jabiren

According to Berson (2010), the "Jabiren" comes from the name of a person called "Biren" who lived first at downstream river now called Jabiren river. The village of Jabiren lies on river side of Kahayan river, and it has unique location because this village was located at river flow path which has the form of shaped rattan or semicircular folds, and has a very deep bay (Figure 1). Based on this condition, it was then appear the name using language of Kayangan/Sangiang which reads: Lewu Ulek Lanting Rundung Banama Tabajakan Runjan, it means a stopover



Gambar 1. Lokasi teluk Sungai Kahayan di Desa Jabiren yang digunakan untuk perahu atau kapal bersandar dan beristirahat (23 Maret 2013).

Figure 1. The location of river bay of Kahayan river in Jabiren as a stopover bay for boats/ships and resting place as well (23th March 2013).



Runjan atau Sebuah Teluk Persinggahan Perahu/Kapal yang Berlabuh Sekaligus Tempat Beristirahat.

Bermukimnya warga di hilir Sungai Jabiren dan tepian Sungai Kahayan merupakan periode dimulainya kehidupan baru yang aman, terlepas dari zaman Asang (Gambar 2).

bay for boats/Ships and resting place as well.

The existence of settlement in downstream river and river side of Kahayan river was considered as starting new safe life period, aside from age of Asang (Figure 2).

Gambar 2. Rumah tertua yang tersisa namun masih digunakan di Desa Jabiren (23 Maret 2013).

Figure 2. The remaining oldest house in Jabiren that is still used (23th March 2013).

Gambar 3. Sandung Tunggal bertahunkan 1935 (23 Maret 2013).

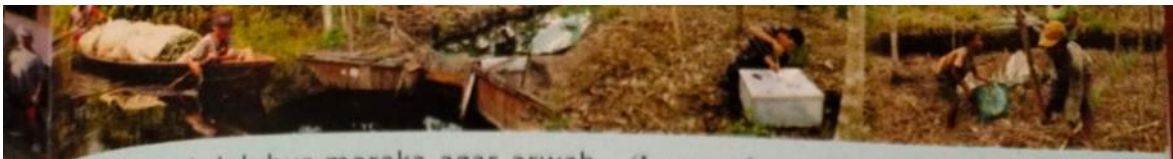
Figure 3. The structure of "Sandung Tunggal" built in 1935 (23th March 2013).

Zaman Asang adalah zaman dimana pada kurun waktu tersebut, orang Dayak yang menganut Kaharingan (kepercayaan agama helu/dahulu) senantiasa konflik antar suku. Konflik tersebut tidak lain karena dalam melakukan upacara adat Tiwah memerlukan kepala manusia. Kepala tersebut digunakan sebagai alas apabila mereka mendirikan Sandung Tunggal (tempat menyimpan tulang belulang) (Gambar 3).

Upacara Tiwah adalah kegiatan mengangkat tulang belulang para

The age of Asang is the period in which the Dayaks who embrace Kaharingan (religious of helu as first religion) always face inter-ethnic conflict. The conflict is rooted from doing ceremonial "Tiwah" that require human head. The head is used as a base when they set up a "Sandung" (a place to store the bones) (Figure 3).

The ceremony of "Tiwah" is activities of lifting bones of their ancestors so that the souls can go to heaven



arwah leluhur mereka agar arwah dapat masuk surga (Lumpat Lewu Tatau). Filosofi kepala manusia sebagai alas Sandung Tunggal adalah agar arwah kepala yang ditanam tersebut ikut serta masuk ke akhirat bersama arwah yang diupacarakan, sekaligus dijadikan sebagai budaknya (Jipen).

Setelah perjanjian Tumbang Anoi (1894), maka Tiwah tidak lagi menggunakan kepala manusia, namun diganti dengan hewan seperti kerbau, sapi, babi, ayam.

Periode Sebelum 1972: Ekosistem Hutan Lestari

Menurut seorang tokoh masyarakat Hermanus Tuwe yang berusia 72 tahun, sebelum tahun 1972 ekosistem Desa Jabiren masih berupa hutan belantara dengan tinggi pohon 30 m atau lebih, dan kondisi wilayah berupa lahan rawa dengan tinggi air lebih 1 m, keragaman hayati tinggi, belum ada pembuatan saluran drainase, belum ada kebakaran hutan dan lahan. Mata pencaharian penduduk Desa Jabiren saat itu adalah nelayan dan pekebun karet di tepian Sungai Kahayan.

Periode 1972-1995: Pembalakan Kayu Hutan

Tahun 1972 - 1995 di Desa Jabiren mulai beroperasi perusahaan HPH

(Lumpat Lewu Tatau). Philosophy of the human head as base of Sandung Tunggal is head planted so that the souls are participating into the after-life together with other spirits, as well as serve as a slave (Jipen).

After the agreement of Tumbang Anoi (1894), then Tiwah no longer use human head, however, it was replaced by animals such as buffalo, cows, pigs, and chicken.

Period before 1972: Sustainable Forest Ecosystem

According to local community leader, Hermanus Tuwe, 72 years old, before 1972, the ecosystem aroud the Jabiren is still wilderness with some tree height of 30 m or more, and the land was dominated by swamp with water level more than 1 meter high. High biodiversity was found in this areas and there is no drainage channel and there is no forest fire as well. At this time, rural livelihoods include fishing and rubber planters at riverside of Kahayan river.

Period 1972-1995: Forest Logging

In the year of 1972 to 1995, a company based on forest concession, PT. Jayanti Jaya started to operate by cut-

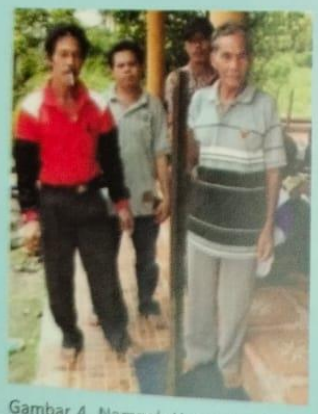
(Hak Pengusahaan Hutan) yaitu PT. Jayanti Jaya yang memiliki hak memotong kayu ramin, namun saksi mata dari penduduk Desa Jabiren mengatakan juga jenis kayu-kayu lainnya.

Pada periode ini sebagian besar penduduk Desa Jabiren bermata pencaharian pembalak kayu hutan, karena pemasaran kayu sangat mudah. Batas wilayah konsesi penebangan kayu masyarakat adalah radius 5 km dari tepi Sungai Kahayan, sedangkan konsesi penebangan kayu perusahaan diatas lokasi tersebut. Untuk mengangkut hasil tebangan kayu, pihak perusahaan memasang rel utama sepanjang 10 km dan menggunakan gerbong serta lokomotif diesel (Gambar 4).

ting off the "ramin" wood. However, witnesses of the villagers said that this company also hew down other types of wood .

During this period most of the villagers of Jabiren become forest loggers as their main livelihood of. It is reasonable because the product woods is marketable. Logging concession boundaries is the radius of 5 km from the riverside of Kahayan river, while for companies, it was out of this range. To convey timber harvest, the company installed rails including carriages and locomotives operated by diesel. The length of main rail is more than 10 km, and it has both left and right branch (Figure 4).

Harvested timber products carried out by companies reach thousands of



Gambar 4. Nampak Hermanus Tuwe (72th) memegang potongan besi rel bekas milik PT Jayanti Jaya (23 Maret 2013).

Figure 4. A villager, Hermanus Tuwe (72 years old) was holding a piece of iron rails belonged to PT. Jayanti Jaya.

Gambar 5. Berson (46th) berdiri di bekas parit (garis merah) tempat masyarakat keluarkan kayu di tahun 1975-an, kedalaman air saat itu setinggi pinggang (26 Maret 2013).

Figure 5. Berson (46 year old) standing in the former trench (the red lines) where villagers take out the wood in the 1975's, the water level reach waist at that time.

Kayu yang ditebang perusahaan tiap bulan mencapai ribuan pohon, dan rata-rata satu potong kayu ukuran panjang 4 m setara 0,5 m^3, sedangkan 1 pohon setara 2,5 m^3.

Masyarakat Desa Jabiren saat itu juga menebang kayu di wilayahnya sendiri. Jumlah regu penebang kayu umumnya terdiri hingga 4 orang, dan diperkirakan ada 40 regu, hasil tebangan kayu dijual ke pengumpul. Rata-rata setiap regu pada tahun 1972 – 1980 dapat mengumpulkan 60-70 m^3 kayu per bulan, sedangkan pada tahun 1980-1995 hasilnya menurun hanya mencapai 40 m^3 per bulan dari setiap regu (Gambar 5). Maraknya penebangan hutan saat itu dipicu rendahnya harga karet yang menjadi sumber penghasilan sebelumnya.

