

RSPO NEW PLANTING PROCEDURE



IOI GROUP

SUMMARY OF ASSESSMENT, PLANNING AND MANAGEMENT PLAN

PT. KALIMANTAN PRIMA AGRO MANDIRI
Ketapang District, West Kalimantan Province,
Indonesia.

April 12, 2018

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1. OVERVIEW AND BACKGROUND

PT. Kalimantan Prima Agro Mandiri (KPAM) is planning to develop an oil palm plantation to fulfill their demand in producing palm oil by-products. The location of the proposed plantation is in Ketapang District, West Kalimantan Province. The surrounded area of PT KPAM is bordered with: (i) the development area of the Danau Buntar village, PT UAI palm oil plantation, the production forest (HP), and the development plan area of Manismata Subdistrict (KSCT) in the north; (ii) the riparian buffer of Jelai River, the production forest, and the moratorium peatland area in the south; (iii) the moratorium peatland area and PT BSS in the west; (iv) the riparian buffer of Jelai River, which is also the border between Kalimantan Barat and Kalimantan Tengah, in the east.

PT. KPAM is a subsidiary company of the IOI Group. The IOI Group is registered as an RSPO member since 17 May 2004 with the registry number 2-0002-04-000-00.

Table 1: Company background information

Name of Company	PT. Kalimantan Prima Agro Mandiri
Line of Business and Activity	Oil Palm Plantation and Mills
RSPO Membership	Registered as IOI Group member since 2004
Contact Person	Tan Kim Ha, Acting Head of Plantation
Office Address	Jl. Melawai Raya No.10, Kebayoran Baru, Jakarta Selatan 12160.

PT. KPAM plans to develop an oil palm plantation at their location permit with a total area of 11,000 Hectares (1507/DPMPSTSP-D/2017). PT. KPAM has obtained the same permit for the area since August 2007, which was issued by Regent Ketapang (SK No. 365/2007, 20,000ha). A certified letter by Regent Ketapang (Surat Keterangan No: 100/1193/PEM) was issued on June 26, 2015.

Based on the regional planning map (RTRW) and approval (SK No.936/Menhut-II/2013 and SK No.733/Menhut-II/2014) from the Ministry of Forestry, the concession area of PT KPAM was supposed to be allocated for other use (APL) or non-forestry cultivation areas. The Forest and Waters Area Designation Map (PPKH, 2014) and Indicative Map of New Permit extended by Ministry of Living Environment and Forestry (MoEF, 2016) are the most recent updated map resources of forest and water. The map is available as an appendix in the MEF Decree No. SK.6347/MenLHK-PKTL/IPSDH/PLA.1/11/2016, dated on 21 May 2016 and included to revision XI with the scale 1:250.000 (consist of 291 pieces with JPEG format). The piece of 1413 and 1513 are represented the surroundings of the KPAM IUPs area.

Indicative Map of New Permit Postponement (PIPPIB) revision 11 designated on November 21st, 2016 has shown that the IUPs PT KPAM area is outside of the Primary Forest area, Conservation Forest or Protected Forest and it is also no peatland area into the project site.

In addition, the company also obtained Plantation Business Permit (Ijin Usaha Perkebunan) on Nov 27, 2015 from Regent Ketapang (SK.772/DISBUN-D/2015, for 11,000 ha and mill capacity 45-ton FFB/Hour). In 2017, PT KPAM granted with the Extension of Plantation Business Permit No. 1507/DPMPSTSP-D/2017 for 11,000 Hectares. PT. KPAM also conducted an Environment Impact Assessment (AMDAL) which

received the approval of ANDAL Framework by West Kalimantan Governor via letter No 12/2015. An environment feasibility permit no. 715/KLH-B/2015, was issued on October 28, 2015 by the acting Regent of Ketapang.

PT.KPAM has conducted socialisation and consultation with surrounding communities (Village Head, BPD, Adat people, and other community representatives) to disseminate their land development plan for oil palm. A socialisation event was conducted in Jambi Village on 27th February, 2016 and as a result, the community of Danau Buntar Village, Jambi Village, Sukaramai Village at Kendawangan and Manis Mata District, Ketapang, West Kalimantan have agreed and communities support the development of oil palm plantation by PT. KPAM. PT KPAM has also conducted a High Conservation Value (HCV) Assessment study, Land Use Change Assessment (LUCA) study, Carbon Stock Assessment (CSA) study, Social Impact Assessment (SIA) study, High Carbon Stock (HCS) Assessment study and Peat land Assessment study by an independent consultants, namely Aksenta. PT. KPAM has obtained the following legal documents.

There were 5 (five) identified HCV categories based on field observation and analysis, i.e. HCV 1, HCV 3, HCV 4, HCV 5, and HCV6. HCV 2 category did not exist in the assessment area. Even though HCV 5 was not present in PT KPAM's concession boundaries but **there was HCV5MA** to protect HCV5 area located outside of the concession boundaries. HCV 5 MA in the PT KPAM area was riparian and floodplain of Brais river.

Table 2: List of legal documents

License of Establishment/ Deed in Corporation	: • Notaries Titik Krisna Murti Wikaningsih Hastuti, SH,M,Kn, No. 12 dated 22 February 2007, as replaced Notaries Surjadi, SH. • Notaris Titik Krisna Murti Wikaningsih Hastuti, SH,M.kn.No.38 dated December 2007, regarding board changes of license of establishment. • Notaris Muhamat Hatta, SH. No.5 dated January 11, 2010 regarding Amendments and changes of PT KPAM share capital
Capital Status	: • Foreign Investment (Penanaman Modal Asing, PMA) • Letter of approval of status change from Non Foreign Investment (NON PMDN/PMA) to be Foreign Investment (PMA), No. 265/V/PMA/2007, No NKP.5121/5122/5150-31-22239 by Badan Koordinasi Pemanaman Modal.
Company Registration (Tanda Daftar Perusahaan)	: • 09.03.1.46.52630, expiry : 4 June 2017 by Cooperation, Trading and Industrial Department of Ketapang Regency, West Kalimantan.
Status Business Land	: • Tax Notification Number, No. 02.596.768.8 – 703.000 • Company Registration (Tanda Daftar Perusahaan-TDP), 09.03.1.46.52630, expiry: 4 June 2017. • Permitted Area (<i>Izin Lokasi</i>), Decision of Regent Ketapang via SK No. 365/2007, dated 24 September 2007 by Regent Ketapang with a total area of 20,000 ha. • Extension of permitted area (<i>Perpanjangan Ijin Lokasi</i>), SK No. 416/2010, dated 27 July 2010 by Regent Ketapang (c. 11,000 ha) • Recommendation letter from Regent Ketapang No.100/1193/PEM, regarding permit PT KPAM • Decision of the head of the local environment agency head of West Kalimantan province, as chairman of chief appraiser of SEIA No.12 Year 2015. • Plantation Business Permit (<i>Izin Usaha Perkebunan</i>), SK No. 772/Disbun-D/2015, dated 27 November 2015 by Pj. Regent Ketapang (c. 11,000 ha and mill capacity: 45 ton TBS/hour).

- Recommendation letter from Regent Ketapang No.100/5112/PEM, regarding permit PT KPAM
- Further extension for the permitted area (*Ijin Lokasi*), SK No. 1507/DPMPTSP-D/2017 (dated 18 December 2017) by Regent Ketapang (c. 11,000 ha)
- Approval of ANDAL framework document (*Pengesahaan Dokumen Kerangka Acuan ANDAL*), No.12/ 2015, 28 August 2015 by West Kalimantan Governor
- Environment feasibility permit No.715/KLH-B/2015, dated 28 October 2015 by Pj. Regent Ketapang.
- Environmental Permit regarding plantation activity No.742/KLH-B/2015, dated 3 November 2015 by Pj. Regent Ketapang.

The proposed area to be developed for year 2018 is about 3,000 Ha, while in 2019 about 4,598.30 Ha. 20% of the proposed planting area will be allocated for PLASMA Scheme as required the government regulation. The management of PT KPAM has decided to excise 2,871.47 Ha for HCV areas including HCVMA, 467.46 Ha for Peatland area and 62.77 Ha for others (nursery and emplasment)

Figure 1 and Figure 2 show the location of the PT Kalimantan Prima Agro Mandiri (KPAM) at Country level and Province & Kabupaten level, respectively

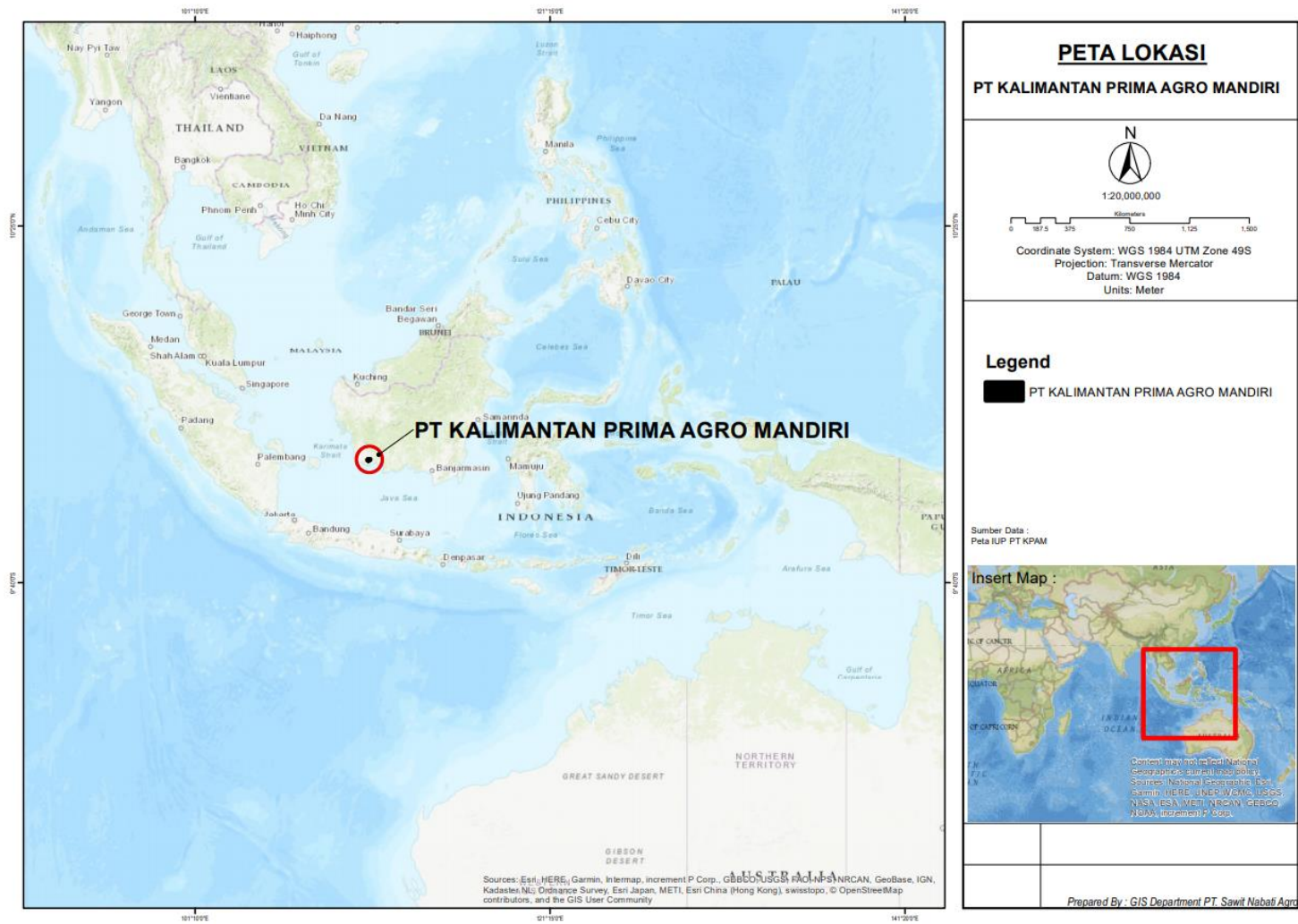


Figure 1: Location map of PT Kalimantan Prima Agro Mandiri (Country Level)

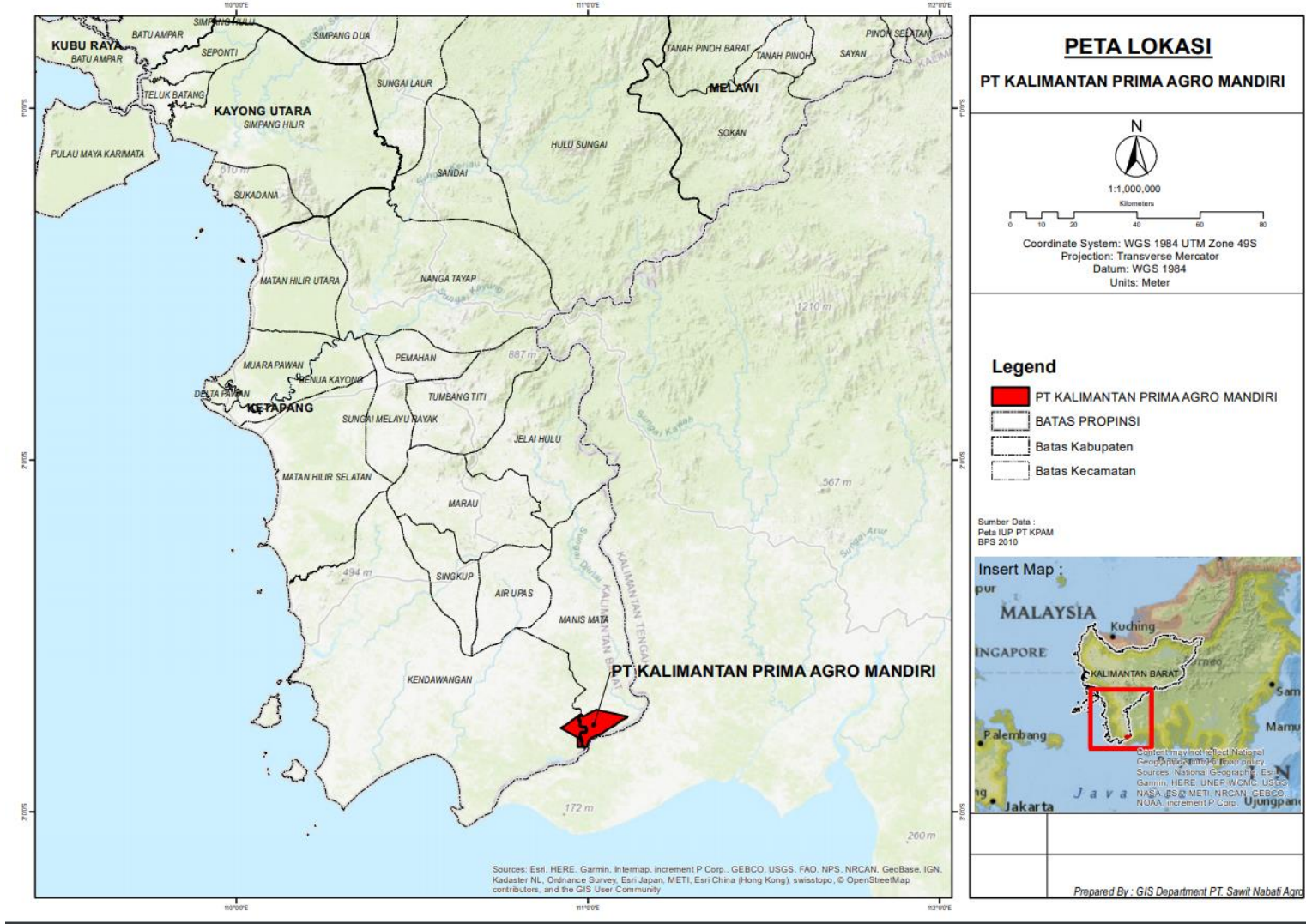


Figure 2: Location map of PT Kalimantan Prima Agro Mandiri (Province & Kabupaten level)

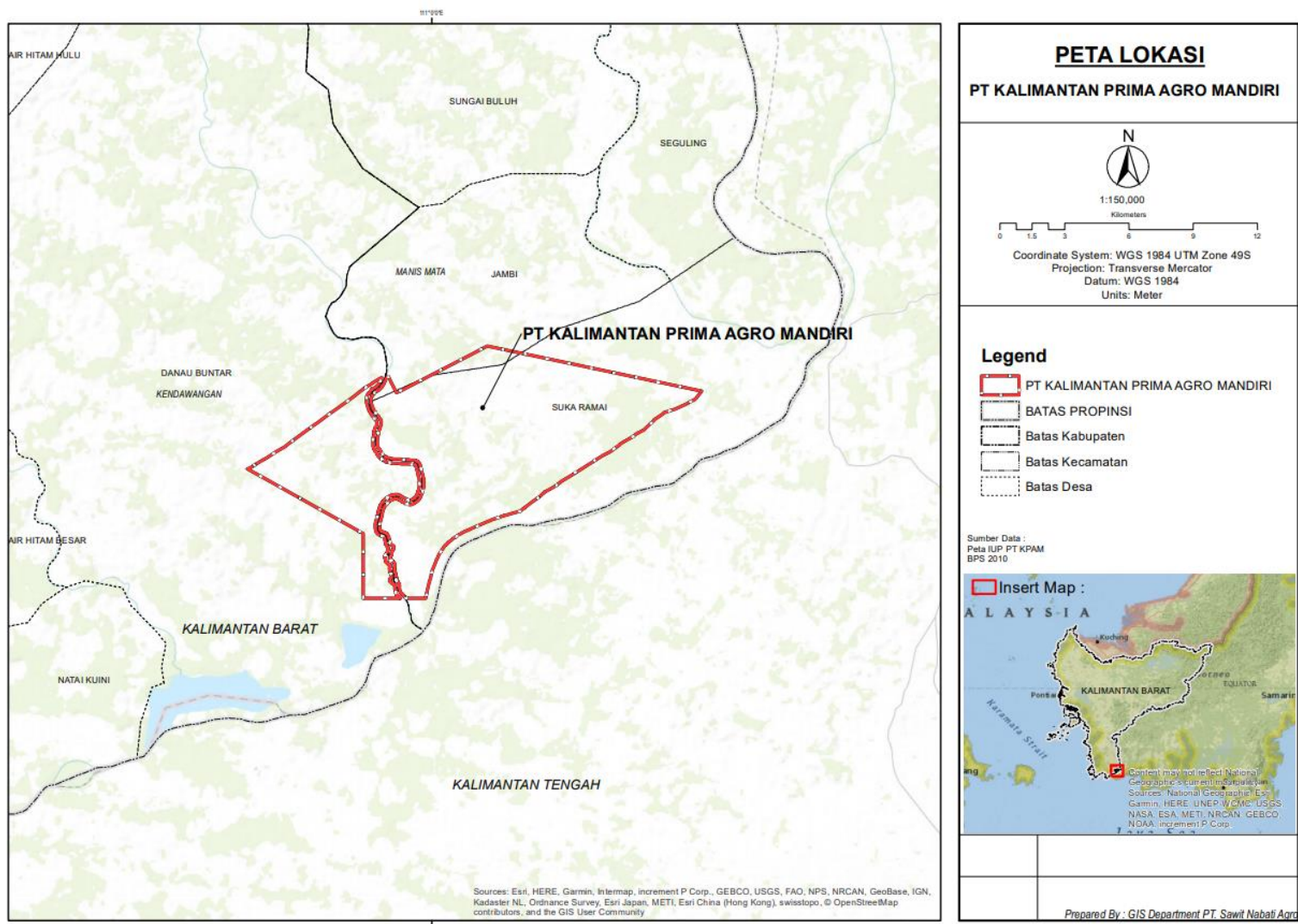


Figure 3: Map of the concession area with the location of the surrounding villages and province

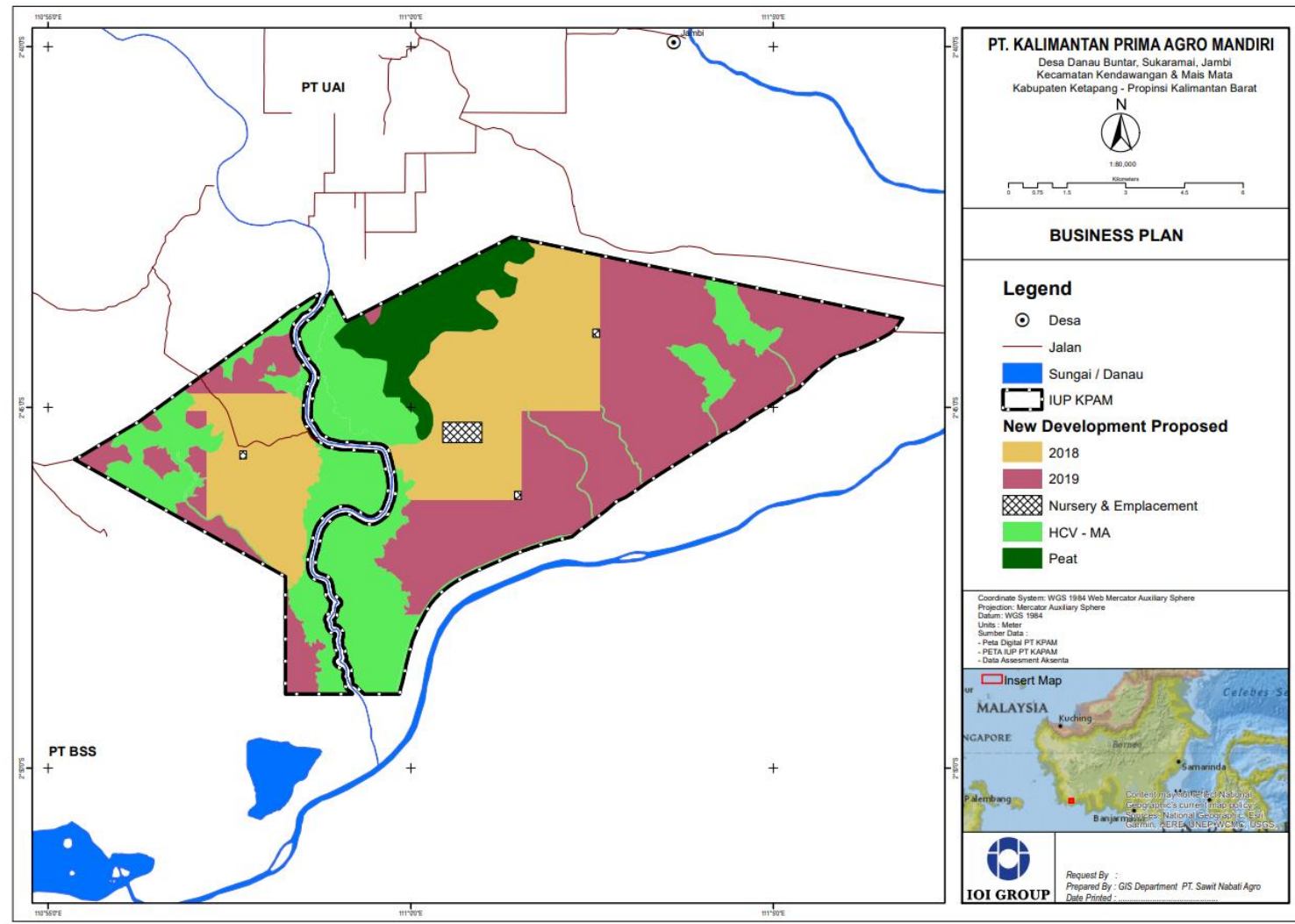


Figure 4: Map showing proposed New Planting Area (which was originally planned in 2017) in PT. KPAM

The above **Figure 4** is the proposed new planting area (with the available planted area 7,251.11 Hectares). The proposed area to be developed for plantation in year 2018 is about 3,000 Ha, while in 2019 about 4,251.11 Ha. 20% of the proposed planting area will be allocated for PLASMA Scheme as required the government regulation. The management of PT KPAM has decided to excise 2,871.47 Ha for HCV areas (HCVMA) including 1022.40 Ha overlap with peat areas (in ID01, ID02, ID03, HCVMA 01 and HCVMA 03 & 4). The total size of peat land areas that is located outside HCV area is 814.65 Ha.

The following table shows the details of the proposed new planting area with hectarage to be developed for each land cover

Areas	Land Use	Year 2018 (ha)	Year 2019 (ha)	Total (ha)
Areas to be excised and protected from new development	HCV Area, Peatland Area Overlapped with HCV & HCV MA	2,871.47		2,871.47
	Peatland area located outside HCV Area	814.65		814.65
Nursery and Emplacement	None HCV area, HCVMA and Peatland area	62.77	0.00	62.77
Potential areas for new oil palm development	None HCV area, HCVMA and Peatland area	3,000	4,251.11	7,251.11
Total Area				11,000.00

2. INTRODUCTION AND ASSESSMENTS

This document presents the summary of assessment that was carried out as an input for the preparation of the NPP document. List of assessment includes (i) Social Impact Assessment (SIA), (ii) Environment Impact Assessment (EIA), (iii) High Conservation Value (HCV) Assessment, (v) Land Use Change Analysis (LUCA) Assessment and (vi) High Carbon Stock (HCS) in PT KPAM – Kalimantan, Indonesia. This document also presents the management plan to address all the recommendations that is highlighted in the above-mentioned assessments.

High Conservation Values Assessment Report for PT Kalimantan Prima Agro Mandiri (PT. KPAM) was submitted to High Conservation Value Resource Network, and evaluation was made. HCVRN (with their letter dated 24 November 2017) confirm that the HCV assessment was satisfied and complies with the guidance provided in the 'HCV Assessment Manual' and other relevant documents, tools and templates.

2.1 SOCIAL IMPACT ASSESSMENT

2.1.1 Dates and Duration of the Assessment

The Social Impact Assessment was carried out in the PT. KPAM area, including the adjacent area and villages, from 4th to 11th October 2015.

2.1.2 Background of the Assessors

Table 3: The members of the SIA Consultant team with their expertise

No.	Name	Role	Credentials
1	Nandang Mulyana	Team Coordinator	<p>Qualification Economics S1 at UMJ, Jakarta and S2 program of Regional and Rural Development Planning (PWD) at IPB Graduate School</p> <p>Publication(s) Co-authored - "Dissecting UMKM Indonesia; A Study on Strategy of Empowerment and Development of UMKM in Indonesia", published by Lugas.</p> <p>Awards and Trainings Accredited by RSPO as a Discipline Specialist for HCV study on oil palm plantations (2010); Attended ISPO Auditor training, as well as ISCC (2013); Licensed Assessor (Year 2015)</p> <p>Current attachment and experience Currently attached with Aksenta and has conducted a study "Social Impact Assessment "and" High Conservation Value Assessment "in many oil palm companies in Indonesia</p>
2	Noor Rakhmat Danumiharja	Team Member	<p>Qualification Bachelor of Forestry, Department of Forest Management</p> <p>Awards and Trainings Basic Environmental Impact Analysis, PPLH ITB (1984); Natural Resources Conservation Management Course, Bogor; Wildlife Conservation and Management Training Course PNS; Investigator Criminal Investigation Police Headquarters</p> <p>Current attachment and experience Ministry of Forestry at Bukit National Park Hall South Line in Lampung (1982-1988), at West Java Natural Resources Conservation Hall during (1999-2005), at Gunung Gede</p>

			Pangrango National Park Office (2005-2007), last worked at the Directorate of Forest Investigation and Investigation (2007-2012)
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2.1.3 Methodology of the Social Impact Assessment (SIA)

The implementation of the Social Impact Assessment (SIA) is carried out based on the following rules or principles:

- a. Participatory mapping - also called community-based mapping - is a general term used to define a set of approaches and techniques that combines the tools of modern cartography with participatory methods to represent the spatial knowledge of local communities.
- b. Multi-party: Multi-party initiatives involving issues identification, which is aiming at environmental sustainability and social equity, face complex tensions between institutionalized decision-makers, backed up by expert knowledge, and communities with locally embedded knowledge and interests.
- c. Rapid and Ex-ante: Rapid identification of issues and extraction of information which is based on forecast against tendencies/changes rather than based on accurate factual data as a solution to the limitations of the approach in Social Impact Assessment, including limited available timeframe.
- d. Appreciative: identification of issues and key information, that is not limited only to the gaps identification but also to explore expectations, ideas, potential solutions to the social issues.
- e. Social Learning Cycle: Social Impact Assessment is conducted through the cycle scanning process, where new knowledge is created through problem-solving activities as a respond to the environmental changes that occurred.

The implementation stages in the field includes:

1. Introduction Meeting: Introduction meeting was held with the company (represented by the management of plantation and mill). In this meeting, an orientation approach was used to facilitate the field activities; socialization of Social Impact Assessment, the identification of relevant parties, scheduling and technical preparation of the fieldwork;
2. Stakeholders Mapping and Field Scoping was carried out to obtain preliminary data accordance to the perceptions of key operational and executing stakeholders.
3. Field observations: carried out on locations where issues or social impacts arise or occurred, as well as other locations, which deemed important to find facts on the ground as an indication of changes, including taking photographs. This method is used to understand the ground conditions and facts which could be used to identify the potential social impacts
4. In-depth Interviews: Interviews were conducted with the operational executives of the company, formal and informal leaders, government officials (village, sub-district and district) and community members from various professions and social strata around the company's operations. This method aims to explore and acquire a deeper understanding of the issues that arise conducted in-depth interviews with key figures, the informant was selected based on their knowledge or parties who are directly affected.
5. Focus Group Discussion or FGD: Discussion was carried out with employee representatives and the plantation. This method is used to identify the relevant parties, relevant issues, determine the expectations, ideas and aspirations for suitable solutions through series of meetings (both formal and non-formal) and focuses on specific topics.

6. Document Review: relevant information is obtained from the documents provided by the company as well as other documents from other relevant sources that is available on site, as guidance to understand the social and environmental context;

7. Closing Meeting: Draft of final findings was presented to all relevant management team of the company, feedbacks were received and amendments and recommendations is done.

Data Analysis Methods and Information

The findings from the field were then analyzed to understand more on their mutual relationship, and then synthesized to draw the conclusions. A framework for analysis of the results was developed using criteria that have relevance to the social aspects of sustainability as well as changes in elements of the asset pentagon. In addition, impact analysis was also conducted with respect to the guidelines regarding the size of the impact. Each issue has a significant impact on the described circumstances and elements of the asset pentagon.

2.2 ENVIRONMENT IMPACT ASSESSMENT

2.2.1 Dates and Duration of the Assessment.

The Environmental Impact Assessment was conducted in the beginning of year 2015 and the report was finalized in October 2015.

2.2.2 Background of the Assessors

Table 4: The member of EIA Consultant team with their expertise

No.	Name	Role	Credentials
1	Derry Yulianto S Hut	Lead	BSc Forestry, A & B EIA Assessor certificate, GIS, Lead Status endorsed by the Indonesia authority (KTPA)
2	Eva Aprilia M.E	Socio-economy	MSc Economy, EIA certificate Assessor, Lead Status endorsed by the Indonesia authority (KTPA)
3	Ir. Iswan Dewantara	Biology	BSc Forestry, A & B EIA Assessor certificate, Lead Status endorsed by the Indonesia authority (KTPA)
4	Afrita Galih Pangestu SKM	Socio-public health	BSc Public Health, EIA Assessor certificate, Lead Status endorsed by the Indonesia authority (KTPA)
5	Ir. Darea MS	Physic-chemical attributes	Bsc Agriculture, MSc Soil Science
6	Rodiman S Hut	Biology	BSc Forestry

2.2.3 Methodology of the Environment Impact Assessment

The methodologies that is used in the Environment Impact Assessment comprises

- (i) Primary Data Collection
- (ii) Secondary Data collection
- (iii) Analysis of the potential impact

Primary data collection: Primary data was collected through surveys and observations for biological, physical, and chemical parameters; and social, economic, cultural, and public health information through focus group discussions and individual interviews with the stakeholders including the local communities.

Secondary data collection: Data was collected either through a secondary data from relevant research results, or other studies within the same industry and region, as well as data from relevant government authorities.

Data on physical & chemical components were collected which include air quality, noise levels, surface water quality, soil properties, climate, and rainfall. Biological components that is collected, include flora and fauna diversity, while data on socio-economic and cultural components were collected comprises population density, mortality, structure of community, race, religion, sex ratio, livelihood, consumption pattern, income, infrastructure, gross regional product, community institution, culture, community perception on environment and the proposed project, social interaction, and other parameters reflecting the socio-economy & cultural conditions of the community. Public health data components that were collected include sanitation, access to public health and medical facility, nutrition, medical services including number of facility and medical personnel.

Based on the data collected, qualitative and quantitative analyses are developed in order to support the identifying of the negative and positive impacts, which may occurred during the development of the oil palm plantation. The methodology that is used to assess the impacts is based on the references that is available in this document "Kepka BAPEDAL No:56 in 1994."

2.3 HIGH CONSERVATION VALUE ASSESSMENT

2.3.1 Dates and Duration of Assessment.

The duration of the HCV assessment in PT. KPAM is about eight months, started from March 2015 to February 2017. Desk study and pre-assessment was conducted in March 2015, while field surveys were carried out in 2 phases, which the 1st Phase was conducted during the period of April to May 2015 and 2nd Phase as conducted from March to April 2016. Public consultations were carried from April 2015 and March 2016. Data analyses and report preparation was conducted from May to June 2015, and final report is reviewed and finalized in February 2017.

2.3.2 Background of the Assessors

The Lead assessor of the HCV assessment for PT. KPAM is a provisionally-licensed assessor (ALS15029IR) and the HCV report has prepared with ALS template for HCV public summary report and had been evaluated by the HCV-RN (ALS quality control system) with satisfactory status. Table 5 shows the list of the assessors including their background.

Table 5: List of HCV Assessors (Members of the Aksenta)

No	Name	Role	Credentials
1	Idung Risdiyanto	Team Leader, Assessor on Environmental Services (HCV4)	<i>Hydrologist</i> , soil conservation, spatial analysis, remote sensing, water management system. Provisionally Licensed Assessor (ALS15029IR) Experienced in HCV assessments since 2007.
2	Tedi Setiadi	Assessor on Biodiversity (HCV1-3)	<i>Ornithologist</i> , facilitator on community biodiversity assessment, Research and Management of Wild animals, participatory mapping, Experienced in HCV assessment since 2012
3	Reza Ahda Sabiila	Assessor on Biodiversity (HCV1-3)	Botanist, research and survey of ecology and tropical plant biodiversity. Identification of forest vegetation for biomass carbon stock
4	Fuad Say Benny	Assessor on Social and culture (HCV 5 and HCV 6)	Social and culture Sciences expert. Area planning and village development, conflict management, and participatory mapping. Experienced in HCV assessment since 2009
5	Ryan Karida Pratama	GIS Specialist	Remote Sensing, for biological conservation and land use issues.

2.3.3 Methodology of the High Conservation Value Assessment

The HCV assessment uses several references to assess the HCV area. The main reference used is the *Common Guidance of the Identification of High Conservation Values* (Brown et al, 2013) and the supporting references are as follows: (i) *The High Conservation Values Forest Toolkit* (ProForest, 2003), (ii) *Konsorsium Revisi HCV Toolkit Indonesia* (2008), and (iv) *Common Guidance for the Management and Monitoring of HCVs* (Brown , 2014). This HCV assessment uses HCV Assessment Manual issued by HCVRN in 2014 for an Assessment License Scheme of the Year 2015.