Kondisi ekosistem Desa Jabiren 1972-1995 mulai terdegradasi, namun keragaman hayati relatif baik, tinggi muka air lahan rawa menurun hingga kurang dari 1 m, belum ada pembuatan saluran drainase, dan belum dijumpai kebakaran hutan dan lahan.

Periode 1995-2012: Kehilangan Air Berlebihan dan Kebakaran

Dimulainya Proyek Pengembangan Lahan Gambut Sejuta Hektar tahun 1995, ditandai

trees every month and for a piece of wood with length of 4 meters, it was equivalent to 0.5 m^3 while for a tree, it is equivalent to 2.5 m^3.

At that time, most of villagers of Jabiren also cut timber on its own territory. Number of woodcutter team generally consists of up to 4 people, and it is estimated that there are 40 teams or groups, the product of harvested timber is sold to collectors. In 1972 – 1980, on average, each group may collect 60-70 m^3 per month, whereas in 1980-1995, the results become decrease only 40 m^3 per month for each group (Figure 5). Rampant deforestation at this time was triggered by the low price of rubber that is considered as the source of previous income.

In 1972 to 1995, the ecosystem around Jabiren become degraded, but it relatively still has good biodiversity, water level decreased to less than 1 m, there is no drainage canals. In addition, land and forest fires has not been found.

Period 1995-2012: Excessive Water Loss and Fire

The massive drainage channels were then built since mega rice or peat land development project has been started in 1995. These canals cause Jabiren areas began to dry up. In 2002,

dengan pembuatan kanal atau saluran drainase berukuran raksasa. Kanal-kanal tersebut menyebabkan kawasan Desa Jabiren yang dulunya rawa-rawa mulai mengering. Tahun 2002 masyarakat membuat Handil Panenga secara manual sepanjang 1 km, tahun 2003 diperpanjang lagi 2 km menggunakan excavator, dan tahun 2005 diperpanjang lagi sejauh 3 km serta dibuat rei-rei. Hal ini merupakan upaya masyarakat Desa Jabiren memanfatkan kawasan yang terdegradasi tersebut menjadi kebun karet. Pada tahun 2006 tanaman karet mulai ditanam besar-besaran di kawasan tersebut.

Pembuatan saluran drainase intensif menyebabkan kawasan kubah gambut mengering hingga lebih dari 1 m akibat kehilangan air yang berlebihan. Keringnya tanah gambut

people tried to make Handil Panenga manually with the length of 1 km and it was extended become 2 km using excavator equipment, in 2003. By the end of 2005, after extension of the channel as far as 5 km, several "rei's" were then developed. This is an effort conducted by villagers of Jabiren in order to take advantage of the degraded land areas become rubber plantation. In 2006, rubber trees began to be planted wide-scale in this area.

The making of intensively drainage channels caused peat dome areas become dries up, the water level decreased more than 1 m due to excessive water loss. This condition of dry peat trigger land fires during the dry

Gambar 6. Pohon Tumih (*Combretocarpus rotundatus* (Nig) Denser) roboh karena terbakar, bertunas kembali namun terbakar lagi pada kebakaran September 2012 (30 Januari 2013).

Figure 6. The Tumih tree (*Combretocarpus rotundatus* (Nig) Denser) collapsed due to fire, tumih trees grow shoots, but shoots also burned in 2012. (30th January 2013)

Gambar 7. Kebun karet umur 5 tahun hangus terbakar pada September 2012 (30 Januari 2013).

Figure 7. 5-year-old rubber plantation burned down in September 2012 (30th January 2013).

memicu terjadinya kebakaran di musim kemarau. Kebakaran besar pertama kali terjadi pada tahun 1997 atau 2 tahun setelah kanal raksasa dibuat. Kebakaran besar berikutnya terjadi pada tahun 2005, 2007, dan 2012 (Gambar 6-7).

Penyebab kebakaran umumnya diduga akibat kecerobohan oknum tertentu membersihkan lahan dikawasan gambut dengan membakar namun tanpa diawasi atau karena kecerobohan oknum yang membuang puntung rokok masih menyala pada kawasan lahan gambut yang kering di musim kemarau.

Periode 2013: REDD+, Pemberdayaan Masyarakat untuk Menuju Lahan Gambut Lestari

Akhir tahun 2012 dimulai penyusunan program pemberdayaan masyarakat dan pemulihan ekosistem di wilayah Handil Panenga di Desa Jabiren.

Kucuran dana hibah sebesar Rp. 795.000.000 dari Sekber REDD+ UNDP digunakan mendukung kegiatan di lokasi Handil Panenga, Desa Jabiren yang dilaksanakan oleh Balai Pengkajian Teknologi Pertanian Kalimantan Tengah.

season. The first large fires occurred in 1997 or 2 years after massive canals were made . The next conflagration occurred in the year of 2005, 2007, and 2012 (Figure 6-7).

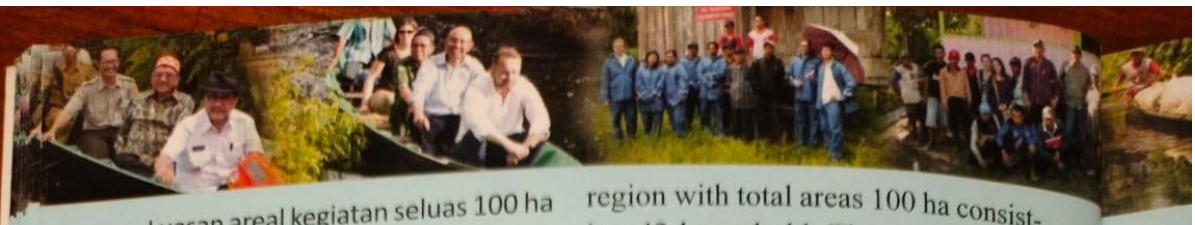
Fires generally occur due to carelessness of someone to clear the land at peat land region through burning technique without supervision or due to carelessness people who throw cigarette butts still lit in dry peatland areas during the dry season.

Period 2013: REDD+, Community Empowerment Towards for Sustainable Peatlands

By the end of 2012, community development programs and ecosystem restoration was started in areas of Handil Panenga, Jabiren.

Grant funding amounting to 795 million rupiahs from the Joint Secretariat of REDD+ UNDP is used to support any activities carried out by the Assessment Institute for Agricultural Technology of Central Kalimantan as the Technical Unit of the Agency for Agricultural Research and Development, Ministry of Agriculture located in Handil Panenga, Jabiren.

The activities were conducted at



Luasan areal kegiatan seluas 100 ha yang terdiri dari 42 kepala keluarga. Strategi yang diterapkan diutamakan memberdayakan masyarakat kemudian memperbaiki lingkungan. Pemberdayaan masyarakat dilakukan melalui sosialisai kegiatan, pelatihan budidaya karet dan olahan buah nanas, pembersihan semak belukar kebun karet, penanaman tanaman sela nanas sebanyak 100.000 rumpun, pemupukan dan pemberian amelioran pupuk kandang ayam. Setelah kegiatan tersebut dirasakan manfaatnya oleh masyarakat, maka strategi berikutnya adalah memperbaiki ekosistem, yaitu melalui karakterisasi dan pemetaan tanah, pengelolaan air melalui pembuatan pintu air sistem bertingkat di Handil Panenga, dan pengukuran karbon tersimpan dan emisi gas rumah kaca CO_2 (karbon dioksida) dan CH_4 (metan).✪

region with total areas 100 ha consisting 42 household. The main strategy that was applied include community empowerment followed by improving the environment.

Community empowerment was performed through socialization, training of rubber cultivation and processed pineapple fruit, cleaning rubber bushes, planting 100,000 pineapples as inter cropping, fertilizing and chicken manure ameliorant application. After these main activities provide positive impact to the community, then the next strategy is conducted to improve the ecosystem through characterization and mapping of soil, water management through the making of multilevel system of floodgates in Handil Panenga, and measurements of stored carbon and greenhouse gas emissions of CO_2 (carbon dioxide) and CH_4 (methane) .✪

BAB III
PUNTUNG ROKOK DAN KEBAKARAN KAWASAN GAMBUT

CHAPTER III
CIGARETTE BUTTS AND PEAT FIRE

Musim kemarau merupakan saat rawan terjadinya kebakaran di kawasan gambut. Hal ini disebabkan bahan organik berupa gambut, tunggul kayu, serasah, dan semak dalam kondisi kering, bahkan pada musim kemarau banyak oknum menebas semak belukar untuk membersihkan lahan.