HCV assessment of PT KPAM consisted of five main stages, i.e. (i) pre-assessment, such as desktop-based study; (ii) field assessment (field work); (iii) stakeholder consultation; (iv) data analysis and mapping; and (v) verification and delineation of the definitive HCV area (see Table 6)

(i) Pre-assessment (desktop-based study)

The objectives of the desktop study are to identify the indications of the presence/absence of HCV area and their attributes based on secondary data and to understand the landscape context and the conservation issues in the study area. The secondary data and their utilization in this study are as per described in **Table below**

No	Secondary Data	Used for
1	<p>Base map and government thematic map:</p> <ul style="list-style-type: none"> ▪ Indonesia base map scale 1:50000 (source: source : BIG - Indonesia geospatial information agency) ▪ Map of IUP of PT KPAM (source : PT KPAM) ▪ Map of Conservation Area of West Kalimantan Province (BKSDA Kalbar, 2009) ▪ Regional Spatial Plan (RTRW) Ketapang District 2001-2010 (source: Bappeda, Ketapang) ▪ Indicative Maps of Moratorium on Permitting New Permit (PIPPIB) Forest Utilization, Use of Forest Areas and Changes of Forest Area Allocation and Other Use Areas Revised 8 (May, 2015) (Source: Ministry of Forestry) ▪ Land system map of RePPPport (source : BIG - Indonesia geospatial information agency) ▪ Map of Jelai River Region (Ministry of Public Works, Director General of Natural Resources) ▪ Map of Watershed in West Kalimantan Province (BPDAS Kapuas) ▪ Map of village administration (Sumber: BPS, 2012) 	<p>Site location description</p> <p>Field work plan</p> <p>Land use analysis</p> <p>Landscape context analysis</p> <p>Ecosystem mapping and analysis (HCV3)</p> <p>Village map (HCV5)</p> <p>Water catchment analysis (HCV4)</p>
2	<p>Landsat 8 satellite imagery Path/Row 120/062 (source USGS, 2010 and 2015)</p>	<p>Existing and historical of land cover (HCV1, 2, 3, 4 and 5)</p> <p>Ecosystem mapping (HCV1,3 and 4)</p> <p>Flood area analysis (HCV4)</p>
3	<p>Map of intact forest landscape (http://www.intactforests.org)</p>	<p>Landscape analysis (HCV2)</p>
4	<p>Digital evaluation model -SRTM90m (source : Contour map from Indonesia base map scale 1:50000)</p>	<p>Topographic analysis (HCV4)</p> <p>Land physiographic analysis (HCV4)</p> <p>Surface hydrology characteristic (HCV4)</p> <p>Water catchment analysis (HCV4)</p>
5	<p>Soil map from the attribute of RePPPport map scales 1:250000 (Source: source : BIG - Indonesia geospatial information agency)</p> <p>Soil map of PT KPAM (source : PT KPAM)</p>	<p>Soil and land evaluation for ecosystem services (HCV4)</p>
6	<p>Document and literature:</p> <ul style="list-style-type: none"> ▪ The Ecology of Kalimantan. Periplus Edition, HK. (MacKinnon, et al., 2006) ▪ Field Guild to The Mammals of Borneo (Payne dkk. 2000) ▪ Burung-burung di Sumatera, Jawa, Bali dan Kalimantan (MacKinnon, et al. 2000) ▪ Kura-kura dan Buaya Indonesia & Papua Nugini (Iskandar, 2000) IUCN Red List of Threatened Species. www.iucnredlist.org ▪ Appendices I, II and III, valid from 14 April 2014 (CITES, 2014) ▪ Endemic Bird Area Factsheet: Borneo (BirdLife International, 2012) ▪ Important Bird Areas in Asia: Key Sites for Conservation (Birdlife International, 2004) ▪ Area Ramsar di Indonesia, sumber: http://www.ramsar.org ▪ Kajian Ekosistem Pulau Kalimantan (Prihatna/WWF Indonesia, 2009) ▪ HCV Identification of PT BSS (Aksenta, 2010) (Oil palm plantation at west side of PT KPAM site) ▪ Carbon stock assessment of PT KPAM ▪ Peat survey and mapping of PT KPAM (Aksenta 2014) ▪ Soil survey and Land suitability of PT KPAM 	<p>Potential presence of species in the study area (HCV1)</p> <p>Site and habitat of migration species (HCV1)</p> <p>Landscape analysis (HCV2)</p> <p>Plant and animal for culture identity (HCV6)</p> <p>Landscape analysis (HCV2)</p> <p>Type of ecosystem analysis (HCV3)</p> <p>Reference for : potential presence of species in the study area (HCV1), wider landscape (HCV2), ecosystem types (HCV3), ecosystem services (HCV4), Utilization of natural resources (HCV5) and cultural (HCV6)</p>
	<ul style="list-style-type: none"> ▪ Statistic of Ketapang District (Regency of Ketapang, 2015) ▪ Statistic of Kendawangan sub district (Regency of Ketapang, 2015) ▪ Statistic of Manismata sub district (Regency of Ketapang, 2015) ▪ AMDAL document 	<p>Socio economic data (HCV5)</p> <p>cultural data (HCV6)</p>

(ii) Field assessment (field work)

In general, field activities are conducted to verify the desktop studies such as land cover, data collection on the species information, ecosystem type, land physiographic, soil type, hydrological characteristics, socioeconomic and cultural conditions. Field activities divided six types of HCV into 3 study groups, namely: (i) biodiversity, landscape and ecosystem (HCV 1-3), (ii) ecosystem services (HCV 4), and (iii) socio-economic and cultural (HCV 5-6).

Observation of the animal species, ecosystem, land physiographic, hydrological condition and soil type using transect lines as a guide. The plant species observed in the sample plot whose location follows the transect line. As for the socioeconomic and cultural survey which are the settlement of villagers and locations of natural resource utilization. The total number line transects is 16, with 26 plot plants observation. There are also random locations for opportunistic observations and most of them are outside the IUP area of PT KPAM.

Field activities for HCV1-3 : biodiversity, landscape and ecosystem; Field observations include one or more of the following characteristics: (i) natural ecosystems that include rare or endangered ecosystems; (ii) natural ecosystems that are part of the ecological landscape; (iii) rare or endangered, endemic or limited-range wildlife species; (iv) areas potentially used temporarily by wildlife for migration, migration routes, corridors, including refugium areas; and (v) habitat connectivity.

The identification of the presence of animal wildlife species is based on one or more of the following field indicators: (i) spotted, (ii) sounds, (iii) traces or abandoned signs (eg treads above ground, scratches on tree trunks, dirt, nest, remnants of body parts such as outer shell/scales / feathers/hair, skull, horns, fangs, or other recognizable body parts). Information on the presence of animal wildlife species was also obtained from interviews with local people (eg hunters, farmers, fishermen). Identification of plant species using observations in the sample plots. Within each observation plot consists of 5 subplots to record plant species according to the diameter of the tree at breast height (dbh), ie (i) sub-plot 40x40 meters for dbh > 35 cm, (ii) sub-plot 20x20 meters for dbh 20 (iv) 5x5 meter sub-plot for dbh 2-10 cm and (v) 1x1 meter sub-plot for the species at the seedling level, shrubs and herbaceous. The results of this plant analysis are also used to describe the ecosystem condition and land cover verification.

Field activities for HCV4 : ecosystem services; Data collection in the field is to verify the presence of HCV attributes or ecosystem services within the study area. Observations were conducted on aspects of land cover, land physiography, soil type, hydrological characteristics, landfire marks, microclimate and proxy indicators for pollinators. For effectiveness and consistency, the basic questions to be answered from each observed object are the role, value, function, and benefits of ecosystem services, so they are essential for conservation.

Field activities for HCV5-6 : socioeconomic and cultural; Data and information collecting was done by (i) semi-structured interview, (ii) focus group discussion (FGD) and (iii) observation of field evidence. Interviews and FGDs focused on understanding the following four issues: (i) natural and land resources within the areas of study utilized by the community, (ii) parties or groups of social strata or economic strata within communities that utilize natural resources and / or land, (iii) utilization purpose, and (iv) management pattern from utilization of natural resources and community land. The accuracy of data and information is verified by triangulation method, i.e. asking the same questions to other sources and examining the field evidence.

(iii) Stakeholder and public consultation

Stakeholders consultation is essentially carried out in every activity phase. Public consultation was held by presenting representatives of local key stakeholders in the assessment area such as local communities (community leaders, village government), sub-district government, and other relevant government institutions at district level, in addition to NGOs and companies operating around the assessment area. Public consultations main objectives are: (i) to communicate the output of field findings and analysis by the HCV assessment team; (ii) to collect additional data and information and obtain clarification over the field findings; and (iii) to collect input for report writing and recommendation, as well as HCV Management Plan.

(iv) Data analysis and mapping

All coordinates of areas with HCV attributes or elements were mapped on the work map. Information on such locations was used to identify places in the area with similar features based on satellite image interpretation. Such similar field characteristics, in case of HCV 1-3 and HCV 5-6, took the form of similar types of land cover or ecosystem (e.g. dense forest, secondary forest, shrub, mixed rubber plantation, lake, river or swamp). In the case of HCV 4, similar field characteristics may have taken the form of areas with steep slope, stream, riverbank, bank of open water bodies or depressed area (lowland, basin).

(v) Delineation of the definitive HCV area

Further field survey is necessary to generate definitive HCVA map. Field delineation is conducted to collect the coordinate points within boundaries of the indicative HCV area, then creating a line connecting the coordinate points as a boundary. The results of this delineation process are further mapped as revisions to the indicative boundaries of the HCV area resulting from this HCV study. In the delineation process, consider the following; (i) to areas with HCV values of biodiversity, landscapes and ecosystems (HCV1-3) should be ensured that the presence of HCV elements in them can be well protected, (ii) to ecosystem services (HCV4) should ensure that delineation boundaries can protect their function (iii) to the HCV 5 and 6 areas it should be ensured that delineation limits can ensure the sustainability of its utilization and cultural value.

Table 6 shows the HCV assessment activities and timeline.

Table 6: HCV Assessment activities and timeline

Activities	Dates of major events	Place
Desk study & Pre-assessment (Preparation and preliminary study)	March 2015	Aksenta Office, Jakarta
Field Work on biodiversity survey, environment services survey and social survey Meeting with KPAM management	23 April 2015-4 May 2015	IUP PT KPAM area, and its surrounding areas which include peat land moratorium (West side), Belida Lake, production forest (North side), development plan area (KSCT) of Manismata Subdistrict and river buffer of Jelai river and Brais river, areas that is located nearby Danau Buntar, Sukaramai, Natai Kuini, Jambi and Nibung village.

Public consultation & participatory mapping	27 April 2015	Meeting Room at Danau Buntar village
Data analysis, mapping of HCV areas.	May 2015	Aksenta Office, Jakarta
Establish guideline as a basis to define the HCV areas.	May 2015	Aksenta Office, Jakarta
Regular monitoring of HCV areas by internal team of PT KPAM, supervised by HCV assessment team.	May 2015 – February 2016	IUP PT KPAM area
Delineation and demarcation of HCV areas by the PT KPAM survey team, supervised by HCV assessment team.	February – March 2016	IUP PT KPAM area
Public consultation and Field assessment (Verification and delineation of the identified HCV areas)	14 March 2016 - 10 April 2016	IUP PT KPAM area and villages surroundings, such as Danau Buntar village, Sukaramai village, Natai Kuini village, Jambi village and Nibung village; Aksenta Office, Jakarta
Report writing and revising	April 2015-February 2017	Aksenta Office, Jakarta
Stakeholder consultations	March 2016 – February 2017	By email, Skype, and direct interview with NGO and scientist.
Peer review and finalizing	February 2017	Jakarta

2.4 SOIL AND TOPOGRAPHY ASSESSMENT

2.4.1 Dates and Duration of Assessment

The soil suitability study assessment was conducted throughout the year 2016, and final report was submitted in September 2016.

2.4.2 Background of the Assessors

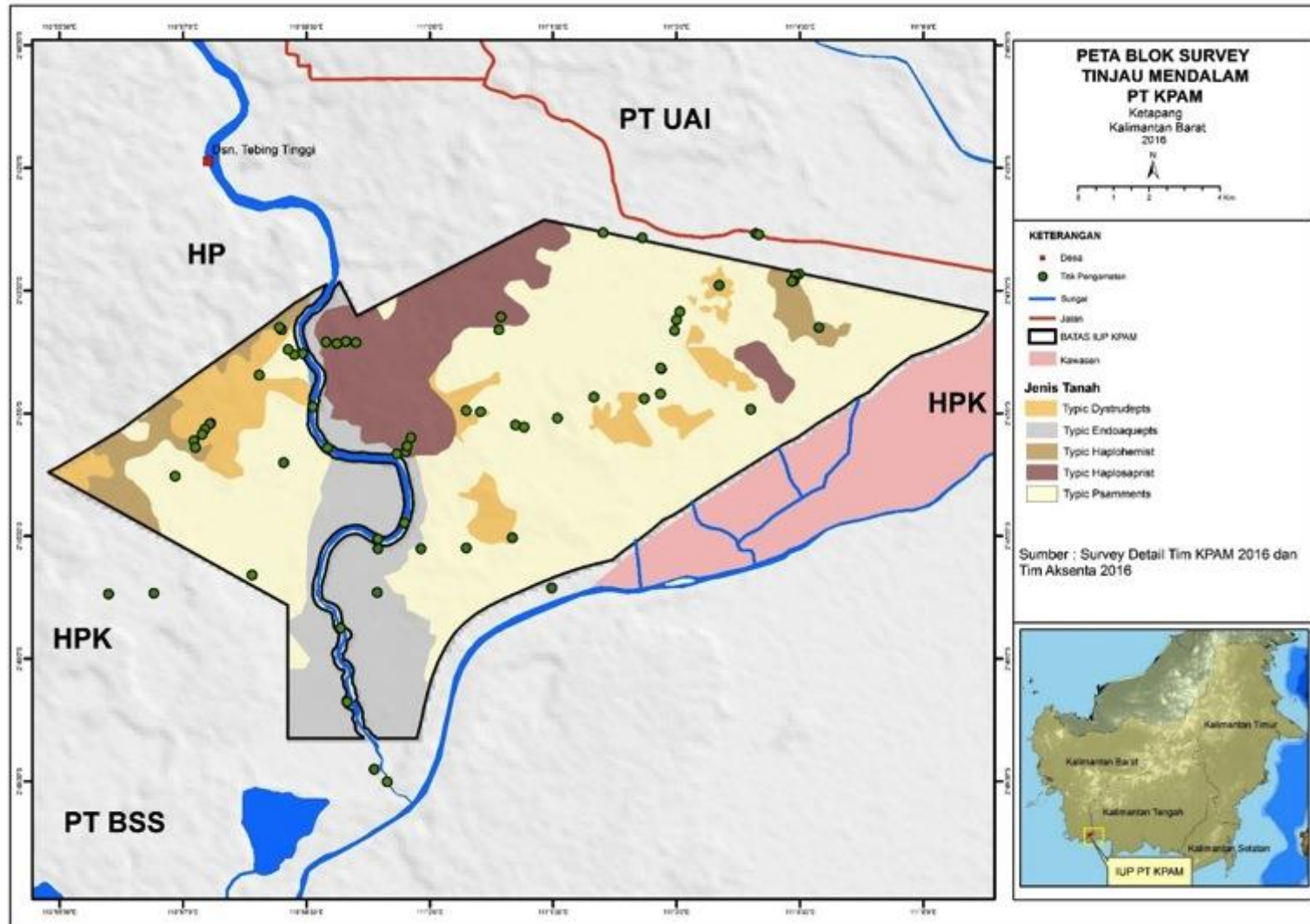
Table 7: Soil experts with their expertise

No	Name	Role	Expertise
1	Idung Risdiyanto	Hydrologist	Soil conservation, spatial analysis, remote sensing, water management system. Experienced in HCV assessment since 2007.
2	Aulia Bahadhori Mukti	High Conservation Value (HCV), GIS Mapping	Peat land conservation and identification of timber industrial and oil palm plantations. Identification of soils, Experienced in HCV assessment since 2010

2.4.3 Methodology of Soil and Topography Assessment

The methodology used for the soil suitability study comprises of six stages, which includes; (i) Desk study; (ii) Field survey; (iii) Interim report development; (iv) Laboratory analysis; (v) Mapping and analysis, and (vi) finalization of the report.

Figure 5: Sampling plots for soil analysis within PT KPAM area



The soil survey in the field was conducted based on the Map of land system under RePPPRoT, and sampling was carried out through a stratified random sampling. The locations of sampling points are shown in Figure 5 above.

Figure 6 shows the workflow of Soil and Topography Study for PT. KPAM

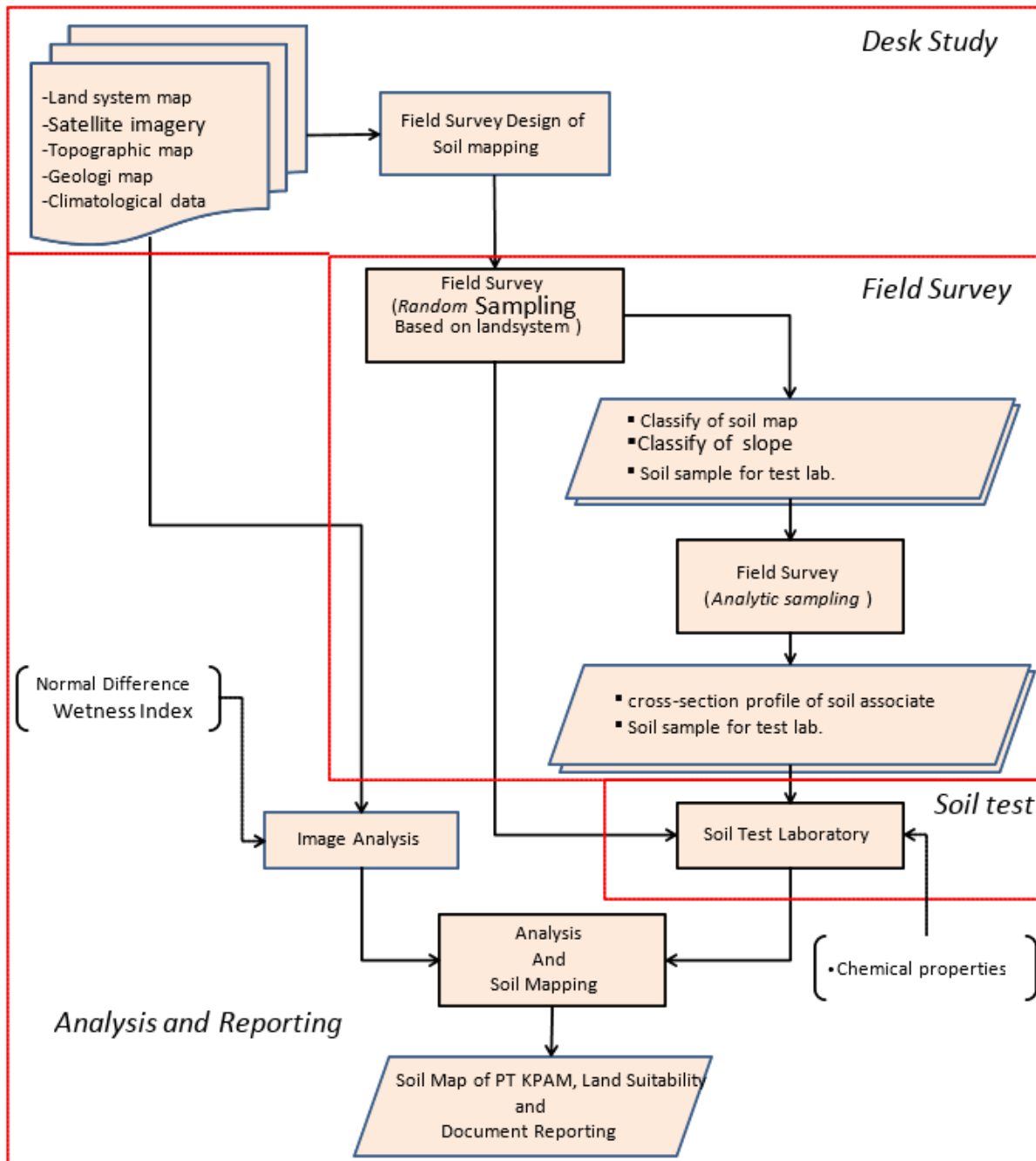


Figure 6: Workflow of the Soil and Topography Study

2.5 CARBON STOCK ASSESSMENT AND GHG EMISSIONS

2.5.1 Dates and Duration of the Assessment

Desk study was conducted earlier from 8th to 15th June 2015, followed by CSA fieldwork. was conducted in PT. KPAM from 16th to 26th June 2015. The Carbon Stock Assessment and GHG Emissions was carried out in a period of three months. The stages of the study consisted of i) Desk study, ii) Field Study, iii) Data analysis and Mapping, and iv) Reporting.

2.5.2 Background of the Assessors

Table 8: CSA Assessors with their expertise

No	Name	Role	Credentials
1	Idung Risdiyanto	Lead	MSc in Technology of Natural Resources Management, Degree of Agro meteorology (Bogor Agricultural University) Involve with research on GHG (Green House Gasses) and water resources with UNEP and PPLH IPB in 1997 He is a member of expert team for Department of Forestry of Republic of Indonesia to deal with problems of watershed management in Indonesia since 2007 and teaching Climatology, Hydrometeorology, Application of GIS and Remote Sensing and Meteorological Satellite at Bogor Agricultural University. He is also member of Indonesia Agro meteorological Society, Indonesia Peat Society and Indonesia Remote Sensing Society. Chairman of HCV4 working group (WG) in High Conservation Value Network Indonesia (JNKTI) and HCV Provisional Assessor-HCVRN especially for Discipline Specialist in Environmental Services.
2	Reza Ahda Sabiila	Botanist	Expert in Identification of forest vegetation for biomass carbon stock
3	Yudha Utama	Forest Ecologist	Bachelor of Forestry of Bogor Agricultural University, Expert in vegetation studies and estimations and calculations of tree upright biomass for conservation purposes
4	Aulia Bahadhori Mukti	Peat Soils Identification	Expert in identification of high conservation value areas (HCV) since 2010, environmental services and GIS in timber industrial and oil palm plantations.
5	M.Teuku Haikal	GIS & Remote Sensing Expert	Bachelor of Geophysics and Meteorology of Bogor Agricultural University. Expert in land cover change studies, identification of physical properties of land using remote sensing technology, land wetting indexes in forested areas on peat soils and mineral soils using satellite imagery data.

2.5.3 Methodology of the Carbon Stock Assessment and GHG Emissions

Carbon Stock Assessment

The carbon stock assessment within the PT KPAM was conducted based on three main categories of carbon source as referred in IPCC (2006). This include 1. AGB – Above Ground Biomass and BGB – Below Ground Biomass; 2. Neuomas and litters, and 3. Soil carbon. Due to the estimation of carbon using Neuomas and litter has bias and very high uncertainty, it was not included in the carbon stock assessment.

The assessment of carbon stock for PT KPAM was separated into (i) AGB for all above ground vegetation and (ii) AGB for vegetation with DBH \geq 5 cm. The finding of the carbon stock assessment stated that the total carbon stock within PT KPAM is 4,698 Gg-C or in average 199 ton-C/ha. While the estimated total carbon stock if the AGB is taken into account (from the vegetation stand with DBH \geq 5 cm) is 4,644.8 Gg-C or an average of 196.7ton C/ha. Table 9 below provides the summary of carbon pools within PT KPAM.

Table 9: Carbon pools and methodology for carbon stock assessments, in each stratification.

Carbon pools	Availability* (+/-)	Standard error (ton/ha)	Uncertainty CI95% **)(%)	The method has been applied in the carbon stocks assessment in PT KPAM
1 Above Ground Biomass (AGB) each stratum:				
- Sf (Secondary forest)	(+)	\pm 17.74	24.22	<ul style="list-style-type: none"> ▪ For DBH > 2cm use comprehensive random plot sampling involving measurements of dbh and height of trees and use of allometry to estimate carbon stock. ▪ For DBH < 2 cm and liana, terna, herba (understorey plants) use destructive sampling and direct measurement of biomass ▪ Stratification of land cover using remote sensing and GIS analysis, followed by correlated between plot sampling and vegetation index (remote sensing data) to verify default carbon stock values.
- Sc (Scrub)	(+)	\pm 10.61	24.12	
- BSc (Bush and Scrub)	(+)	\pm 6.48	24.72	
- Bu (Bush)	(+)	\pm 0.39	30.20	
- Op (Bare soil with young oil palm)	(+)	\pm 0.05	9.17	
2 Below Ground Biomass (Root)				
- Sf (Secondary forest)	(+)	\pm 8.71	26.12	Use default ratio (RSR – Root Shoot Ratio) and/or equation for calculating root biomass as a function of aboveground biomass.
- Sc (Scrub)	(+)	\pm 3.34	15.60	
- BSc (Bush and Scrub)	(+)	\pm 4.14	32.88	
- Bu (Bush)	(+)	\pm 0.47	71.21	
- Op (Bare soil with young oil palm)	(+)	\pm 0.03	9.17	
3 Necromass				
▪ Woody debris	(-)	2.49–63.2	17.25-124.48 (very high uncertainty)	for standing dead biomass, measure dbh and height (optional) as with tree biomass (use the allometric and correction factor), for lying dead biomass, measure wood volume and multiply by specific mass/density base on decompose level.
▪ Litters				
- Sf (Secondary forest)	(+)	\pm 2.44	22.91	Destructive sampling – litter collected direct measurement of wet weight and dry weight (laboratorium)
- Sc (Scrub)	(+)	\pm 1.60	12.94	

Carbon pools	Availability* (+/-)	Standard error (ton/ha)	Uncertainty CI95% **)(%)	The method has been applied in the carbon stocks assessment in PT KPAM
- BSc (Bush and Scrub)	(+)	± 1.16	29.76	
- Bu (Bush)	(+)	± 0.07	7.01	
- Op (Bare soil)	(+)	± 4.60	46.36	
4 Soil Carbon	(+)	± 9.60	9.70	Based on the results of the peat mapping assessment by the grid sampling method (Collected the soil physical properties such as bulk density, peat thickness, depth, peat maturity etc. and soil chemical properties such as c-organic content, ash content, C/N ratio etc.)

*) Availability to calculate carbon stocks in the area of PT KPAM (+)available and (-) un-available;

**) Uncertainty for confidence level 95%

Sources of GHG emissions and sequestration

The sources of GHG emissions used in the calculations follow Chase *et al.* (2012)¹ as incorporated into RSPO's PalmGHG calculator which identifies the sources of emissions and GHG fixation in palm oil production cycle. The sources of GHG emissions consist of:

- 1) Emissions due to the removal of carbon stock by land clearing
- 2) Fertilizers production, procurement, transportation to the plantations
- 3) N₂O and CO₂ emissions from fertilizers application in the plantations and management process in the factory (mill) and other organic wastes decomposition
- 4) The fossil fuels used in management activities, especially fruits harvesting and collection
- 5) The fossil fuel used in the factory
- 6) Methane (CH₄) generated by palm oil mill effluent (POME); and
- 7) Emissions of CO₂ and N₂O generated by oil palm cultivation in peatland

The sources of GHG fixation consists of:

- 1) CO₂ absorbed by vegetation in oil palm plantations which consist of oil palms, ground cover plants and carbon stored in the litter or necromass
- 2) CO₂ absorbed by vegetation in conservation areas
- 3) Conversion of energy, i.e. the sale of electricity generated by the power plants of palm oil mills

Besides sources of emissions and fixation mentioned above, there are other sources such as nursery stage, pesticide application in treatment, fuels used for land clearing, emissions from infrastructure and machines used in the process of cultivation and palm oil industry, sequestration carbon in oil products and products and changes in organic-C of mineral soil. Referring to Chase and Henson (2010), seven emission sources and three fixation sources can describe 99% of GHG emissions in production cycle of palm oil.

Thus far RSPO uses sources of emission and fixation mentioned above to calculate and monitor GHG emissions in plantations and palm oil industry and ignores other emissions sources. Chase *et al.* (2012) mentioned in PalmGHG-RSPO that changes in organic carbon by land use changes in mineral soil is not taken into account due to the lack of consensual and reliable data of soil organic carbon stock before and after the establishment of oil palm. Besides referring to RSPO, the study of GHG emissions estimation in PT KPAM included the value of soil carbon stock in mineral area, and it produced two versions of the GHG emission calculations. This soil carbon stock used in this was obtained from results of carbon stock estimation which had been previously conducted.

For each source of GHG emissions and fixation there are different approaches in determining its value. All forms of gas emitted were converted into CO₂e value based on the conversion factors of N₂O and CH₄ produced by IPCC (2007).

¹ Chase L.D.C., Henson I.E., Abdul-Manan A.F.N., Agus F., Bessou C., Milà i Canals L., and Sharma M. (2012) *The PalmGHG Calculator: The RSPO greenhouse gas calculator for oil palm products, Beta-version*. The Roundtable for Sustainable Palm Oil – RSPO. Kuala Lumpur, Malaysia

2.6 LAND USE CHANGE ANALYSIS (LUCA) ASSESSMENT

2.6.1 Dates and Duration of Assessment

The assessment were conducted from April 2015 to June 2015 (approximately 6 days), comprising three stages, namely (i) Data Review and Assessment (Bogor and Jakarta), (ii) Field Verification (PT KPAM's permitted area and its surroundings), and (iii) analysis and preparation of reports (Bogor and Jakarta). Further update study of the land use change analyses (From December 2017 to January 2018) was carried out to determine if there is any changes on land use from October 2015 to December 2017, and verified using Lidar Data.

2.6.2 Background of the Assessors

Table 10: LUCA Assessors with their expertise

No	Name	Role	Credentials
1	Risa Desiana Syarif	Specialist in HCV 5 & 6	Forestry, Community Forestry, GIS, Remote Sensing, Land Use CHANGE Analysis, Carbon Stock Estimation
2	Ryan Karida Pratama	High Carbon Stock and Land Suitability Surveyor	GIS, remote sensing, land use change analysis, carbon stock estimation, Land Suitability for Palm Oil Plantation
3	Sr. Nosius Luaran	Land use Mapping using Remote Sensing and GIS	GIS, remote sensing, land use change analysis

2.6.3 Methodology of the Land Use Change Analysis

The study was conducted using a combination of (i) remote sensing and spatial methods analysis, (ii) ground verification, (iii) in-depth interviews (iv) review of relevant documentation. The process and the detailed activities that is involved in the land use change assessment, can be referred as such presented in the RSPO Remediation and Compensation Procedure (RSPO, May 2014, page 27).

There are two stages of assessment activity, as stated in the following;

Scope of assessment: LUC Analysis conducted in the permitted area of PT. KPAM located in Ketapang Regency, West Kalimantan Province. The analysis was conducted in several different time scale, which includes (i) November, 2005; (ii) November 2007;,(iii) January 2010; and (iv) May 2014.

Data that is used for Assessment: Land Use Changes Analysis was conducted by using satellite images from multiple dates of acquisition. Ideally the satellite images should be acquired for the cut-off dates (early November 2005 to the end of 2007, beginning in January 2010 to the end of February 2015). However, satellite images for the land cover analysis do not always correspond with the relevant time periods because of the good quality imagery was not be available (e.g. covered by clouds) during the assessment period. The satellite

images that were used in the LUCA include (i) Landsat 5 TM with spatial resolution of 30 m, (ii) Landsat 7 ETM + with a spatial resolution of 30m, and (iii) Landsat 8 OLI with a resolution of 30m. In addition to the spatial data in form of satellite imagery, the analysis of land use change also include additional field data that is gathered from PT. KPAM especially data on (i) land clearing, and (ii) legality data on the operational areas.

Final land use changes was assessed, based on the available date that we have gather from Lidar, taken during the period of June – Dec 2017.

A summary of data used in the analysis is presented in the table 11 in the following.

Table 11: Data used for KPAM LUC analysis.

Main Data	Detail of Data	Source of Data	Details
Citra Satellite period cut-off November 2005	Citra satellite Landsat 5 TM path/row 117/62 akuisisi 8 October 2005	www.glovis.usgs.gov	Land closure condition during the cut-off from November 2005 to November 2007 and before the land clearing. This image (dated Oct 2005) was used for LUCA assessment (2005)
Citra Satellite period cut-off November 2007	Citra satellite Landsat 5 TM path/row 117/62 akuisisi 25 September 2007	www.glovis.usgs.gov	To see the condition of land cover during cut-off November 2007 - December 2009
Citra Satellite period cut-off January 2010	Citra satellite Landsat 5 TM path/row 117/62 akuisisi 25 Maret 2009 Citra satellite Landsat 5 TM path/row 117/62 akuisisi 7 November 2010	www.glovis.usgs.gov	To view land cover conditions at the time of cut-off January 2010 - RSPO Membership IOI Group (February 2012) This image (dated Maret 2009) was used for LUCA assessment (2009)
Citra Satellite period cut-off May 2014	Citra satellite Landsat 7ETM+path/row 117/62 akuisisi 13 July 2012 Citra satellite Landsat 8 OLI TM path/row 117/62 akuisisi 18 January 2014	www.glovis.usgs.gov	To view the land cover conditions at the cut-off in 2014 - an HCV study was conducted (April 2015)
Citra satellite actual (April 2015)	Citra satellite Landsat 8 OLI TM path/row 117/62 akuisisi 26 Maret 2015 Citra satellite Landsat 8 OLI TM path/row 117/62 akuisisi 22 February 2015	www.glovis.usgs.gov	To view the current land cover conditions and design a ground check plan This image (dated Maret 2015) was used for LUCA assessment (2015)
Lidar data (June – dec 2017)	Data Raster with 0.5 meter resolution	Delta	Covering the whole area of the PT. KPAM area. This image (June 2017) was used for LUCA assessment (2017)
Data vector batas-batas administrasi dan toponimi	Data Vektor RBI Skala 1:50.000 Kabupaten Palalawan	Badan Informasi Geospasial, Cibinong	Used as data mapping support data
	Data PODES 2010	Badan Pusat Statistik	
Boundaries Data Area	Data vector <i>Areal Rencana Izin Lokasi</i>	PT KPAM	Used as the boundary of the study area

Main Data	Detail of Data	Source of Data	Details
Data model Elevation	Data Digital Elevation Model SRTM 90 m.	http://www2.jpl.nasa.gov/srtm/cbanddataproducts.html/	Used to analyze altitude and create hill shade effects on the created maps.
	Data Digital Elevation Model ASTERGDEM 30 m.	http://gdem.ersdac.jp/acesystems.or.jp/	

- **Stages and process of analysis** – involve the process that is presented in the flowchart on Analysis of Land Cover using remote sensing and verification procedure listed on RSPO remediation and compensation dated May 2014 (page 27).
- **Satellite imagery acquisition** – involve the downloading process and acquisition of the requested satellite imagery.
- **Satellite image pre-processing** – involve the imagery rectification, resolution calibration, and histogram equalization. The Root Mean Square Error (RMSE) value allowed in this process was 0.05.
- **Image Classification** – involve the land cover classification using the supervised classification and followed with visual correction or visual interpretation. Classification used ERDAS image 9.1 software and ArcGIS v.10.1.
- **Field Verification** – Ground truthing for field verification work in the field. Number of ground truthing sample is about 167 points and the minimum number of sample points allowed is 51 points. Field verification focuses on the land use or land cover changes based on the original land cover (mapped in November 2005), compared to the current land use/land cover in the area of the PT. KPAM permit location. A total of 110 points were sampled (Refer to Figure 7).

- **In-depth Interview** – baseline information with regards to land cover was gathered from key informants such as: land owners, villagers from enclave areas, people involved in land clearing/illegal logging, as well as surrounding communities. Secondary information was always subject to verification and validation through a triangulation process, i.e. counter-checking with other sources including official references.
- **Document review** – documents reviewed were carried out to gather additional key information, in order to understand the pattern of the land changes. Documents that are reviewed, include handover document of land compensation (if it has been done, usually found in old plantation, land clearing payment document, progress document of LC, LC SOP, and environmental document (ANDAL, UKL/UPL)).

3. SUMMARY OF FINDINGS

3.1 SOCIAL IMPACT ASSESSMENT

3.1.1 Socio-economic impacts to country, region and local communities.

The Social Impact Assessment document reported that the economic structure of Ketapang District in 2013 is dominated by four economic sectors, which is (i) agricultural, (ii) trade-hotel-restaurant, (iii) mining industry. Development of oil palm plantation such as PT. KPAM, will contribute to the economy of the country and specifically to the district which in turn will increase the contribution of the agricultural sector towards economic growth.

During the development of the plantation, the document identified 3 (three) potential positive impacts and 2 (two) potential negative impacts for the local communities. Potential positive impacts include:

- (i) Creation of job opportunities and business opportunities (financial capital);
- (ii) Improvement of accessibility through development of road & infrastructure (physical capital);
- (c) Increase in community income from smallholder partnership agreement (financial capital).

Potential negative impacts include

- (i) Decrease in the total area of land that can be managed or utilized by the community; and
- (ii) Degradation of the water quality in the adjacent swamps and rivers (especially within the Berais River. This will indirect affect the source of income for the nearby community who is depended on the fisheries as source of living (natural capital).

Other potential risks and conflicts that may occurred during the development of the oil palm plantation in KPAM include;

- (i) Sporadic land fire within the PT. KPAM area (which is due to illegal hunting activity)
- (ii) Land disputes or claims by the local communities due to uncertainty of the land utilization boundary;
- (iii) Long engagement process during the establishment of partnership agreement between community and PT KPAM, due to inconsistent payment scheme.

3.1.2 Socio-economic Impacts in Respect of Emergent Communities (Workers, Suppliers etc)

The minimum wage at the district level in Ketapang is about IDR 1.5 million per month. Recently, the government has decided that for the agricultural sector, the company shall provide the minimum wage of IDR 1.578 million per month to the workers. The company had also stated that the process of recruitment of the workers, all local villages, who ha agreed to release their land to the company (through compensation) will be given priority to become workers of PT KPAM.

The potential impact identified also includes the increase of potential income for suppliers especially those that will have partnership and sub-contract agreements with the company. About 20% of the land area that is released by each of the villages, for palm oil plantation development purposes, will be designated as smallholder scheme programme.

3.1.3 Issues raised by stakeholders and assessor's comments

Based on the interviews and discussions with the specific group of communities, several issues are raised as follows:

- a. Community of Desa Danau Buntar considered that PT. KPAM had not shown any interest in developing the palm oil plantation, in partnership with local villagers due to the distance of PT. KPAM from the village. Nursery establishment also not flexible due to the road condition.
- b. Increase of river pollution due to the oil palm effluence that is release from the mills
- c. land compensation process and area designated for scheme smallholder, should be managed transparently (if any).

Based on the issues and findings of the social impact assessment, the assessors recommended several points as follows:

- a. Develop a specific policy direction and strategy for social engagement and management as basis for all the social activities implemented by the company
- b. Develop a social development and management plan, highlighting the potential social impacts (including priority social issues), with proper management measures.
- c. Formulate a transparent land compensation scheme (if any) and a partnership scheme with the nearby or relevant local communities, which follow the FPIC process in land compensation/acquisition (if any).
- d. Facilitate the establishment of relevant cooperatives that can help to enhance the capacity building of the local communities.
- e. Develop an effective communication strategy for all stakeholders. This could be developed through the formation of outreach programme or platform that can enhance the interaction between the stakeholders and communities.
- f. Ensure that any land development of clearing activities during the development of oil palm plantation in KPAM, will not affect the swamps ecosystem and the Berais river network (which caused by water pollution and sedimentation).

3.2 ENVIRONMENTAL IMPACT ASSESSMENT

Based on the Environment Impact Assessment documents, the following list of impacts are expected, and the impacts could be categorized into three components as follows: s:

1. Physical and Chemical Environment Impact
 - a. Decrease in ambient air quality;
 - b. Increase in noise level;
 - c. Decrease in water surface quality
 - d. Land subsidence
 - e. Physiographical changes
 - f. Changes in drainage pattern
 - g. Risk of land fire
2. Biological Impact
 - a. Decrease in flora diversity
 - b. Decrease in fauna diversity
 - c. Water biota species diversity

3. Social, Economy and Community Health Impact
 - a. Increase in economic activity
 - b. Increase in community income
 - c. Changes in community behavioral pattern
 - d. Social conflict
 - e. Decrease in community health level

Table 12: List of Regulatory Documents, Permits and Property Deeds.