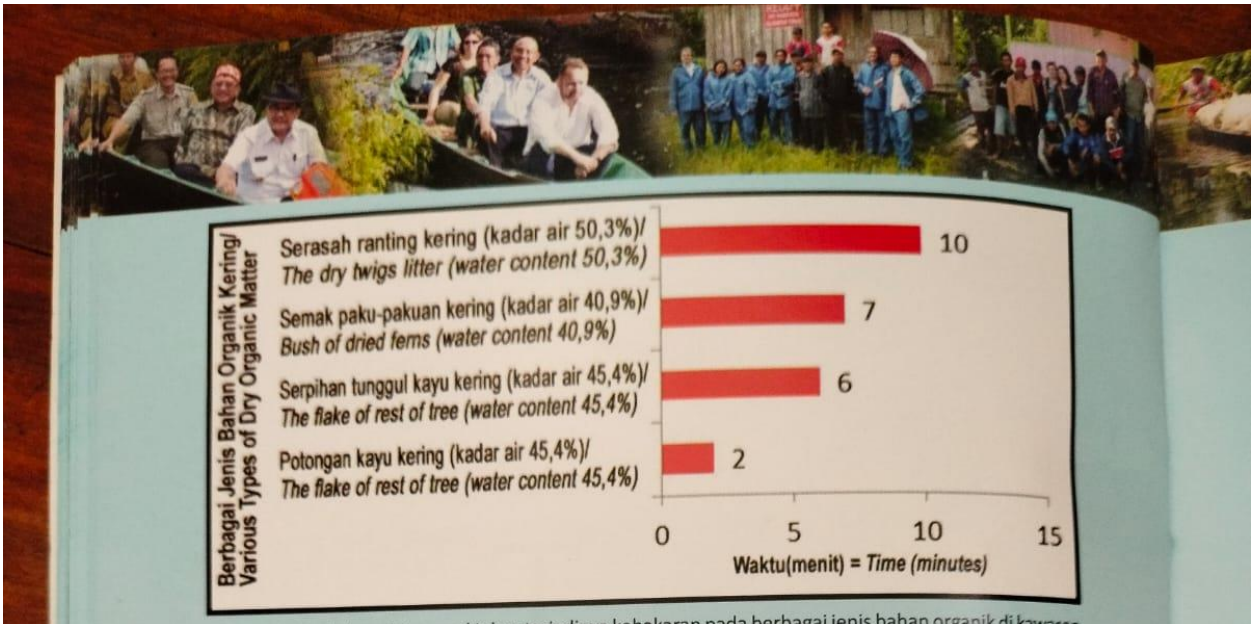
Perilaku masyarakat juga diduga mempengaruhi kejadian kebakaran, salah satu indikator adalah banyaknya oknum masyarakat perokok di kawasan gambut. Banyak isu menyebutkan bahwa putung rokok yang dibuang oleh oknum tertentu dapat menyebabkan kebakaran kawasan gambut, baik perbuatan itu disengaja atau tanpa disengaja.

Guna membuktikannya maka dilakukan penelitian tentang kebenaran isu tersebut. Firmansyah (2013) putung rokok menyala yang dibuang oknum menyebabkan meluasnya kebakaran di kawasan gambut pada musim kemarau. Keyakinan meluasnya kebakaran pada

The dry season is considered as prone period to fires in peat land areas. This is due to organic materials such as peat, wood stumps, litter, and shrubs in dry conditions, even in the dry season many persons cut scrub to clear land.

People's behavior may have influenced the incidence of fire, one of some indicators is that there are many smokers in peat land areas. Issues mentioned that many discarded cigarette butt were found and they can cause peat fires due to intentional or accidental.

In order to prove the truth of this issue, the study of peat land fire was then conducted. Firmansyah (2013) stated that discarded cigarette butt caused widespread fires in peat areas during the dry season. The widespread of fires in various types of se-



Gambar 8. Periode waktu meyakinkan terjadinya kebakaran pada berbagai jenis bahan organik di kawasan lahan gambut akibat puntung rokok menyala di musim kemarau 23 Oktober 2013.

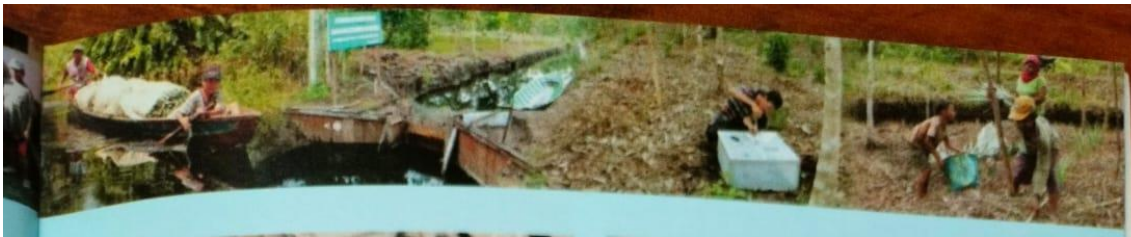
Figure 8. Period of time convincing fires in various types of organic matter in peat land areas caused by lit cigarette butts during the dry season October 23th, 2013.

berbagai jenis bahan organik terpilih tersebut berkisar 2 – 10 menit (Gambar 8 - 13).

Penelitian yang dilakukan di lokasi REDD+ handil Panenga Jabiren pada penghujung musim kemarau yang tidak hujan lebih dari 30 hari berturut-turut pada 23 Oktober 2013 tersebut dapat memberikan gambaran, bahwa masyarakat yang memasuki kawasan gambut di musim kemarau, baik itu petani, pemancing, dan pemburu haruslah berhati-hati saat melakukan aktivitas sambil merokok.✪

lected organic materials was ranged 2-10 min (Figure 8 - 13).

The study was conducted at location of REDD+ of Handil Panenga, Jabiren in the end of the dry season without rainy days more than 30 days consecutively on October 23th, 2013. This condition may give an idea, that people involving farmers, hunters who entered the peat land areas during the dry season must be careful when doing activities while smoking.✪



Gambar 9. Serasah daun karet kering (kadar air 63,7%) tidak terbakar hingga putung rokok yang menyala padam.

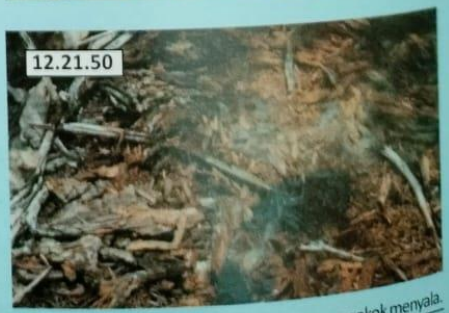
Figure 9. Rubber leaf litter (water content 63,7%) not burned until extinguished lit cigarette butt.

Gambar 10. Serasah ranting kering (kadar air 50,3%) mulai terbakar pada 10 menit setelah terkena puntung rokok menyala.

Figure 10. The dry twigs litter (water content 50,3%) began to burn after 10 minutes due to lit cigarette butts.

Gambar 11. Semak paku-pakuan kering (kadar air 40,9%) mulai terbakar pada 7 menit setelah terkena putung rokok menyala.

Figure 11. Bush of dried ferns (water content 40,9%) begin to burn 7 minutes due to a lit cigarette butts.



Gambar 12. Serpihan tunggul kayu kering (kadar air 45,4%) meyakinkan terbakar setelah 6 menit terkena putung rokok menyala.

Figure 12. The flake of rest of tree (water content 45,4%) start to burn 6 minute due to a lit cigarette butts.

Gambar 13. Potongan kayu kering (kadar air 45,4%) mulai terbakar pada 2 menit setelah terkena putung rokok menyala.

Figure 13. The flake of rest of tree (water content 45,4%) start to burn 2 minute due to a lit cigarette butts.

BAB IV
KEGIATAN PEMBERDAYAAN MASYARAKAT

CHAPTER IV
COMMUNITY EMPOWERMENT ACTIVITY

Partisipasi masyarakat terhadap sesuatu kegiatan terutama yang terkait dengan pengelolaan lingkungan sangat penting. Hal ini disebabkan karena mayarakatlah yang secara langsung berhubungan dengan eksploitasi lingkungan tersebut. Beberapa kegiatan rehabilitasi lingkungan yang terlalu menekankan upaya-upaya perbaikan lingkungan tanpa melibatkan masyarakat banyak mengalami kegagalan.