No	List of Document	Certificate Letter	Agency	Area (Ha)	Remark
1	Information on PT.KPAM Location	525/0841.Bappeda-D Tanggal : 2/08/ 2007	Regent Ketapang	20,000	
2	Location Permit	365 Tahun 2007 Tanggal : 24/09/2007	Regent Ketapang	20,000	
3	Plantation Business Permit	216 Tahun 2009 25/05/09	Regent Ketapang	20,000	
4	Extension of Location Permit	416 Tahun 2010 Tanggal : 27/07/2010	Regent Ketapang	20,000	
5	AMDAL	742 / KLH - B / 2015 Tanggal : 3/11/2015	Gubernur KALBAR	11,000	
6	Letter of Recommendation Permit	100/1193/PEM Tanggal : 26/06/ 2015	Regent Ketapang	11,000	
7	New Plantation Business Permit in 2015	772 / DISBUN - D / 2015 Tanggal : 27/11/2015	Regent Ketapang	11,000	
8	Letter of Recommendation Permit	100 / 5112 / PEM 26/06/2016	Regent Ketapang	11,000	
9	Approval of ANDAL Framework	12/2015 Date: 28/08/2015	West Kalimantan Governor	11, 000	
9	Timber Stands Permit	81/Dishut-II/Ppk/2016 Tanggal : 9/02/2016	DISHUT PROV	11,000	
10	Land Clearing Permit	525/403/Disbun - D/2016 05/04/16	Disbun Ketapang	5,000	
11	Heavy Machinery Permit	52/259/DISBUN - D/2016 02/03/2016	Disbun Ketapang	11,000	
12	Socialization on PT KPAM Vision and Mission	Tim TP3 K dan Satgas, PT KPAM 20/06/2015	TP3K Ketapang & PT KPAM		In Progress

13	Extension of Location Permit	1507 / DPMPSTSP - D / 2017 18/12/2017	Capital Investment & Integrated Services	11,000 and Mill Capacity 6 ton TBS/hour	
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Table 13: List of Stakeholders Consultation

Date and location	Name, Title and representative role and approach	Key of concern/ recommendations of stakeholder	Team response
27 April 2015 (Danau Buntar Village)	Ali (±60 year), the public figures of Danau Buntar Village (Public consultation)	<ul style="list-style-type: none"> ▪ Provided information on villages located at '<i>natai</i>' which encircled the swamps, where the community didn't have skill in managing the swamps area ▪ Asked PT KPAM to clear the location permit ("IL") position in the villages", i.e. Danau Buntar, Sukaramai, and Jambi Village, surroundings. Reason being was that the border and boundaries of villages involved in the IL were not yet clear and were not known by the community. ▪ Proposed to the company for the involvement of the communities in marking the boundaries of Danau Buntar, Jambi, Sukaramai, and Natai Kuini Villages ▪ Before having a discussion on Plasma, it would be better to finalize the border. Each village would know how large the Plasma each village would manage 	The consultation is purposed to knowing the community responses and gathering the information of the areas that have high conservation value within the IUPs area. One of information need is the location of presence, particularly in relates with the village. This important information is need to manage the HCV area by collaborated and community participatory. Therefore, Therefore the team will recommending the company for village border. The team will also remembering the KPAM and the community that the company didn't have authority in designated the village border. The PT KPAM is only help and facilitate it.
27 April 2015 (Danau Buntar Village)	Abon (±50 years), head of village consultative body ("BPD") Danau Buntar Village (Public consultation)	<ul style="list-style-type: none"> ▪ Gave information on the fact that there was no sacred tomb or area within the ILs of PT KPAM. The community made and focused such sacred tomb or site at the same location, which was far from the ILs area. ▪ In principle, villagers of Danau Buntar consented and hoped that the company could quickly operate such ILs. The quicker the company operate the sooner would the company help develop the community, either economically or environmentally. 	Identification of conservation area and designation of such area to become restricted and forbidden area for plantation to clearance it, are the stage must be followed before starting the sustainable oil palm plantation. Input, suggestion and information of the community on conservation area within the ILs of PT KPAM are the most interested to soon after plantation be operated.
27 April 2015 (Danau Buntar Village)	Gono (±45 years), a figures of Tebing Tinggi – Danau Buntar. Village (Public consultation)	Gave information on conflicts between the community and PT UAI (Sampoerna Agro) regarding Plasma area. In regard to that problem, villagers of Danau Buntar hoped that the company would socialize Plasma area plan to them.	The plasma area of oil palm plantation is commonly occurred and be a conflict source between the company and the community, even in the community self. Therefore, the team hope that the PT KPAM is conducting FPIC and SIA shortly and be prioritized the dialogue in each constrain between the company and the community.

Date and location	Name, Title and representative role and approach	Key of concern/ recommendations of stakeholder	Team response
27 April 2015 (Danau Buntar Village)	Idar (±40 years), a people of Sukaramai and Edi (±43 years), people of TebingTinggi – Danau Buntar Village (Public consultation)	Brais River was one of the rivers used to fulfill the communities" daily subsistence. However, Brais River was not only used by villagers of Danau Butar for daily subsistence, but was also used by villagers of Sukamara of Kalimantan Tengah Province.	It is also similar with the team finding. This finding would be considered in HCV 5 designation or it related with such important area for daily subsistence. Nevertheless, the team will reconfirming the important of Brais River and riverbanks protection in accordance with government regulation and scientific terms.
27 April 2015 (Danau Buntar Village)	Adul (±37 years), people of Tebing Tinggi – Danau Buntar Village	Gave information on the frequently occurring land fire in ILs of PT KPAM, particularly during dry season when the vegetation became dry.	The regular fire within the ILs area is important part in indentifying processes of HCV area and management strategy. It is one of basis in HCV area designation and management.
27 April 2015 (Danau Buntar Village)	Dani (±49 years) Head of Kampong Tebing Tinggi – Danau Buntar.Village (Public consultation)	Gave information the abundance of Orangutan in the past, when even one of the Tebing Tinggi Kampong villager would carry the Orangutan when it was a baby well into its adult age. Currently, there are Orangutan nests in around the riparian forest of Jelai River. However, Orangutan were rarely found at the Brais River until to the Danau Buntar Village. Therefore, he proposed that the planting area in Tebing Tinggi village be maximized.	The information is useful in indentifying processes of Biodiversity HCV.The team is also confirming the finding of the Orangutan nests at such area before stakeholder consultation.Beside, the team is also informing the important of Orangutan conservation and its habitat, either national or international, including of global issue and the risk for the company and the community if there is disturbance to such Orangutan and its value.
27 April 2015 (Danau Buntar Village)	Hendi (±40 years), Head of Village Danau Buntar (Public consultation)	The community agreed and supported the company when it would operate within its ILs. The community also hoped that the company would quickly build road and thus generate local economy.	Input, suggestion and information of the community on conservation area within the ILs of PT KPAM are needed, thus the plantation can shortly be operated. About the community wishes are well hear by the company who attend the consultation as a supervisor.
18 March 2016 (Jambi Village – Manismata Subdistric)	Rudi (±40 tahun), Head of Village Jambi, Ahmad Yani ((±45 tahun) member BPD, and Inyo (±55 tahun) public figure. (FGD)	<ul style="list-style-type: none"> ▪ The area that became Jambi was the home range of Dayaktribes along the Jelai River. ▪ The presence of oil palm plantations such as PT HSL and PT UAI was felt to have a positive impact on the community"s employment opportunities ▪ For Dayak ethnic people whom were still embracing Kaharingan Religion, they would perform some rituals associated with traditional traditions such as new land / garden events, begendang, gifts, birth 	This information is important as a consideration for determining the presence of HCV5 and HCV6. In addition, the management of land fire threats to the existence of conservation areas.

Date and location	Name, Title and representative role and approach	Key of concern/ recommendations of stakeholder	Team response
		<p>ceremonies, marriages, and deaths. However, for customary activities that would require high costs, they were infrequently held.</p> <ul style="list-style-type: none"> ▪ Frequent fires within the concession area of PTKPAM 	
<p>19 March 2016 (Sukaramai Village- Manismata Subdistric)</p>	<p>Karmawan (±41 years), Head of Village Sukaramai – Manismata Subdistrict (FGD)</p>	<p>Gave information on the villagers' profession as fishermen, carpenter, construction workers or employee at PT Harapan Sawit Lestari and PT Usaha Agro Indonesia/ the Samporrna Group). Through their skills from HPH, many of people had succeeded in such condition. Some of them were recruited as an employee of oil palm plantation and some of them had developed business opportunity in informal field.</p>	<p>The information is essential to designating the HCV 5 presence in relate with the socio economic and the community</p>

Date and location	Name, Title and representative role and approach	Key of concern/ recommendations of stakeholder	Team response
15 March 2015 and 1 August 2016 (di Institut Pertanian Bogor dan via Whatsapp)	Dr. Ir. Basuki Winata, M.Sc (Peat expert, Bogor Agricultural University) (interview)	<ul style="list-style-type: none"> ▪ Provided materials on peatland and how to survey (March 15, 2015) ▪ The key to managing peatlands is water management, (ii) Monitoring should be done continuously, especially peatland humidit. The easiest way is to monitor water levels and rainfall ▪ Non-forested peat should receive more attention because of high risk of land fires ▪ Forested peatlands were appropriate for conservation areas, whereas non-forested areas should be restored. The quickest restoration would be to use a technical civilian approach, so that the risk of fire could be avoided ▪ decomposed peatlands is slow due to, a) peat water is quite thick and the day comes from rain water, poor nutrients so that the bacteria decay is less active, b) peat water that is caged thousands of years rich in acidic acid which is disinfectant also, c) Litter properties from plants in other peatlands with litter from swamps. The litters in the peat were more difficult to decompose. When the peat sustain life in poor nutrients, then the leaves would be faster and more decimated than the leaves in peat swamps of non-peat / thin peat. 	Opinions and suggestions will be an important part of peatland surveys and management of HCV and HCV MA at the peatland
1 March 2016	Juanisa; Manager IAR & Zulfahmi, IAR Ketapang (by email, together with HCV assesor of PT UAI)	The results of the 2014 survey on the potential orangutan conflict in kendawangan sub-district were found to occur only in Kedondong Village and Pangkalan Batu Village. In both villages the condition of the forest had been opened and turned into a good company of palm, rubber and logging. While in Manismatta sub-district, IAR had never conducted a survey in Manis Mata sub-district.	In addition to information and material considerations for the existence of HCV1

<p>1 March 2016 (Jakarta)</p>	<p>Iwan Setiwan Assesor HCV PT UAI (Interview)</p>	<ul style="list-style-type: none"> ▪ Provided suggestions for improving the presentation of HCV report ▪ Provided information on peatland in PT UAI area adjacent to PT KPAM had land cover in the form of ferns and shrubs ▪ Fires not only occurred in natural areas of PT KPAM, but also In UAI ▪ PT KPAM would receive the impact of land clearing in the upper part of the Brais river that was part of PT UAI concession ▪ There should be better coordination between PT UAI and PT KPAM in managing HCV 	<p>Suggestions will be considered to improve the report. Immediately will encourage PT KPAM to be able to coordinate with PT UAI in managing HCV area.</p>
<p>20 March 2016 1 April 2016 (BKSDA office, Ketapang)</p>	<p>BKSDA, diwakili oleh Ir. Sustyo Iriyono, MS (Ka BKSDA Kalimantan Barat) (Interview)</p>	<p>Established the synergy of all stakeholders, especially in the context of conservation of protected wild plants and wildlife and forest and land fires in PT KPAM concession areas and surrounding areas.</p>	<p>Cooperation with all stakeholders should be supervised. It is recommended that BKSDA supervise the management of HCV areas within the landscape context of PT KPAM and its surrounding areas, including PT BMJ and PT UAI. The results of this consultation are further set in the memorandum of a cooperation agreement between BKSDA and PT KPAM</p>
<p>16 October 2016 (Jakarta)</p>	<p>Ninil Jannah (Assesor HCV PT BMJ) (Direct Interview)</p>	<ul style="list-style-type: none"> ▪ Landscape approach in HCV study. ▪ PT BMJ and PT KPAM were in one landscape ▪ PT KPAM area is located downstream of PT BMJ through Brais river, so it will become an area affected by PT BMJ operations ▪ Synergy of HCV area management between PT BMJ and PT KPAM, Especially areas of interconnected peatland forest fragments and Brais river ▪ Needed to create conservation memorandum of understanding (MOU) on conservation areas together with resource users in the region (PT UAI, PT BMJ, and PT KPAM), government (BKSDA), and local community. This MOU would be the foundation for each party in managing its conservation area. 	<p>The team approved the landscape approach in HCV assessment in the region. The team will encourage the management of PT KPAM to immediately coordinate with PT BMJ and PT UAI related to the management of HCV in this area.</p>

<p>6 December 2016</p>	<p>Mike Senior Mike@proforest.net Surin Suksuwan Surin@proforest.net (by Email dan Skype)</p>	<ul style="list-style-type: none"> ▪ Detail information on the forest as HCV3, including its inclusion in the land cover description ▪ The Brais River flooding area as HCV4MA ▪ Did a Brais river flood review ▪ Reviewing other wetlands and mapping the wetlands ▪ Considered Brais river as HCV5 ▪ Reviewed HCV6, thus not only dependent on information in public consultations. 	<p>Most of the inputs and suggestion are an improvement to the HCV report</p>
<p>20 February 2017 (office Aksenta, Jakarta)</p>	<p>Darmawan (Flora Fauna Indonesia) (Interview)</p>	<ul style="list-style-type: none"> ▪ FFI has limited information about the distribution of orangutans in the location of PT KPAM and its surroundings. In those areas, FFI was not taken as an intensive ▪ Suggested that the management of HCV areas be integrated with other conservation schemes such as HCS and peatlands. 	<p>In addition to information as a consideration for the existence of HCV1</p>

3.3 HCV ASSESSMENT

The coverage of the HCV assessment, is not only cover the area of IUP PT. KPAM (11,001 ha) but also covering additional area with a size of 3,573 ha. This area includes peat land moratorium area (western side), Belida Lake, the production forest (northern side), the development plan area (KSCT) of Manismata Subdistrict and the riparian buffer of Jelai river and Brais river. In total, the HCV assessment was carried out in an area of 14,574 ha.

The HCV assessment was carried out in two stages where (i) The first field survey was conducted in April/May 2015, covering the bigger areas with a total area of 14,574 ha; The second field survey was conducted in March to April 2016, covers the IUP area (11,001 hectares). The area consists of two polygons and separated by the Brais River and a 100-meter width de riparian area on the left and right side.

Administratively, the IUP is located in Danau Buntar village, Kendawangan Subdistrict and Sukaramai village, Manismata Subdistrict of Ketapang District, West Kalimantan Province, Indonesia. The area is located at N - 111^o055'20" E – 111^o07'00" E and 2^o42'20" S - 2^o49'00" S. The boundary area of PT. KPAM is bordered with: (i) the development area of the Danau Buntar village, PT UAI palm oil plantation, production forest (HP), and the development plan area of Manismata Subdistrict (KSCT) in the north; (ii) the riparian buffer of Jelai River, production forest, and the moratorium peat land area in the south; the moratorium peat land area and PT BSS in the west; (iv) the riparian buffer of Jelai River, which is also the border between Kalimantan Barat and Kalimantan Tengah, in the east.

Based on field observation and assessment, there were only 5 (five) identified HCV categories, i.e. HCV 1, HCV 3, HCV 4, HCV 5, and HCV6. HCV 2 is not found in the project area. Table 14 shows the HCV identification summary in PT. KPAM area.

Table 14: HCV Identification Summary in PT KPAM area

HCV Type	Definition and Description of quality as HCV	Present	Potencial	Absent
HCV 1	Concentration of biological diversity, including of Endemic; Rare Threatened Endangered (RTE) that significant at global, regional or national			
	▪ high overall species richness, diversity or uniqueness within a defined area when compared with other sites within the same biogeographic area.			V
	▪ Populations of multiple endemic or RTE species.	V		
	▪ Important populations or a great abundance of individual endemic or RTE species, representing a substantial proportion of the regional, national or global population which are needed to maintain viable populations	V		
	▪ Small populations of individual endemic or RTE species, in cases where the national, regional or global survival of that species is critically dependent on the area in question	V		
	▪ Sites with significant RTE species richness, or populations (including temporary concentrations) of priority species approaching those of key protected areas or other priority sites (e.g. KBAs) within the same biogeographic boundary.			-V
	▪ Particularly important genetic variants, subspecies or varieties.	-		V
HCV 2	Large landscape-level ecosystems and ecosystem mosaics that are significant at global, regional or national levels, and that contain viable populations of the great majority of the naturally occurring species in natural patterns of distribution and abundance.			
	▪ Large areas that are relatively far from human settlement, roads or other access. Especially if they are among the largest such areas in a particular country or region.			V
	▪ Smaller areas that provide key landscape functions such as connectivity and buffering			V
	▪ Large areas that are more natural and intact than most other such areas and which provide habitats of top predators or species with large range requirements.			V
HCV 3	Rare, threatened, or endangered ecosystems, habitats or refugia.			
	▪ Naturally rare because they depend on highly localised soil types, locations, hydrology or other climatic or physical features	V		
	▪ Anthropogenically rare	V		
	▪ Threatened or endangered due to current or proposed operations.	V		
	▪ Classified as threatened in national or international systems	V		
HCV 4	Basic ecosystem services in critical situations, including protection of water catchments and control of erosion of vulnerable soils and slopes			
	▪ Managing extreme flow events, including vegetated riparian buffer zones or intact floodplains	V		
	▪ Maintaining downstream flow regimes	V		
	▪ Maintaining water quality characteristics	V		
	▪ Fire prevention and protection	V		
	▪ Protection of vulnerable soils, aquifers and fisheries	V		
	▪ Provision of clean water			V
	▪ Protection against winds, and the regulation of humidity, rainfall and other climatic elements.			V
	▪ Pollination services	V		

HCV 5	Sites and resources fundamental for satisfying the basic need of local communities or indigenous peoples (for livelihoods, health, nutrition, water, etc...), identified through engagement with these communities or indigenous peoples.			
	▪ Hunting and trapping grounds (for game, skin and furs)			V
	▪ NTFPs such as nuts, berries, mushrooms medicinal plants, rattan			V
	▪ Fuel for household cooking, lighting and heating			V
	▪ Fish (as essential sources of proteins) and other freshwater species relied on by local communities	V		
	▪ Building materials (poles, thatching, timber)			V
	▪ Fodder for livestock and seasonal grazing			V
	▪ Water sources necessary for drinking water and sanitation			V
HCV 6	▪ Items which are bartered in exchange for other essential goods, or sold for cash which is then used to buy essentials including medicine or clothes, or to pay for school fees			V
	Sites, resources, habitats and landscapes of global or national cultural, archaeological or historical significance, and/or of critical cultural, ecological, economic or religious/sacred importance for the traditional cultures of local communities or indigenous peoples, identified through engagement with these local communities or indigenous peoples			
	▪ Sites recognised as having high cultural value within national policy and legislation.			V
	▪ Sites with official designation by national government and/or an international agency like UNESCO.			V
	▪ Sites with recognised and important historical or cultural values, even if they remain unprotected by legislation.			V
	▪ Religious or sacred sites, burial grounds or sites at which traditional ceremonies take place that have importance to local or indigenous people.			V
▪ Plant or animal resources with totemic values or used in traditional ceremonies	V			

3.3.1 HCV 1: Species diversity

HCV1 is present in the PT. KPAM area and its surroundings. The project area has at least three criteria (out of six criteria that is stated in Brown *et al.*, 2013), namely

- (i) Populations of multiple endemic or RTE species;
- (ii) Important populations or a great abundance of individual endemic or RTE species, representing a substantial proportion of the regional, national or global population which are needed to maintain viable populations
- (iii) Small populations of individual endemic or RTE species, in cases where the national, regional or global survival of that species is critically dependent on the area in question.

(i) Populations of multiple endemic or RTE species

The following RTE species was found, and their status is based on the latest IUCN status, which is (i) orangutan (*Pongo pygmaeus* / CR), (ii) owa (*Hylobates albibarbis* / EN), (iii) bekantan (*Nasalis larvatus* / EN), and (iv) rusa (*Cervus unicolor*). Other RTE Species that are protected by government regulations includes (i) kijang (*Muntiacus muntjak*), (ii) pelanduk (*Tragulus javanicus*), and (iii) Napoh (*Tragulus napu*). The RTE bird species according to the IUCN are bangau tongtong (*Leptoptilos javanicus*); whereas, according to CITES and the Indonesian government are elang bondol (*Haliastur indus*), elang laut perut putih (*Haliaeetus leucogaster*), elang tikus (*Elanus caeruleus*), betet ekor panjang (*Psittacula longicauda*), kangkareng hitam (*Anthraceros malayanus*), kangkareng perut putih (*Anthraceros albirostris*), and several species of cranes and cangak. The RTE species of the herpetofauna taxa according to the IUCN are buaya sinyolong (*Tomistoma schlegelii*/VU), bidawang (*Orlitia borneensis*/VU), kura batok (*Coura*

amboinensis/VU), and labi-labi (*Amyda cartilaginea*/VU). Four species also have CITES conservation status, while those according to Indonesian laws and regulations are estuarine crocodiles (*Crocodilus porosus*). The existence of these species was found in the remaining fragmented peat swamp forests, riparian riverine forest along Jelai River, Belida lake, and other riparian areas along the small rivers located within the PT. KPAM area.

The RTE and endemic of plants species found in peat forest according to IUCN are perepat (*Combretocarpus rotundatus*/VU), pantung (*Dyera polyphylla*/VU), ramin (*Gonystylus bancanus*/VU), belangiran (*Shorea balangeran*/CR) and protected by government law is kantung semar periuk (*Nepenthes ampullaria*). In the heath forest, tree species that is found include resak (*Cotylelobium lanceolatum*/VU), belangiran (*Shorea balangeran*/CR) and kantung semar (*Nepenthes gracilis*). Tree species such as bedaru (*Cantleya corniculata*/VU), ulin (*Eusideroxylon zwageri*/VU) dan meranti putih (*Shorea bentongensis*/EN) was found in the riparian areas. Other locally protected species, kempas (*Koompassia malaccensis*) was also found along the edge of peat forest.

(ii) Important populations or a great abundance of individual endemic or RTE species, representing a substantial proportion of the regional, national or global population which are needed to maintain viable populations

Spatial and temporal species concentrations are present in the riparian of Brais river and Jelai River. The area is suitable habitat for a migratory birds, especially for breeding site. Several migratory birds encountered consist of species with global and regional distribution. According to IUCN (2017), several species of birds with global distribution encountered are (i) cangak abu (*Ardea cinerea*), (ii) cangak merah (*Ardea purpurea*), (iii) kuntul kecil (*Egretta garzetta*), (iv) kuntul kerbau (*Bubulcus ibis*), (v) dara laut (*Sterna hirundo*), (vi) dara laut jambul (*Thalasseus bergii*), and (vii) kapinis rumah (*Apus affinis*). Bird species that are present in a regional distribution include bangau tongtong (*Leptoptilos javanicus*) which spread from South India to Indonesia.

(iii) Small populations of individual endemic or RTE species, in cases where the national, regional or global survival of that species is critically dependent on the area in question.

The presence of animals that are classified under RTE species is found in the project area with small population, specifically in the remaining fragmented forest, i.e. (i) owa (*Hylobates albibarbis* / EN) population in the fragmented peat forest and the (ii) orangutans (*Pongo pygmaeus* / CR) in the fragmented riparian forest along Jelai River.

3.3.2 HCV2: Landscape-level ecosystems and mosaics

HCV2 was not found in the PT. KPAM area and its surrounding areas. PT. KPAM area with a size of 11,001 ha is relatively close to the residential areas, transportation access, and oil palm cultivation area. This area has been degraded due to forest fires, logging, excessive hunting, and land clearing, thus PT. KPAM has no longer contains a HVC no 2. According to the Intact Forest Landscape (IFL) maps (www.intactforests.org), PT KPAM's area is not included in the Intact Forest landscape network. PT. KPAM is actually isolated and not connected to any of the nearest IFL. However, within this project area, there remaining ecosystem include peat swamp forests, forests, and riparian forests.

3.3.3 HCV3: Ecosystems and habitats

HCV3 was found in the PT. KPAM area and its surroundings. All remaining forest in the PT. KPAM area is considered as HCV 3 area. Peat forest is naturally rare because it depends on hydrology and soil type features. Heath forest depends on soil type and riparian forest depends on hydrological features. All the remaining forest are also anthropogenically rare, which could be threatened by hunting, fishing and illegal burning activities. Land clearing for oil palm plantation development may also threatening the remaining forest areas. Peat forest ecosystems is protected by at least three (3) Acts, namely (i) Act No. 26/2007 on spatial land allocation, (ii) Act No. 32/2009 on Protection and Management of Living Environment and (iii) the Government Regulation No. 71/2014 on Protection and Management of Peat Ecosystem.

3.3.4 HCV4: Ecosystem services

HCV4 was found and recorded in the PT. KPAM area and its surrounding areas. All the rivers and riparian reserve (areas) provide an ecological function as a natural drainage (Brais river, Jelai River, Paduempat River, Brais Kapat River, and Tangguk River), so that upstream and downstream flow could be maintained naturally.

The presence of vegetation in riparian areas also functioning to maintain water quality characteristics, control erosion of river banks, hence provide protection for the fisheries. The wider rivers such as Brais River and Jelai River with larger dampened riparian have the function of a natural barrier that can prevent the expansion of land fires.

Peat forests and heath forests can mitigate the extreme water flows that would have caused flooding in the downstream area. Peat forest and riparian forest also play its function as a natural barrier that could prevent the expansion of land fires. The existence of pollination service was also determined by the presence of Kempas trees, where this trees are normally used as a nesting ground for pollinating bees. This tree can be normally found along the edge of the peat forest.

The ecosystem services such as provision of clean water, stabilizing steep slope, controlling erosion, protection against winds, and the regulation of humidity, rainfall and other climatic elements were deemed not present. The communities normally get their sources of clean water wells. Most of the area in PT. KPAM has a flat terrain, thus the risk of land erosion is not significant.

3.3.5 HCV5: Community needs

HCV5 was not found or present in the PT. KPAM's concession area. Based on the interviews with local communities, most of the HCV5 areas located outside of the concession area, which is located at the downstream. However, in order to ensure that the HCV5 that is located at the downstream area is not degraded or affected, the riparian area and floodplain area that is located at the upper stream along Brais River (located within the concession area) need to be maintained and protected.

Although the fishermen in the Brais River claim that there are other alternative livelihoods and Brais river is not the only place to harvest fish, but it is very important to make sure the ecosystem along the Brais River, could be conserved and protected, in order to ensure that the HCV5 area at the lower stream could be protected from any pollution. Therefore, Brais can be designated as part of the HCV5.

These areas have important values as a source of livelihood to meet people's basic needs.. The reasons for determining these important values are: (i) fishing in the Brais river will be the last option for the local community if they are unable to obtain other sources of income, (ii) other alternative livelihood such as carpentry or become labour to build construction, transportation services, farmers and plantation workers are not necessarily available at all times, and (iii) Currently, the Brais River is the main transportation route between Danau Buntar Village and Sukaramai town.

3.3.6 HCV6: Cultural values

HCV6 was found to be present in the concession area. Based on the participatory mapping, the local people of Danau Buntar, Sukaramai and Jambi Village claim that area which is important for their cultural and traditional practices within the PT KPAM area. However, within the concession area of PT KPAM, kangkareng bird habitat is present, especially in the peat forest. According to the Dayak tribe, this bird has a cultural and sacred values. For the Dayak community, kangkerang bird is a symbol of ideal leader and also a symbol of peace and unity.

Although the community nearby PT KPAM is dominated by Melayu tribe, but the existence of hornbills is important for the Dayak tribe on the regional level of the island of Borneo, as well as those outside the island of Borneo. Thus, it can be concluded that HCV6 is present within the PT KPAM area, especially the peat forest.

Other HCV6 values which is common includes young coconut leaves that is normally used to make "ketupat" during the muslim or islamic festival. Cemeteries is located in the Danau Buntar, Jambi and Sukaramai villages but this is outside the PT. KPAM concession area. Public consultation with the community was carried out using two approaches, i.e. (i) formal meetings and (ii) interviews. Formal meetings were conducted in each village.

The first public consultation was conducted in Danau Buntar Village on 27 April 2015 with 22 participants, attended by the Village Head of Danau Buntar, Chairman of BPD, Head of Dusun Tebing Tinggi, Kendawangan district representative, community leaders, Melayu indigenous leader, Babinkamtibmas (*Bintara pembinaan dan keamanan ketertiban masyarakat*), KPAM management, and Aksenta team.

The second public consultation was conducted in Jambi Village on 18 March 2016 with 11 participants, attended by the Head of Jambi village, Chairman and members of BPD and community leaders.

Third public consultation was conducted in Sukaramai village on 19 March 2016 with 8 participants, attended by Head of Sukaramai Village, Chairman and members of BPD, community leaders, and Aksenta Team.

Public consultation in Jambi and Sukaramai villages was carried out using the focus group discussion (FGD) method. Community consultations through face-to-face interviews were also conducted in the field, i.e. with fishermen in the Brais river, community leaders, villagers, and management of PT. KPAM.

The Aksenta team presented materials for discussion in the public consultations. These materials include: (i) understanding of HCV in the context of oil palm plantation development; (ii) the scope of HCV study in the PT. KPAM area; (iii) supporting maps for HCV studies in PT KPAM area; (iv) field data and information obtained during field survey, and (v) the interim results and HCV maps (drafts-1 for first public consultation and draft-2 for the second and third public consultation). On issues related to HCV in the area of PT KPAM, the community provided input and information about the Brais river, land fires, forest remnants, orangutans,

livelihoods, and employment. Some issues on community land allocation and village boundaries were also discussed. Land resource utilization issue is a common issue that is highlighted by the local community as this issue could effect their daily livelihood.

Stakeholder consultations were conducted during HCV assessment until the stage of finalizing the report. The consultation process includes face-to-face interview and communication through email and Skype. Key stakeholders such as NGOs (Proforest, IAR and FFI), academics/researchers (IPB), government (BKSDA), HCV assessors, and management of PT BMJ and PT UAI was involved during the finalization of the HVC report.

Figure 8a to 8e showing the area of HCV areas and Management Area (MA) (area that will be excised from the development of new plantation)

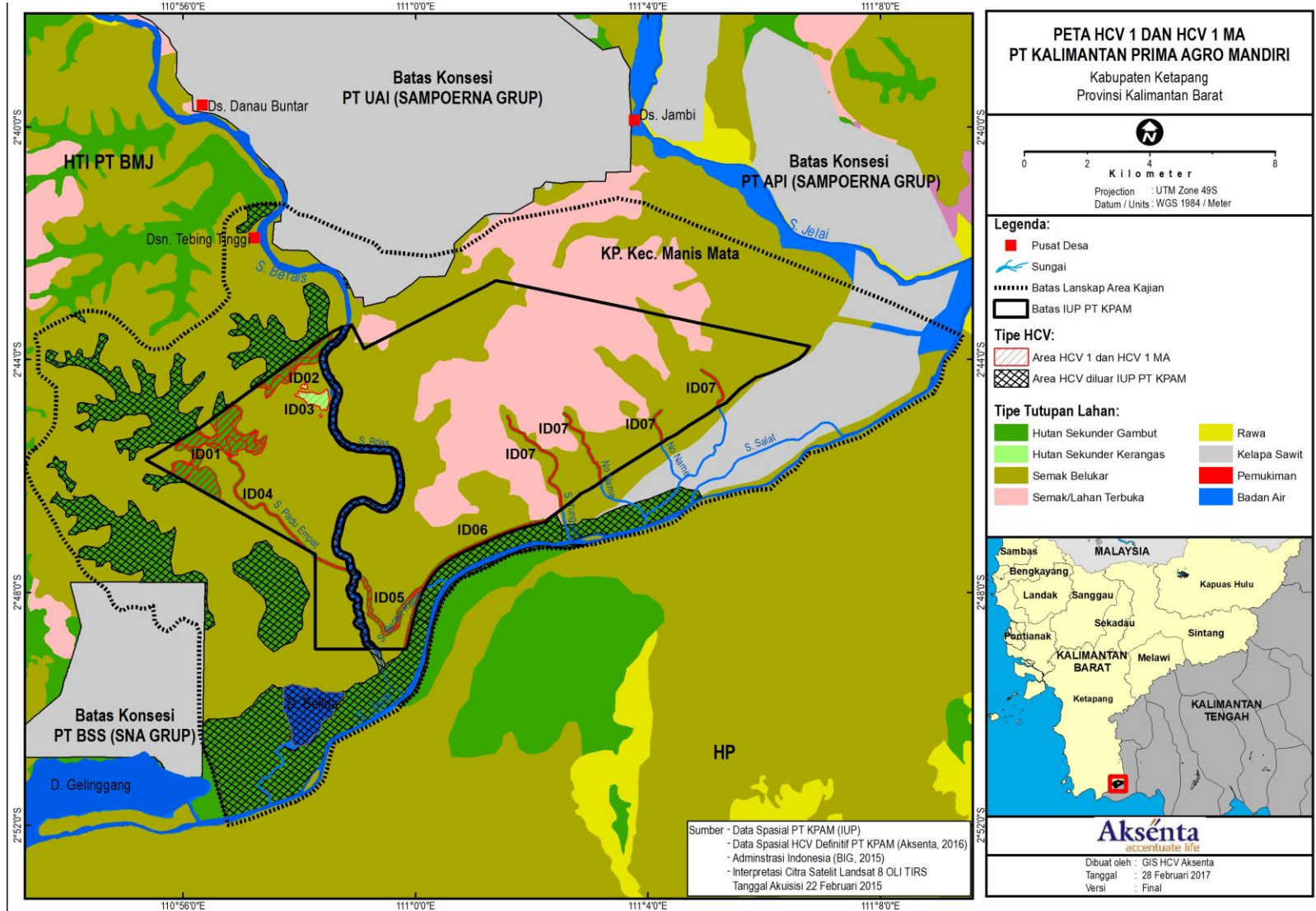


Figure 8a Map of the area of HCV 1 and Management Area (MA) (area that will be excised from the development of new plantation)

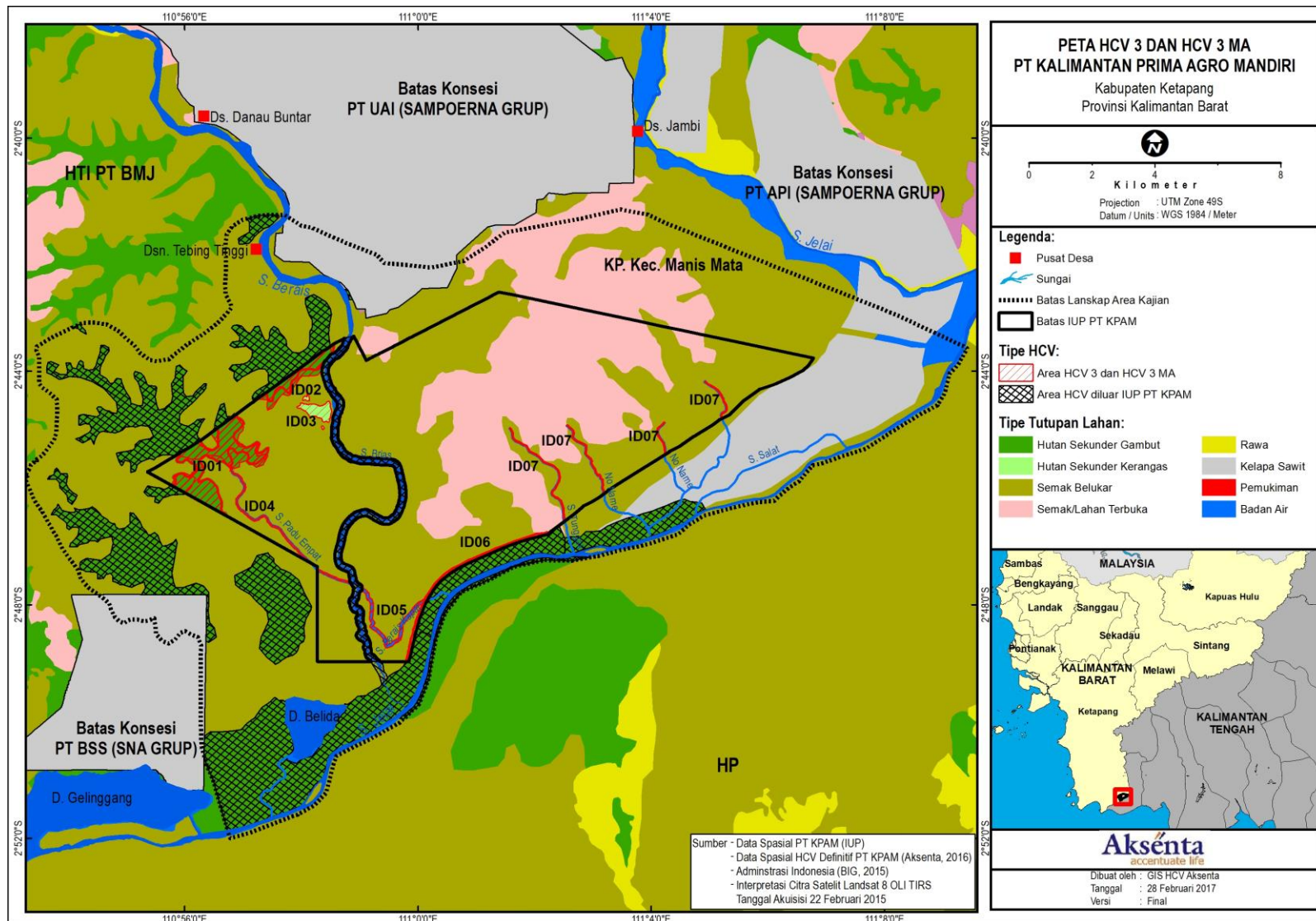


Figure 8b Map of the area of HCV 3 and Management Area (MA) (area that will be excised from the development of new plantation)