Kegiatan pemberdayaan masyarakat merupakan kegiatan pertama yang dilakukan. Hal ini merupakan strategi utama, agar perbaikan lingkungan dipahami dan didukung oleh masyarakat. Tiga komponen dalam memperbaiki lingkungan agar tidak lagi terulang kejadian kebakaran dan sekaligus menurunkan emisi gas rumah kaca, yaitu: pengelolaan tata air, pemberian amelioran pupuk kandang ayam, dan penanaman nanas disela tanaman karet.

Kegiatan pertama dalam pemberdayaan masyarakat adalah

Community participation to the certain activities primarily related to environmental management is very important. The community has directly and closely related to the exploitation of environment. Some environmental rehabilitations that only focus on environmental improvement efforts without involving community will be failure.

Community empowerment is main activity that should be carried out first. It can be considered as the main strategy so that environment improvement can be understood and supported by community. Three components in improving the environment, overcoming land fires and reducing greenhouse gas emissions, include: management of the water system, application of ameliorant chicken manure, and planting pineapple as intercropping for rubber plantation.

First activity performed in relation to community development in the area of Handil Panenga was conducted by Farmers Group of Panenga involving socialization and requesting approval from villagers of

sosialisasi kegiatan sekaligus meminta persetujuan masyarakat Desa Jabiren. Hal ini penting sebagai usaha untuk mendapatkan dukungan semua pihak

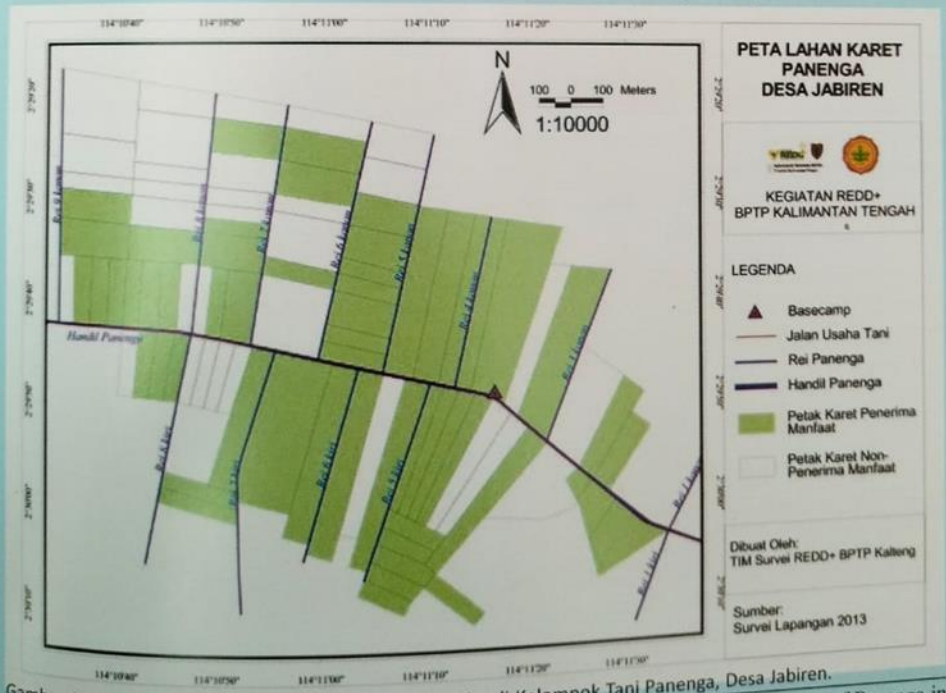
Jabiren. It is important as part of an effort to get support from all related parties (Figure 14). Rubber cultivation training as an innovative new

Gambar 14. Sosialisasi, kegiatan yang dilakukan pertama kali (1 Pebruari 2013).

Figure 14. Socialization, the first main activity (1st Februari 2013).

Gambar 15. Pelatihan untuk memperbaiki teknologi budidaya karet rakyat (6 April 2013).

Figure 15. Training of people's rubber technology improvement (6th April 2013).



Gambar 16. Peta kawasan kegiatan REDD+ seluas 100 ha di Kelompok Tani Panenga, Desa Jabiren.

Figure 16. Situation map for working areas of REDD+ covering 100 ha at Farmer's Group of Panenga in Jabiren.

(Gambar 14). Pelatihan budidaya karet sebagai inovasi teknologi baru memperbaiki teknologi karet rakyat yang umumnya memiliki produktivitas rendah dan juga olahan buah nanas (Gambar 15-16).

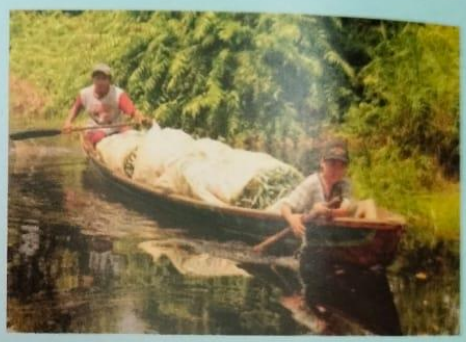
Pembersihan kebun karet, pemupukan dan penanaman tanaman sela bertujuan agar semak belukar di tanaman karet bukan sebagai bahan

technology to improve people's rubber technology that generally have low productivity, making tapping grooves, until they did not use rubber pest and disease control (Figure 15-17).

Rubber cleaning, fertilizing and planting alleycropping were introduced in order to reduce rubber bush

Gambar 17. Pembersihan semak belukar di kebun karet Pak Berson (26 Maret 2013).

Figure 17. Cleaning and weeding bush in rubber plantation areas (26th March 2013).



Gambar 18. Seorang anak laki-laki membantu bapaknya membawa bibit nanas (22 Mei 2013).

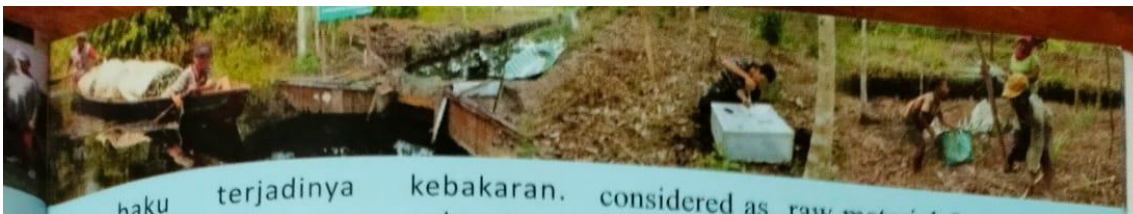
Figure 18. A boy helps his father bringing the seeds of pineapple (22th May 2013).

Gambar 19. Keluarga Pak Yusran sedang menanam nanas di sela karet (6 Mei 2013).

Figure 19. The family of Yusran were planting pineapple as intercrop of rubber (6th May 2013).

Gambar 20. Nanas telah tertanam di kebun karet Pak Berson (17 April 2013).

Figure 20. Introduction of pineapple as alleycropping (17th April 2013).

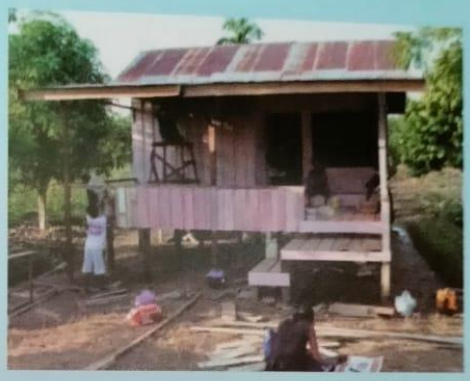


baku terjadinya kebakaran. Penanaman tanaman sela nanas memiliki tujuan antara lain: meningkatkan penghasilan petani dan salah satu cara agar petani lebih sering mengunjungi kebunnya yang berdampak pada upaya pencegahan

considered as raw material for fires. The introduction of pineapple as alleycropping has several objectives: increase farmers' incomes in addition to more frequently visiting the gardens that have an impact on the pre-

Gambar 21. Base Camp REDD+ kondisi awal saat kunjungan Tim UNDP (20 Maret 2013).

Figure 21. The initial condition of base camp of REDD+ (4th Maret 2013).

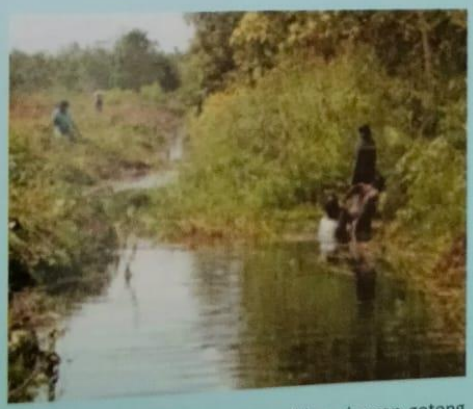


Gambar 22. Base Camp REDD+ direnovasi melalui gotong royong (13 April 2013).

Figure 22. Base Camp of REDD+ after renovation through community cooperation (13th April 2013).

Gambar 23. Handil penuh semak (30 Januari 2013).

Figure 23. Channel stream filled with shrubs and bushes (30th January 2013).



Gambar 24. Handil mulai dibersihkan dengan gotong royong (14 April 2013).

Figure 24. Cleaning the channel through community cooperation (14th April 2013).

kebakaran (Gambar 17-20).

Gotong royong oleh masyarakat di Handil Panenga mulai aktif kembali. Beberapa kegiatan gotong royong yang dialkukan antara lain renovasi Base Camp REDD+, pembersihan handil dari semak, pembersihan jalan usahatani dari semak belukar, pembuatan darmaga tambat perahu (Gambar 21-25) .✪

vention of fire (Figure 17-20).

The teamwork performed by local community begin to develop in Handil Panenga. Some activities that have been conducted involve renovation of Base Camp for REDD +, cleaning the channel from shrubs, cleaning the from shrubs, making boat dock (Figure 21-25).✪

Gambar 25. Jalan usahatani dan handil telah bersih dari semak setelah dilakukani gotong royong oleh masyarakat (4 Mei 2013).

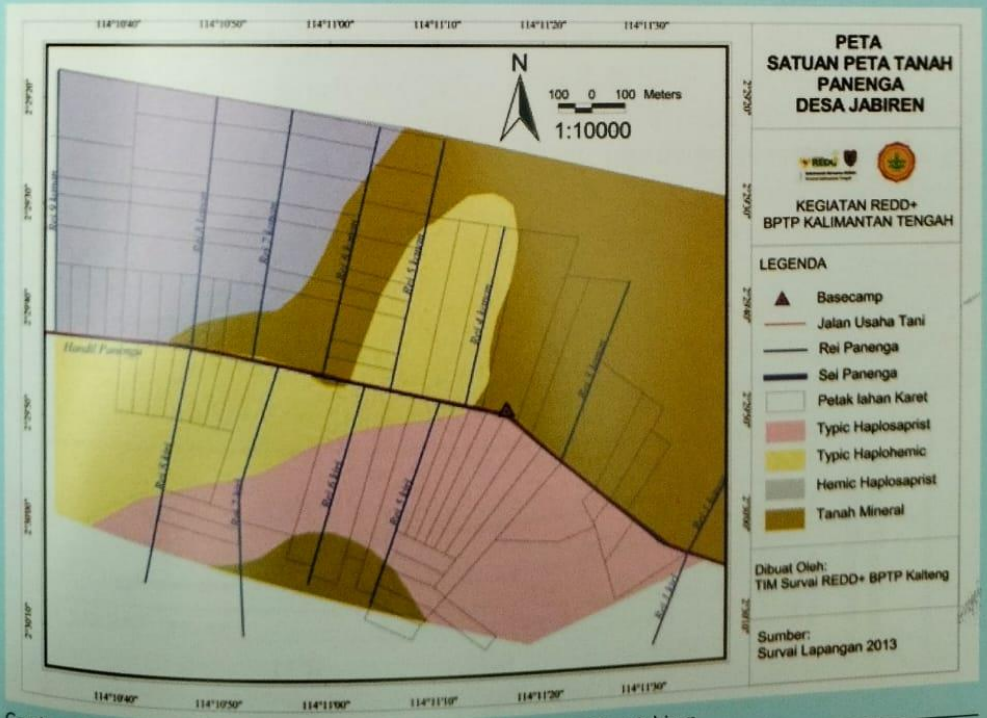
Figure 25. Farm roads and main channel after cleaning process through community cooperation (4th May 2013).

BAB V
KEGIATAN MEMBANGUN LAHAN GAMBUT LESTARI

CHAPTER V
DEVELOPING SUSTAINABLE PEATLANDS

Air adalah kunci dalam pengelolaan lahan gambut, karena air memegang peranan penting dalam berbagai hal, antara lain: suplai untuk kebutuhan tanaman, berpengaruh terhadap proses dekomposisi gambut dan subsidensi, berpengaruh terhadap emisi gas rumah kaca, hingga berpengaruh terhadap kondisi bahaya kebakaran.

Water is the key for management of peat lands because it plays an important role in a variety of ways, such as: supply for crop needs, its influence to process of peat decomposition and subsidence, effect on greenhouse gas emissions, and also fire hazard conditions.



Gambar 26. Peta tanah lokasi kegiatan REDD+ di Handil Panenga, Desa Jabiren.

Figure 26. The map of soil for REDD+ areas in Handil Panenga, Jabiren.

Pemetaan Tanah dan C Tersimpan

Jenis tanah yang ditemukan di lokasi kegiatan terdiri dari tanah gambut (169,36 ha) dan tanah mineral (115,52 ha). Tanah gambut terdiri dari Typic Haplosaprist luas 57,81 ha, kedalaman 459,1 cm, C tersimpan 146.238,66 t; Typic Haplohemist luas 54,56 ha, kedalaman 558,0 cm, C tersimpan 168.479,64 t; dan Hemic Haplosaprist luas 56,99 ha, kedalaman 130 cm, C tersimpan 40.714,79 t (Gambar 26).

Pemasangan Rambu Ukur dan Piezometer

Rambu ukur dipasang di lokasi handil Panenga sebanyak 3 buah, mewakili bagian hulu (RU3) di Rei 8, tengah (RU2) di Rei 3 dan hilir (RU1) di Rei 1. Rambu ukur berfungsi untuk mendeteksi ketersediaan air di kawasan kubah gambut mulai Rei 9 hingga Rei 18 (Gambar 27-29).

Apabila ketinggian air dilihat dari rambu ukur tinggi seperti di musim hujan, maka air yang terdrainase melalui handil

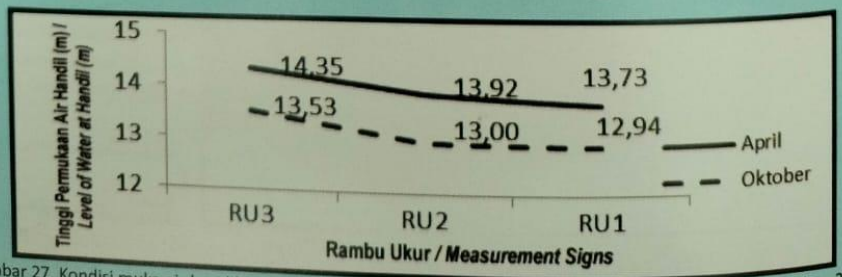
Soil Mapping and C Stock

The type of soil found at the site consists of peat soil (169.36 ha) and mineral soil (115.52 ha). For peat soil, it involves Typic Haplosaprist wide 57.81 ha, depth of 459.1 cm, C stock 146.238,66 t; Typic Haplohemist 54.56 ha wide, 558.0 cm depth, C stock 168,479.64 t; and Hemic Haplosaprist wide 56.99 ha, depth 130 cm, C stock 40,714.79 t (Figure 26).

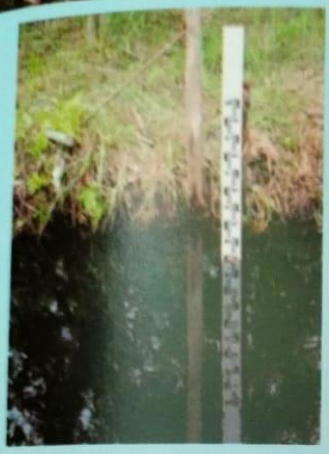
Instalation of Measuring Instrument and Piezometer

There are 3 measuring instruments operated in channel of Panenga; upstream part (RU3) at Rei 8, middle part (RU2) at Rei 3 and downstream part (RU1) at Rei 1. This kind of equipment was operated to detect water availability in peat dome areas at Rei 9 to Rei 18 (Figure 27-29).