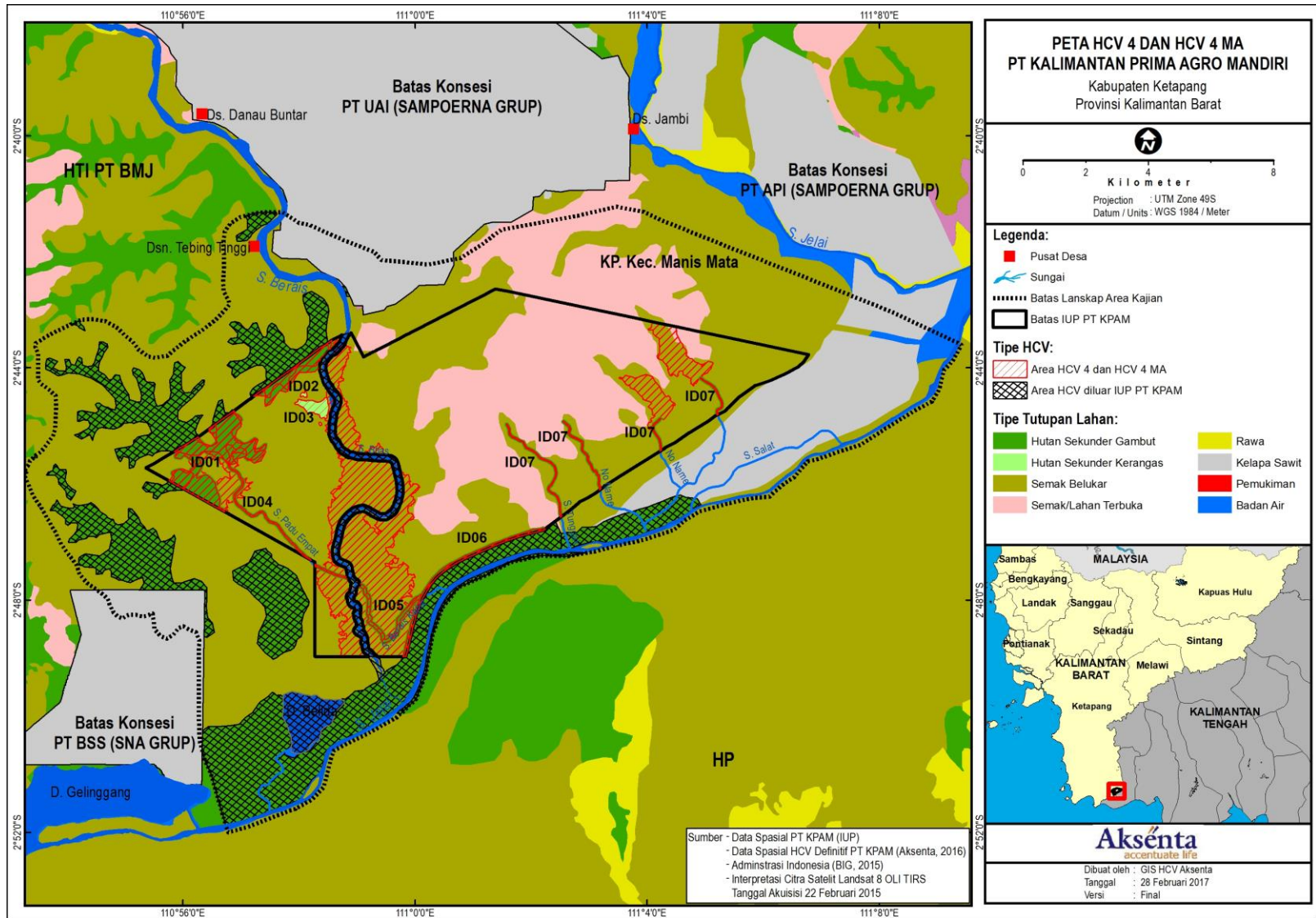


Figure 8c Map of the area of HCV 3 and Management Area (MA) (area that will be excised from the development of new plantation)

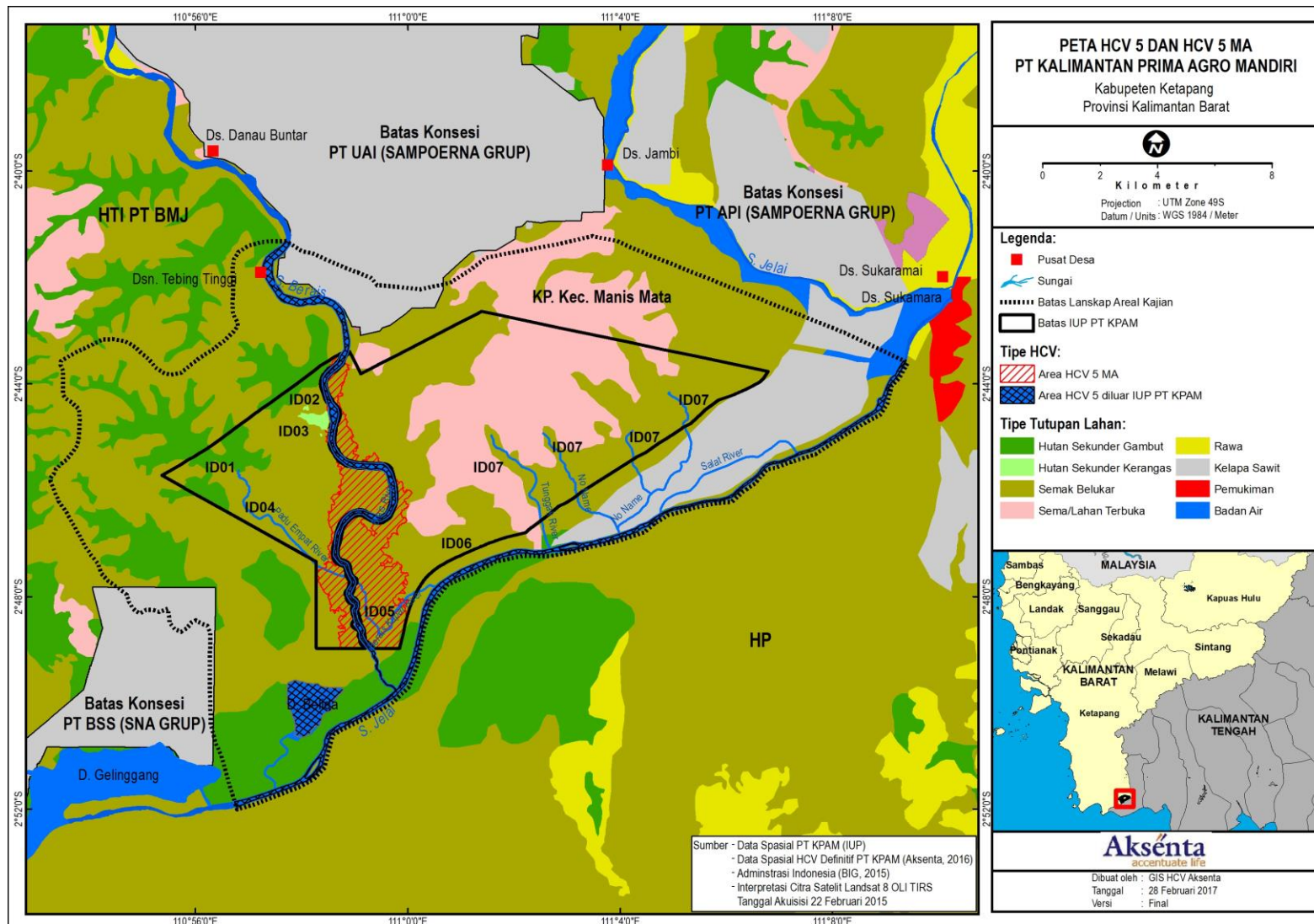


Figure 8d Map of the area of HCVMA 5 (area that will be excised from the development of new plantation)

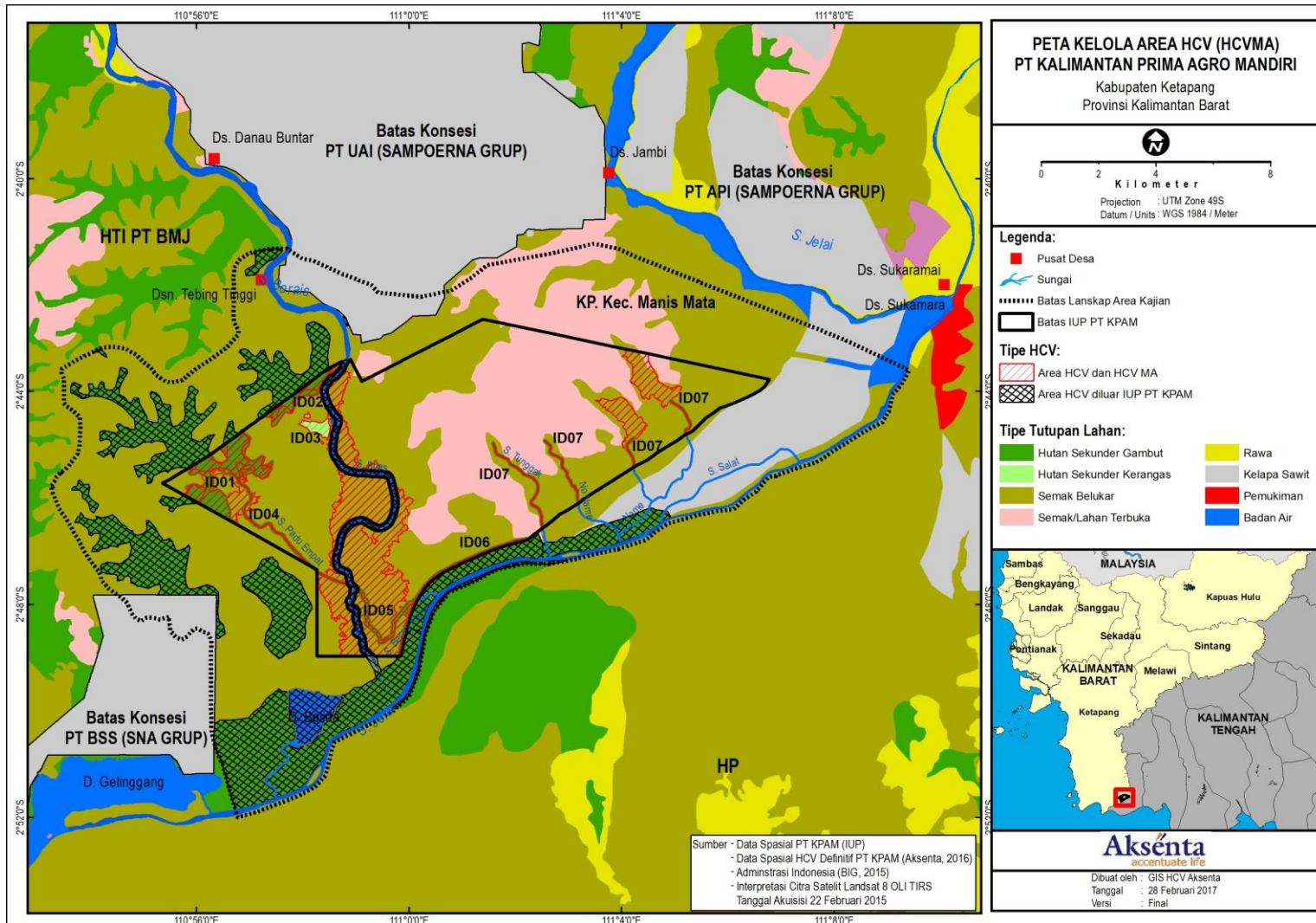


Figure 8e Map showing the area of HCV areas and Management Area (MA) (area that will be excised from the development of new plantation)

Table 15: HCV Hectarage area in PT KPAM

No	ID	Location	Location Description	HCV Type	Area (ha)
1	ID01	Peatswamp secondary forest	Peatswamp secondary forest within the IUP connected to the Moratorium area	1, 3, 4 and 6	265.39
2	ID02	Peatswamp secondary forest	Peatswamp secondary forest within the IUP PT KPAM connected to the production forest in the north	1, 3, 4 and 6	59.65
3	ID03	Heat (kerangas) forest	In the west of Brais River and southern part of Peatswamp secondary forest	1, 3 and 4	44.66
4	ID04	Paduempat River	<ul style="list-style-type: none"> River flows and width of riverbanks to be 50 meters on left and right, the river's width would be 3 m to 5 m Riparian river could still be restored naturally 	1, 3 and 4	29.73
5	ID05	Brais Kapat River and its riverbank	<ul style="list-style-type: none"> River flows and the width of riverbanks to be 50 meters on left and right, the river wide is 5-8 meters. Riparian river can still be restored naturally 	1, 3 and 4	38.10
6	ID06	Important Habitat of Jelai-Brais Kapat River	<ul style="list-style-type: none"> Thicket and riparian forest of Jelai River the IUP border is in the west of Jelai River up to the forest production. Riparian river can still be restored naturally 	1, 3 and 4	54.54
7	ID07	Tanggung River and other rivers	<ul style="list-style-type: none"> River flows and riverbanks wide of 50 meters on left and right, the river wide is 3-5 meters. Riparian river can still be restored naturally 	1, 3 and 4	38.10
8	HCVM A 01	Padu Empat upstream	Peat land and there a designated as peat and carbon conservation by PT KPAM is connected to the peat land of moratorium area.	HCV4 MA	381.80
9	HCVM A 02	Flood plains of Brais River	Need to conduct water management assessment to protect the Brais River function. As of now, the government had designated buffer river to be at 100 meters from river's edge and excluded from the IUP PT KPAM	HCV4 MA HCV5 MA	1,463.90
10	HCVM A 03 & 04	Tanggung upstream and other rivers	Peat land area designated by PT KPAM for conservation	HCV4 MA	270.90
11	HCVM A 06	Wildlife corridor between HCV1 ID 01 and ID02	Non-forested area between peat forest HCV1 ID01 and ID02 as HCV1MA as wildlife corridors and connectivity should be reforestation	HCV1 MA	42.20
12	HCVM A 07	Wildlife corridor between HCV1 ID 01 and forest in the moratorium area and production forest on Southside	Non-forested area between peat forest HCV1 ID01 and forest in the moratorium area and production forest on Southside as HCV1MA as wildlife corridors and connectivity should be reforestation	HCV1 MA	56.30
13	HCVM A 08	Wildlife corridor between HCV1 ID 04 and forest in the moratorium area on west side	Non-forested area between riparian of HCV1 ID04 and forest in the moratorium area on west side as HCV1MA as wildlife corridors and connectivity should be reforestation	HCV1 MA	126.20
Total HCV + HCVMA					2,871.47

3.4 SOIL AND TOPOGRAPHY ASSESSMENT

The morphology of the area is plains and located about 35 km to the beach.

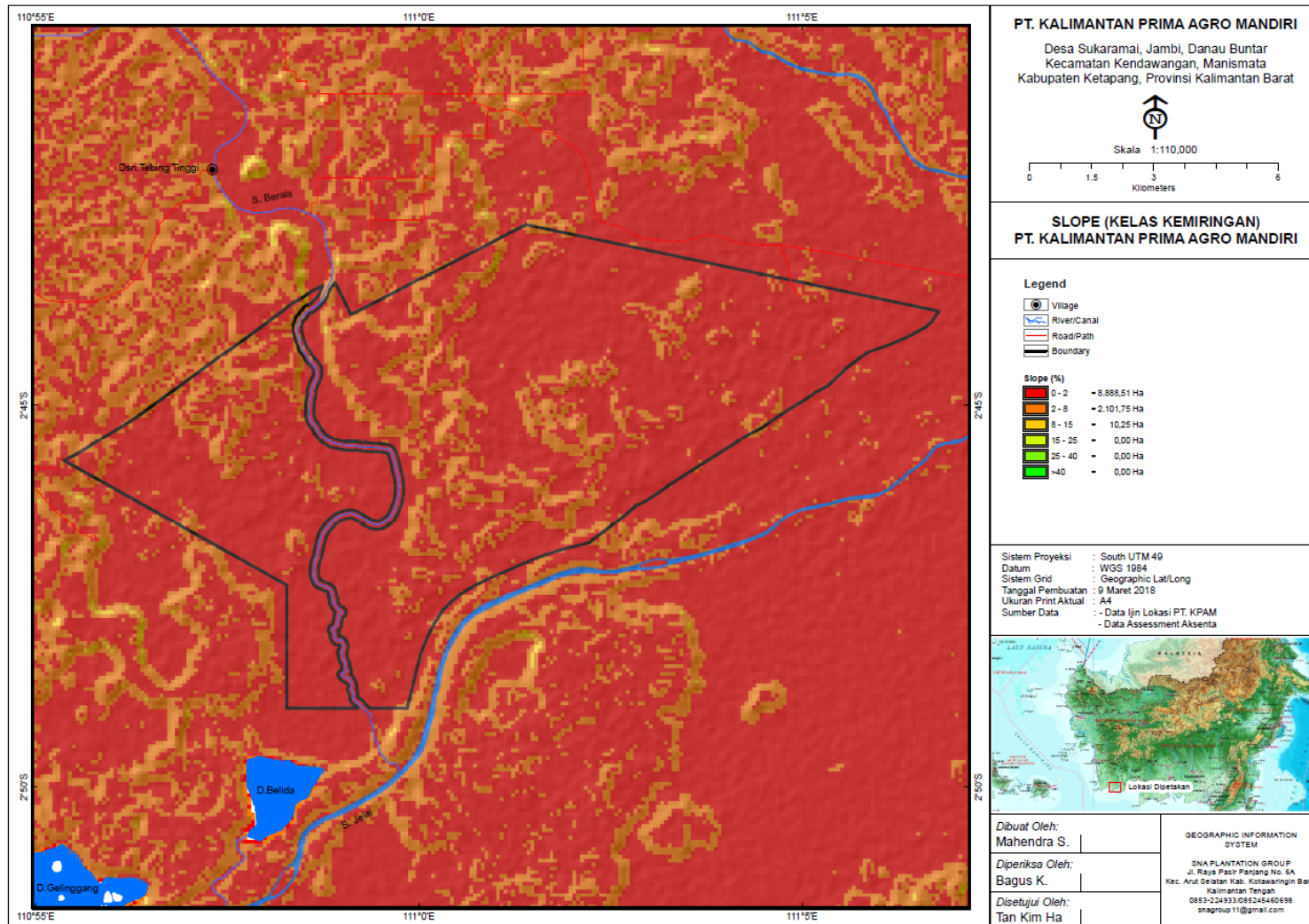


Figure 9: Map of Slope Classification in PT KPAM

Through the field survey and analysis, Aksenta team has recorded that the soil characteristic in PT. KPAM area can be categorized into 3 (three) soil types i.e. **Inceptisols**, **Entisol**, dan **Histosol** (based on the USDA system, Soil taxonomy, 1999). Histosol soil type is commonly referred to as peat soil. As shown in Figure 10, PT. KPAM area comprises 12.12% of haplosaprist (1,369.59 ha) and 4.25% of haplohemist (467.46 ha). Table 16 provides the detailed area (with size in hectares) composition of each soil type in PT. KPAM area.