If water level show the highest level based on measurement of measuring instruments, it indicates that water drainaged through channel is



Gambar 27. Kondisi muka air handil Panenga pada April (Musim Hujan) dan Oktober (Musim Kemarau) tahun 2013.
Figure 27. Water level condition of channel for handil Panenga on April (Rain Season) and October (Dry Season) in 2013.

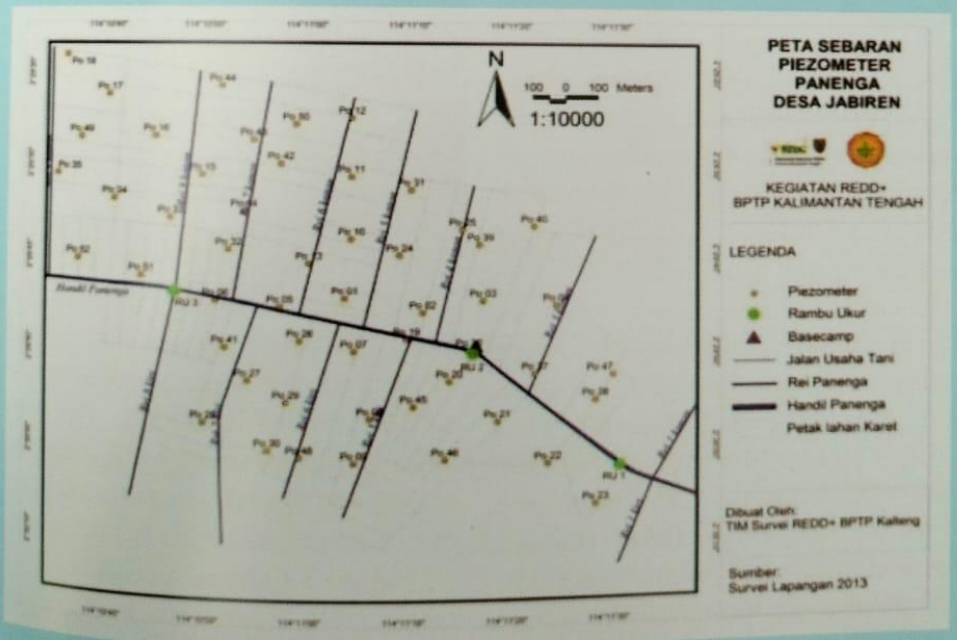


Gambar 28. Kondisi ketinggian permukaan air handil pada musim hujan 14,00 m (14 April 2013).

Figure 28. The condition of water level for channel (Handil) at rain season, 14,00 m (14th April 2013).

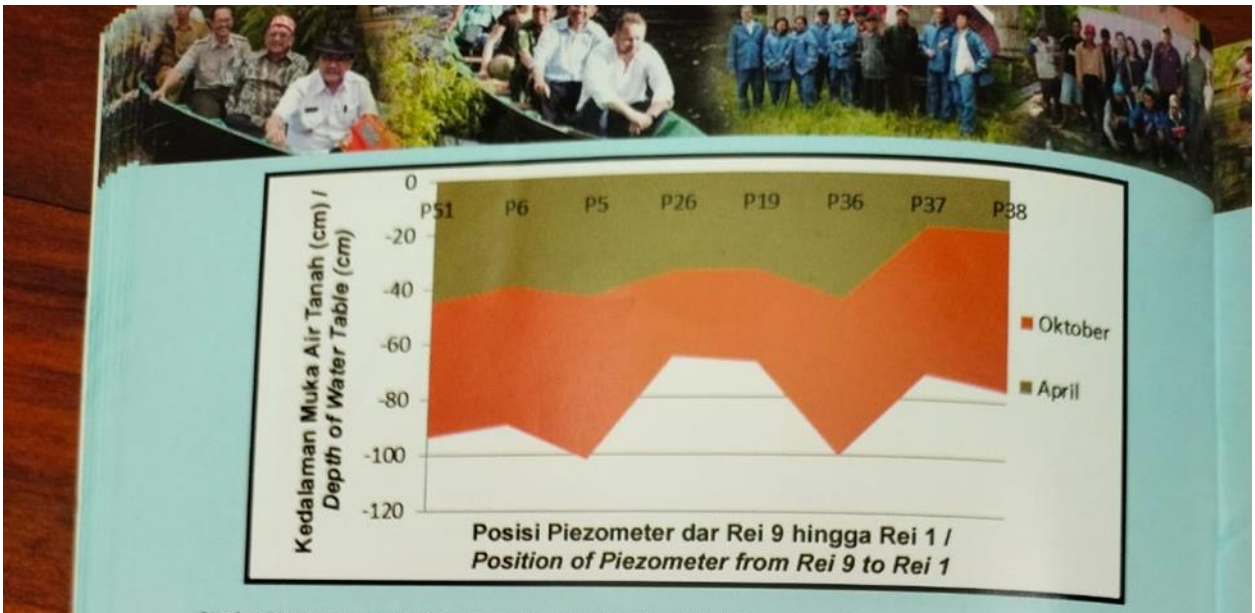
Gambar 29. Kondisi ketinggian permukaan air handil pada musim kemarau 13,01 m (23 Oktober 2013).

Figure 29. The condition of water level for channel (Handil) at dry season, 13,01 m (23th October 2013).



Gambar 30. Peta penempatan piezometer dan rambu ukur di lokasi kegiatan REDD+ di Handil Panenga, Desa Jabiren.

Figure 30. The map of distribution for installation of Piezometer and measuring instrument at REDD+ areas in Handil Panenga, Jabiren.



Gambar 31. Kondisi muka air tanah sejajar handil dari hulu ke hilir pada April (Musim Hujan) dan Oktober (Musim Kemarau) tahun 2013.

Figure 31. The condition of water table parallel to channel from upstream to downstream in April (Rain Season) and October (Dry Season) in 2013.

umumnya didominasi air berlebihan yang berasal dari air hujan yang jatuh di kawasan kubah gambut. Sebaliknya jika air di handil mulai surut ekstrim, artinya air yang terdrainase di handil adalah air yang tersimpan di kubah gambut dan hal itu menyebabkan kubah gambut mengering dan bahaya kebakaran akan meningkat.

Piezometer digunakan untuk mengetahui muka air tanah. Sebanyak 50 piezometer telah dipasang pada luasan 100 ha (Gambar 30). Kondisi muka air tanah di musim hujan dan musim kemarau cukup banyak perbedaan ketinggiannya (Gambar 31).

Gambar 31 menunjukkan bahwa penurunan permukaan air tanah cenderung lebih banyak pada posisi mendekati kubah gambut di Rei 9

generally dominated by excessive water that comes from rain water that falls in the peat dome. On the other hand, if the water receded drastically, the drainaged water in channel is water that is available at peat dome so that this areas become to dry and it has highly risk to fire.

Piezometer was employed to know water table level. There are 50 units of piezometer that were installed in the area of 100 ha (Figure 30). The condition of water table level at both rain season and dry season has quite a lot of difference in height (Figure 31).

Figure 31 show that decrease in water table level tends to be much closer to the position of the peat dome in Rei 9 comparing with downstream in Rei 1. This shows that the loss of

dibandingkan dengan di hilir di Rei 1. Hal tersebut menunjukkan bahwa kehilangan air dari kubah gambut terjadi relatif besar yang terdrainase di saluran drainase atau handil.

Membangun Pintu Air

Kegiatan penting lainnya adalah memperbaiki aspek hidrologi, yaitu mengkonservasi air yang keluar dari kubah gambut dengan membuat pintu air di handil. Pintu air yang dibuat dengan sistem bertingkat, yaitu dibangun pintu air sebanyak 4 buah dari

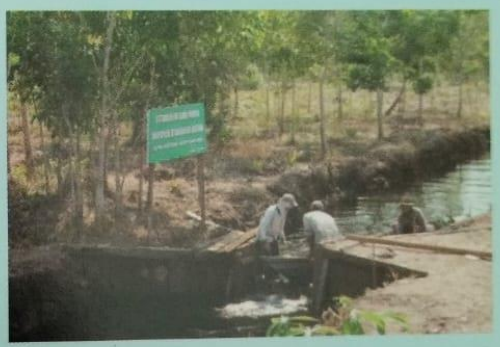
water from the peat dome was relatively large in the channel pr "handil" that is drainaged.

Building Floodgate

Community participation to the certain activities primarily related to environmental management is very important. The community has directly and closely related to the exploitation of environment. Some environmental rehabilitations that only focus on environmental improvement efforts without involving community

Gambar 32. Pintu air di handil menahan air dari kubah gambut (19 September 2013).

Figure 32. Floodgates in channel (Handil) can hold water from the peat dome (19th September 2013).



Gambar 33. Siapa yang membuka pintu air, maka ia harus menutup kembali (26 September 2013).

Figure 33. Anyone who open the floodgate, he has to close it again (26th September 2013).

hilir hingga hulu handil (Rei 3, Rei 12, Rei 14, Rei 16) oleh masyarakat sendiri.

Arus air dari hulu ke hilir handil cukup kencang karena terdapat perbedaan ketinggian muka air handil mencapai 0,7 m. Sosialisasi pembuatan pintu air untuk mencegah lahan gambut

will be failure.

Another important activity is to improve aspects of hydrology, so that which conserve water coming out of the peat dome by create floodgate that is constructed with that is constructed with in channel. Water flow from upstream to downstream was fast enough

mengering. Pengaturan buka dan tutup pintu air ditetapkan sendiri oleh masyarakat. Terdapat ketentuan adat, siapa yang membuka pintu air maka ia juga yang menutupnya. Pintu air akan dibuka penuh saat musim hujan (Gambar 32-33).

Pengukuran Emisi Gas Rumah Kaca

Pengukuran emisi gas rumah kaca dilakukan selama 4 kali dengan perlakuan karet diberi pupuk kandang ayam, tanaman sela diberi pupuk kandang ayam, kebun karet terlantar, dan lahan semak-semak. Ternyata emisi CO_2 terendah diperoleh pada nanas diberi pupuk kandang ayam, begitu juga tanaman karet diberi pupuk kandang ayam, jika dibandingkan dengan karet

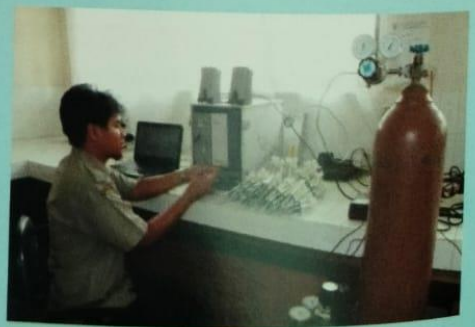
because there are differences water level up to 0.7 m. The socialization of making floodgates was conducting in order to prevent drying of peatlands. The management of water such as settings of floodgate was performed by the local community. There are customary provisions, who opened the floodgates so he has to close it again. The floodgates will be opened fully during the rainy season (Figure 32-33).

The Measurement of Greenhouse Gas Emissions

The measurement of greenhouse gas emissions is conducted for 4 times with several treatments such as chicken manure application for rubber, fertilizing alley cropping with chicken manure, abandoned rubber plantation, and bush land. The result showed that the lowest CO_2 emissions was obtained from pineapple cultivation with chicken manure,

Gambar 34 Pengambilan gas rumah kaca di lapangan (30 Agustus 2013).

Figure 34. The taking of greenhouse gas in the field (30st Agustus 2013).



Gambar 35. Pengukuran gas rumah kaca di laboratorium (1 September 2013).

Figure 35. Greenhouse gas measurements in the laboratory (1st September 2013).

Tabel 1. Emisi Gas Rumah Kaca pada Berbagai Kondisi Pengukuran di REDD+ Desa Jabiren

Table 1. Greenhouse Gas Emissions at Various Measurement Conditions in REDD+ Jabiren

Kondisi Pengukuran Measurement Condition	CO_2 (t/ha/th) (t/ha/year)	CH_4 (t/ha/th) (t/ha/year)
Kebun karet + pupuk kandang ayam Rubber plantation + chicken manure	48,86	0,0015
Nanas + pupuk kandang ayam Pineapple + chicken manure	45,57	-0,0021
Kebun karet bersemak Rubber plantation with bushes	63,95	0,0017
Lahan semak Bushes	97,25	0,0030

terlantar dan lahan semak. Kecenderungan yang sama juga diperoleh dari emisi CH_4 (Tabel 1, Gambar 34-35).

Pemasangan Tonggak Penanda Subsiden

Penurunan permukaan tanah gambut terjadi akibat adanya beberapa hal antara lain: terjadinya kebakaran, meningkatnya dekomposisi gambut, terjadinya tekanan secara langsung diatas permukaan tanah gambut, kehilangan air tanah, hingga emisi gas rumah kaca. Guna melihat kecepatan penurunan permukaan tanah gambut, maka dipasang tonggak penanda subsiden permukaan tanah gambut. Tonggak penanda subsiden tanah gambut dipasang pada areal dengani kedalaman

as well as rubber plants with chicken manure comparing with abandoned rubber plantation, and bush. The same trend was also obtained from the emission of CH_4 (Table 1, Figure 34-35).

Instalation of Pole For Subsidence Marker

Peat soil subsidence occurs due to several reasons, among others: occurrence of fire, increasing peat decomposition, pressure directly on the surface of peat soil, groundwater loss, and also greenhouse gas emissions. To know the rate of speed for the decrease of peat soil surface, then the marker of peat surface subsidence was installed. Stake marker for peat soil subsidence was installed at the depth of 160 cm in rubber

Gambar 36. Tonggak penanda subsidensi dipasang pada lokasi dengan tebal gambut 160 cm (11 Juni 2013).

Figure 36. Stake for subsidence marker installed at peat depth 160 cm (11th June 2013).

Gambar 37. Setelah 4 bulan tonggak terpasang, belum ada tanda-tanda penurunan permukaan tanah gambut (21 Oktober 2013).

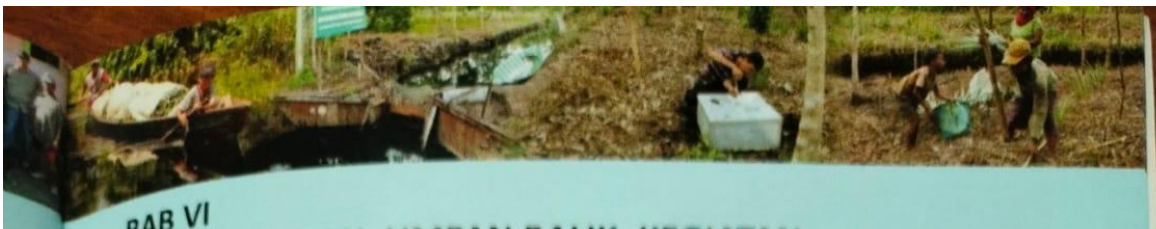
Figure 37. After 4 months stake installation, there is no indication of subsidence (21th October 2013).

gambut 160 cm pada kebun karet berumur kurang lebih 6 tahun, dengan jarak kurang lebih 25 m dari saluran handil (Gambar 36-37).

Kondisi penurunan permukaan gambut selama 4 bulan belum terjadi di lokasi REDD+ Handil Panenga. Hal ini berbeda dengan lokasi ICCTF di Sei Jabiren atau 2 km dari lokasi. Penurunan gambut di lokasi Demplot ICCTF yang ditanami karet umur 6 tahun selama 4 bulan (Juli - Oktober 2012) pada jarak 25 m dari Sei Jabiren mencapai 7 cm (Firmansyah dan Mokhtar, 2012).✪

plantation areas at the age of plant about 6 years old, with a distance of approximately 25 m from the channel of "Handil" (Figure 36-37).

The decrease of peat surface for 4 months has not occurred at the site location of REDD + in Handil Panenga. This condition is different from the location of ICCTF in Sei Jabiren or 2 km from the site location. The decrease of peat surface at demonstration plots of ICCTF that were planted with rubber 6 years old for 4 months (July-October 2012) at a distance of 25 m from Sei Jabiren reaching 7 cm (Firmansyah and Mokhtar, 2012).✪



BAB VI
DISEMINASI DAN UMPAN BALIK KEGIATAN

CHAPTER VI
DISSEMINATION AND FEEDBACK ACTIVITIES

Aspek diseminasi merupakan kegiatan penting, sebab dapat menginformasikan banyak hal menyangkut kemajuan kegiatan dan juga sekaligus penyebaran inovasi baru kepada masyarakat luas. Berbagai media yang dipilih yaitu siaran televisi dan surat

Aspect of dissemination is an important activity, be cause it can inform a lot of things regarding the progress of activities and also dissemination of new innovations to the community. Various selected media include broadcast television and newspapers,

REDD+ BPTP KALIMANTAN TENGAH

ISEN MULANG

Mesin Perahu Ngadat, Teras Tetap Semangat Tinjau Kebun Percontohan

Gambar 38. Koran merupakan sarana diseminasi luas (4 September 2013).

Figure 38. Newspaper as means of dissemination (4th September 2013).

Gambar 39. Diseminasi melalui televisi sangat efektif (6 April 2013).

Figure 39. The effectiveness of dissemination through broadcast television (6th April 2013).

Gambar 40. Kunjungan UKP4 dan mahasiswa UK (10 Juni 2013).

Figure 40. Visit of UKP4 and student of UK (10th June 2013).

Gambar 41. Kunjungan Petani ASEAN-KLH (19 Juni 2013).

Figure 41. Visit of Farmer of ASEAN-KLH (19th June 2013).

Gambar 42. Kunjungan Kapus P3K2 Amerika-Eropa, Kemlu (30 Juli 2013).

Figure 42. Visit of Head of P3K2 Amerika- Eropa, Ministry of Foreign (30th Jully 2013).

Gambar 43. Kunjungan Donor ICCTF-Mitra Media (26 September 2013).

Figure 43. Visit of Donor for ICCTF-Mitra Media (26th September 2013).

kabar, selain menerima banyak kunjungan tamu-tamu dari nasional dan internasional (Gambar 38-44).

Respon positif dari Bapak Gubernur Kalimantan Tengah dibuktikan dengan diberinya bantuan ternak sapi untuk kelompok tani

in addition to receiving many guests visit from national and international (Figure 38-44).

Positive response from the Governor of Central Kalimantan proved with contribution of cattle to farmer groups of Panenga during

Gambar 44. Kunjungan Gubernur Kalimantan Tengah dan Deputi I UKP4 merupakan diseminasi yang efektif dan penting (3 September 2013).

Figure 44. Visits of Governor of Central Kalimantan and Deputy I UKP4, an effective dissemination and special important event (3th September 2013).

Panenga pada tahun anggaran 2014, melalui Dinas Pertanian dan Peternakan Provisi Kalimantan Tengah. Selain itu tercatat kegiatan dari beberapa instusi mulai bergerak merehabilitasi lahan gambut terdegradasi, yaitu dari Badan Pengelola Daerah Aliran Sungai Kahayan, FAO, hingga Kementerian Lingkungan Hidup.

Umpan balik dilakukan setelah seluruh rangkaian kegiatan yang dilakukan setelah seluruh tahapan kegiatan selesai dilakukan. Tujuan

fiscal year 2014, through the Department of Agriculture and Livestock, Central Kalimantan. In addition, there are several institutions that started to rehabilitate degraded peatlands, such as The Agency of Watershed Management for Kahayan, FAO, and the Ministry of Environment.

The feedback was performed after a whole series of main activities were carried out. The purpose of feedback itself is to obtain response

Gambar 45. Presentasi hasil REDD+ BPTP Kalimantan Tengah pada saat pembukaan Pusat Sarana Komunikasi Iklim di Buntoi, Kabupaten Pulang Pisau, Kalimantan Tengah (3 September 2013).

Figure 45. Result presentation of REDD+ AIAT of Central Kalimantan at the opening ceremony for Center of Communication for Climate in Buntoi, Pulang Pisau district, Central Kalimantan (3th September 2013).

Gambar 46. Seminar hasil di BPTP Kalimantan Tengah (13 September 20).

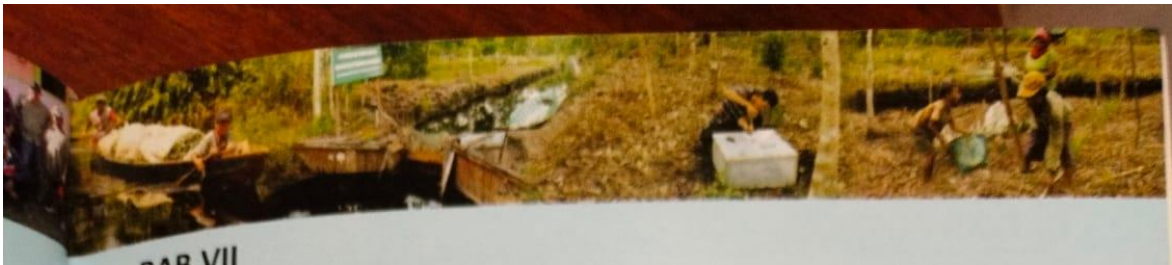
Figure 46. Seminar of results at AIAT of Central Kalimantan (13th September 20).

Gambar 47. Umpan balik di Desa Jabiren (15 September 2013).

Figure 47. The implementation of feedback in Jabiren (15th September 2013).

diadakannya umpan balik adalah untuk mendapatkan tanggapan masyarakat nasional dan internasional dari berbagai kalangan baik akademisi, pemerintahan, lembaga swadaya masyarakat dan petani terhadap kegiatan yang telah dilakukan. Manfaat dari diadakannya umpan balik adalah untuk mengevaluasi tingkat manfaat yang telah dirasakan oleh masyarakat dan juga mendiseminasikan hasil-hasil kegiatan yang telah dilakukan mulai Januari 2013 – September 2013 (Gambar 45-47).✪

of both national and international community, from various groups, academia, government, non-governmental organizations and farmers about this kind of activities that have been carried out. Benefits and outcome of feedback is to evaluate the level of benefits that have been perceived by the public and also disseminate the results of activities that have been conducted from January 2013 to September 2013 (Figure 45-47).✪



BAB VII
KESIMPULAN

1. Keberhasilan kegiatan terkait rehabilitasi kawasan lahan gambut akan tercapai jika didukung oleh masyarakat setempat. Pemberdayaan masyarakat merupakan kunci utama untuk kegiatan rehabilitasi kawasan gambut yang berpotensi dan telah mengalami degradasi.
2. Pemanfaatan tanaman sela nanas merupakan upaya meningkatkan aktivitas petani memelihara kebun karet, sehingga selain meningkatkan gizi masyarakat juga sekaligus meningkatkan pendapatan keluarga, dan secara tidak langsung menjaga kebun karet dari bahaya kebakaran lahan.
3. Pengelolaan air melalui pembuatan pintu air di saluran drainase utama (Handil) mampu mengkonservasi air yang merembes dari kubah gambut di saat musim kemarau.
4. Pemanfaatan kebun karet dan tanaman sela yang diberi pupuk kandang ayam lebih ramah lingkungan, karena lebih rendah emisi gas rumah kaca dibandingkan semak belukar.✪

CHAPTER VII
CONCLUSION

1. The success of any activities related to rehabilitation of peat land areas will be achieved if it is supported by the local community. Community empowerment is the key for rehabilitation of potential peat lands and degraded land as well.
2. The utilization of pineapple as intercrop is an effort to improve the farmer activity in order to maintain rubber plantation, so that in addition to improving nutrition, it can also increase family incomes, while at the same time, it will indirectly keep rubber plantation areas from fire hazards.
3. Water management through development of floodgates at main drainage channel (Handil) able to conserve water seeping from peat dome during the dry season.
4. Utilization of rubber and intercrops with application of chicken manure is environmentally technology, due to lower greenhouse gas emissions rather than bushes or shrubs.✪

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PENGELOLAAN LAHAN GAMBUT TERDEGRADASI MELALUI INOVASI TEKNOLOGI DAN PEMBERDAYAAN MASYARAKAT

The Management of Degraded Peatlands Throught Technology Innovation and Community Empowerment

"Buku ***Pengelolaan Lahan Gambut Terdegradasi Melalui Inovasi Teknologi dan Pemberdayaan Masyarakat*** berbasis karet rakyat dan tanaman sela dilakukan dengan pendekatan pemberdayaan masyarakat ini diharapkan memberikan gambaran dan bermanfaat bagi pembaca. Saya menyampaikan apresiasi kepada Tim Penyusun buku ini semoga tetap selalu berkarya, berbagi pengalaman dan informasi."

"Book ***The Management of Degraded Peatlands Throught Technology Innovation and Community Empowerment*** on the basis of smallholder rubber plantation and intercrops performed with community empowerment approach is released in order to provide an overview and benefit to the reader. I express highly appreciation to Redactor Team for this book, may remain always work, share the experiences and information."

Dr. Ir. Haryono, M.Sc.

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