Table 16: Soil type composition within PT KPAM area

Code	Soil Type	Area	
		Ha	%
T1	Typic Dystrudepts	1029.32	9.36
T2	Typic Endoaquepts	1608.71	14.62
T3	Typic Haplohemist	467.46	4.25
T4	Typic Haplosaprist	1369.59	12.45
T5	Typic Psamments	6525.45	59.32

Due to its properties which contains organic compounds, histosol is very adaptive to anaerobic or saturated water. High organic content was originated from litters and necromass with low bulk density. It therefore becomes vulnerable during drought and the shrinkage may become irreversible if the drainage system is not managed properly. Control on soil subsidence through water management is therefore one of the keys to best practice in the area.

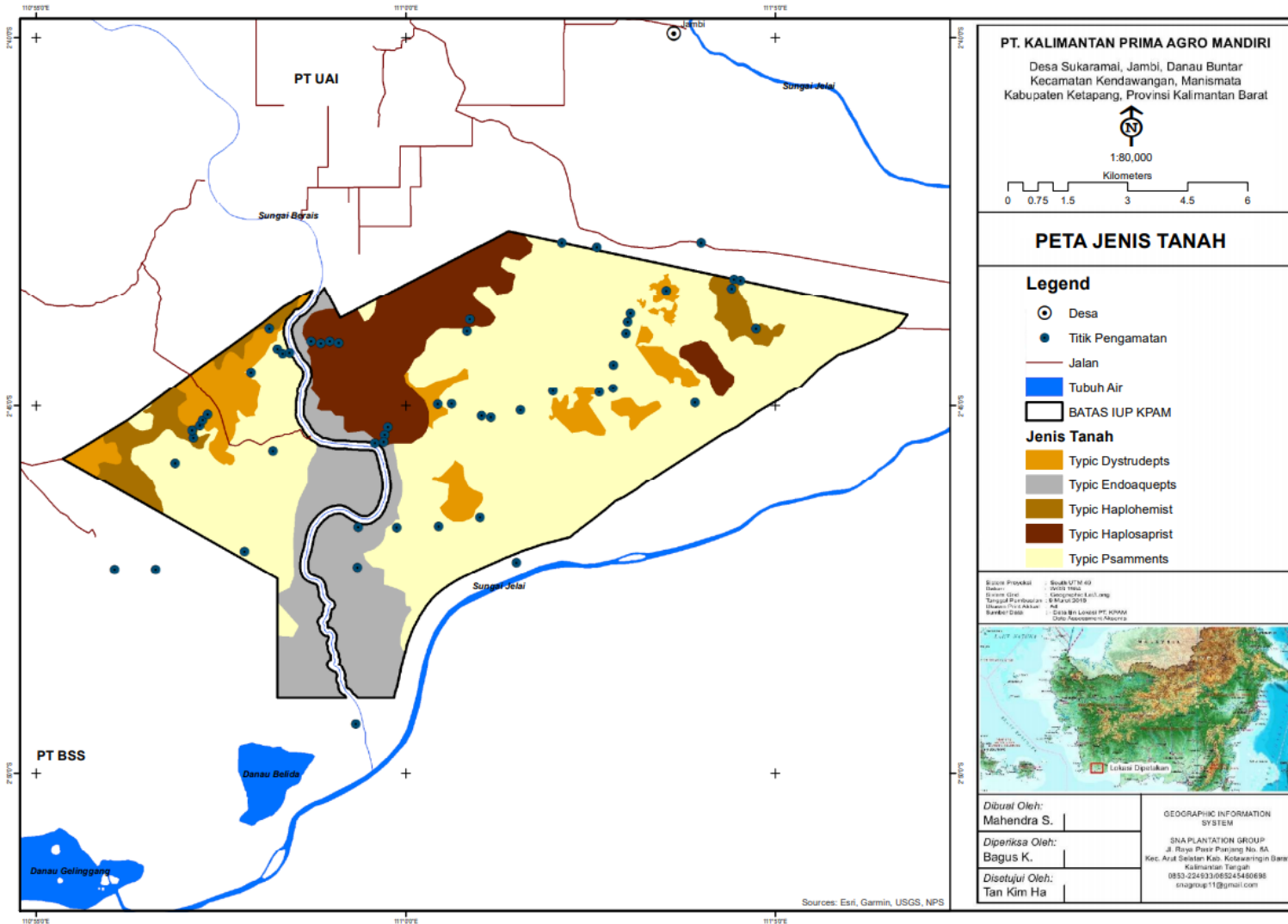


Figure 10: Soil map of PT KPAM

Further peat soil map is produced, which is based on the field verification in March 2016, and the output of the study is shown in Figure 11.

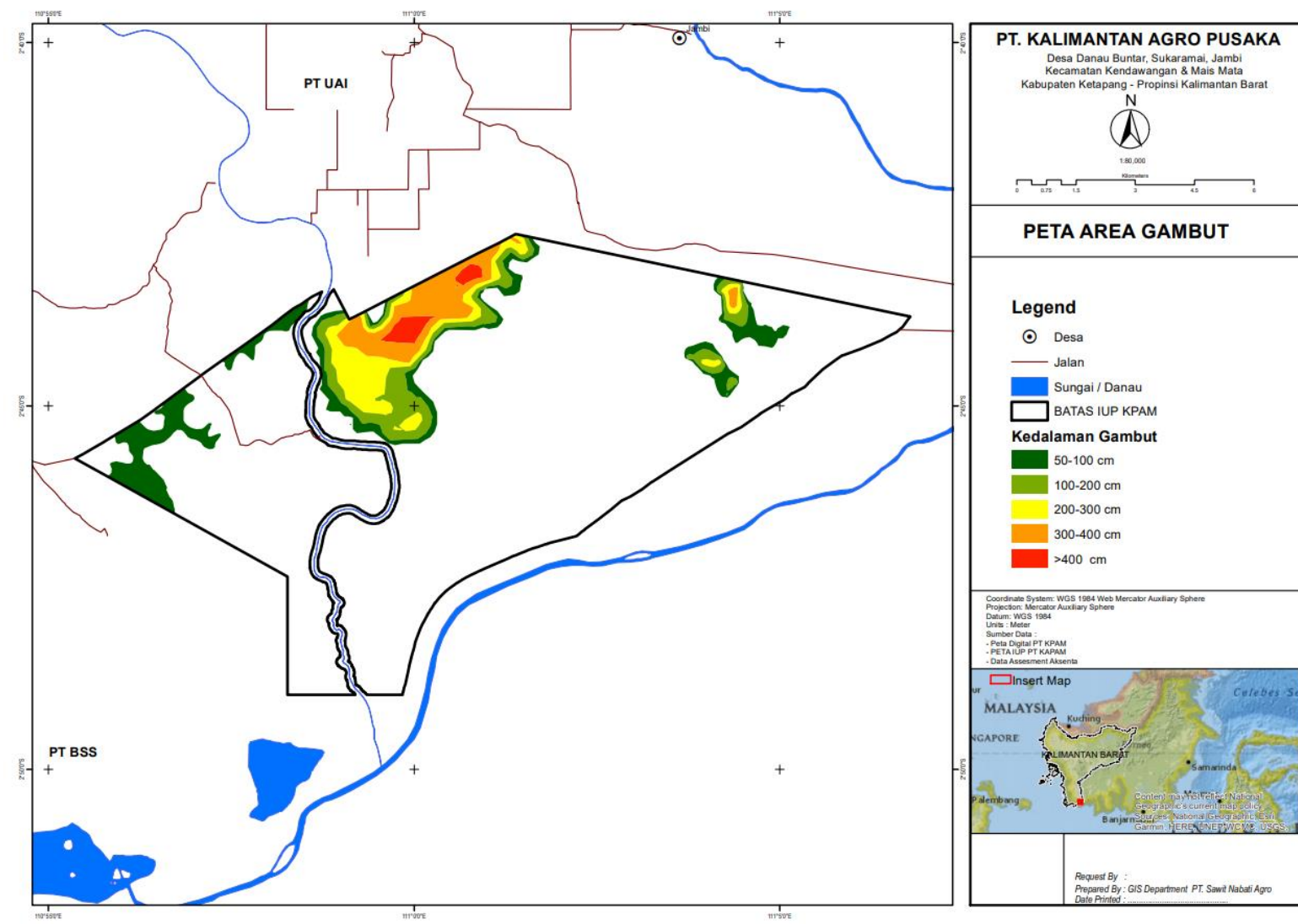


Figure 11: Peat soil map of PT KPAM based on field verification

3.5 CARBON STOCK AND GHG EMISSION ASSESSMENT

Carbon Stock Assessment

The highest carbon source is contributed by peatland (1,676.4 Gg-C) and followed by mineral soil (2,341.8 Gg-C) which amounts to 86.5% of the total carbon stock within PT KPAM. Table 17 and 18 provide the total carbon stock from carbon pools available within PT KPAM.

Table 17: Total carbon stock based on carbon pools and land cover of PT KPAM in 2014 (Mg C)

Carbon pools [*]	Carbon stock of PT KPAM (Gg-C) by Stratum/Land cover ^{**}							Total
	Sf	Sc	BSc	Bu	Op	Wb	Nd	
Area (ha)	2,706.2	5,152.9	5,543.0	5,304.6	4,325.4	475.5	106.2	23,613.8
Above Ground Biomass	165.3	117.0	75.7	3.5	1.1	-	-	362.5
Below Ground Biomass	73.5	52.9	34.3	1.7	0.5	-	-	163.0
Necromass – Litters	27.1	59.9	20.3	4.9	42.1	-	-	154.3
Peat Soil- thickness :	657.6	514.3	425.9	30.2	48.4	-	-	1,676.4
50-100 cm	291.8	289.4	81.2	30.1	20.2	-	-	712.6
100-200 cm	122.1	156.1	93.2	0.1	4.2	-	-	375.7
200-300 cm	90.7	50.4	118.1	0.0	2.4	-	-	261.6
300-400 cm	105.7	13.3	100.1	0.0	13.1	-	-	232.1
400-500 cm	47.3	5.1	33.4	0.0	8.6	-	-	94.4
Mineral Soil	97.6	433.1	598.2	669.3	543.6	-	-	2,341.8
Grand Total (Gg C)	1,021.2	1,177.1	1,154.5	709.5	635.7	-	-	4,698.0
Average (Mg-C/ha)	377.4	228.4	208.3	133.8	147.0	-	-	199.0

^{*}) Not include woody debris, ^{**}) Sf (Secondary forest), Sc (Shrub), BSc (Bush and Shrub), Bu (Bush), Op (Bare soil/open land), Wb (Water body) and Nd (no data)

Table 18: Total carbon stock based on carbon pools and land cover of PT KPAM in 2014 (Mg C) if the AGB is based only on the vegetation with DBH ≥ 5 cm.

Carbon pools [*]	Carbon stock of PT KPAM (Gg-C) by Stratum/Land cover ^{**}							Total
	Sf	Sc	BSc	Bu	Op	Wb	Nd	
Area (ha)	2,706.2	5,152.90	5,543.00	5,304.60	4,325.40	475.5	106.2	23,613.80
Above Ground Biomass with DBH>5cm	150.4	108.8	49.9	0.2	0.0	-	-	309.3
Below Ground Biomass	73.5	52.9	34.3	1.7	0.5	-	-	163.0
Necromass – Litters	27.1	59.9	20.3	4.9	42.1	-	-	154.3
Peat Soil- thickness:	657.6	514.3	425.9	30.2	48.4	-	-	1,676.4
50-100 cm	291.8	289.4	81.2	30.1	20.2	-	-	712.6
100-200 cm	122.1	156.1	93.2	0.1	4.2	-	-	375.7
200-300 cm	90.7	50.4	118.1	0.0	2.4	-	-	261.6
300-400 cm	105.7	13.3	100.1	0.0	13.1	-	-	232.1
400-500 cm	47.3	5.1	33.4	0.0	8.6	-	-	94.4
Mineral Soil	97.6	433.1	598.2	669.3	543.6	-	-	2,341.8
Grand Total (Gg C)	1,006.3	1,168.9	1,128.7	706.2	634.7	-	-	4,644.8
Average (Mg-C/ha)	371.9	226.9	203.6	133.1	146.7	-	-	196.7

^{*}) Not include woody debris, ^{**}) Sf (Secondary forest), Sc (Shrub), BSc (Bush and Shrub), Bu (Bush), Op (Bare soil/open land), Wb (Water body) and Nd (no data)

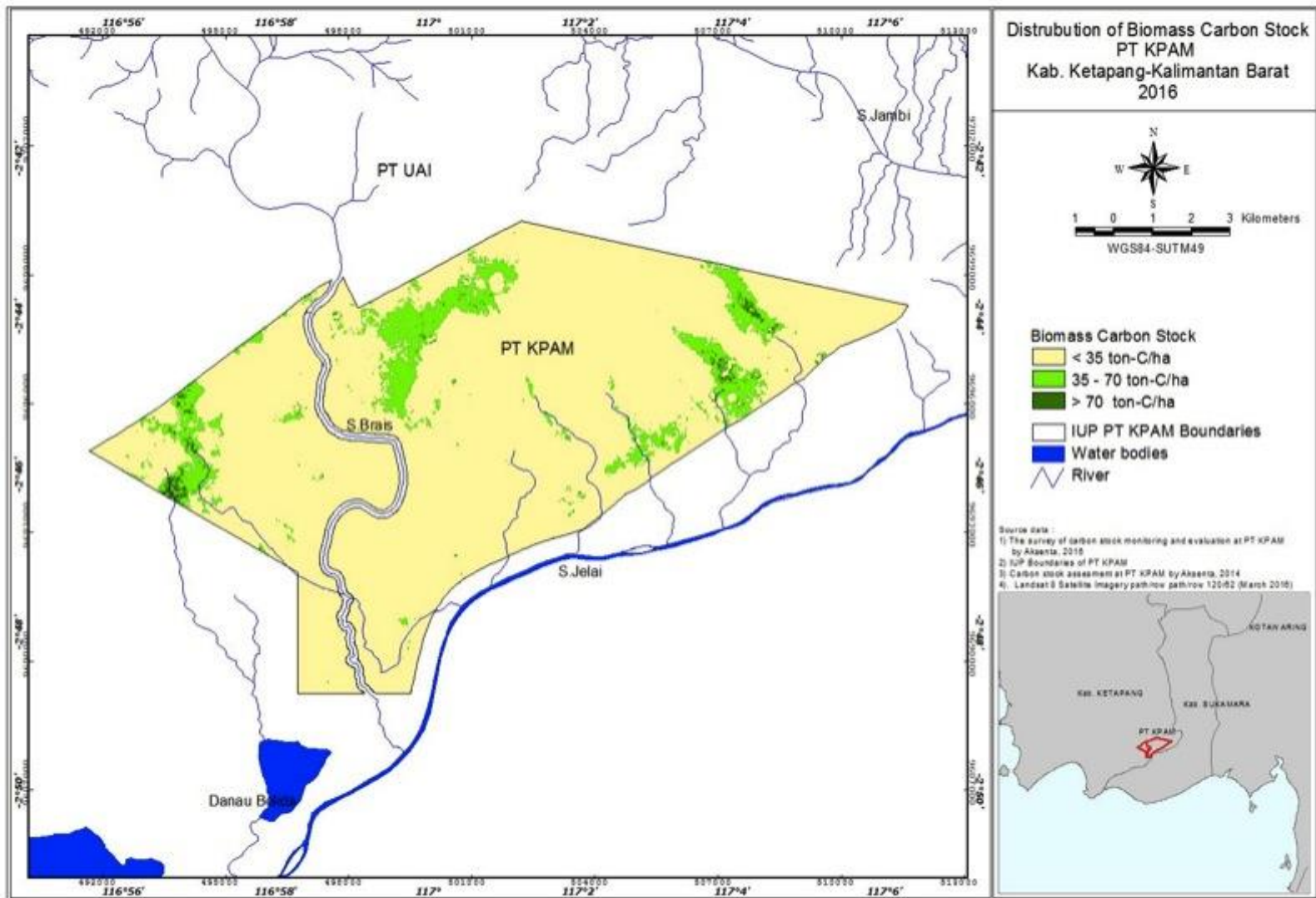


Figure 12: Biomass carbon stock distribution map in PT KPAM

Based on the result from soil assessment and suitability study, all of the area within PT KPAM is suitable for palm oil plantation development including areas of marginal soil. Nevertheless, through its commitment of not clearing land designated for conservation, the company decided not to clear the HCV and HCS area and including no new development on peatland areas regardless of depth.

This is a confirmation by the grower that the location of the peatland (more than 300 cm depth) has been undertaken using the latest available version of the RSPO GHG Assessment Procedure for estimating the carbon stock of above and below ground biomass for land earmarked for new oil palm development and that the potential net GHG emission arising from the development has been estimated. In addition, the grower confirms that the assessment includes a plan to minimize net GHG emissions which takes into account avoidance of land areas with high carbon stocks and/or sequestration options.

GHG Emission Assessment

Plantation operation is one of greenhouse gas emission and fixation source. Emissions from plantation operation consists of (i) land clearing, (ii) production and fertilizers, (iii) N₂O emission from fertilizers, (iv) fuel usage in the plantation, and (v) emission from peat decomposition, when there is planting in peat soil. Fixation sources from plantation operation consist of crop sequestration and conservation credit. Based on the analysis on components of emission and fixation from new plantation development in the study area, fertilizers will be the main source of GHG emission. Table 19 provides further details on the result of GHG emission and fixation analysis on new plantation development.

Table 19: Estimated GHG emission from new palm plantation development plan

Sources	Value	Unit
Land clearing	8,720.00	ton-CO ₂ e/yr
Fertilizers procurement and application	19,857.00	ton-CO ₂ e/yr
N ₂ O (fertilizer application & EFB Composting)	7,420.87	ton-CO ₂ e/yr
Fossil Fuel	1,391.20	ton-CO ₂ e/yr
Crop sequestration (one cycle of production 30 years)	-103,576.50	tonCO ₂ e
Carbon sequestration of conservation area	-17,018.10	ton-CO ₂ e/yr
Emission of Peatland*	167,176.10	Ton-CO ₂ /ha.yr

*The total area of peatlands as results of the evaluation was 1,837.10 ha. Most of the peatland in PT KPAM is already degraded with the land cover consisting of bushes and shrubs.

Sources of CO₂e emissions from mill activities consist of wastes (POME), fossil fuels consumption, and the use of electricity from wide network of sources which is not self-produced. Carbon sequestration can be generated from the conversion of CH₄ emissions from POME into fuels or electrical energy, and also the selling of EFB as substitutes for coal.

Data and information obtained from PT KPAM used in emission calculations indicate the following matters:

- Each estate has produced FFB which can be used to predict POME with ratio value tPOME/tFFB of 0.6725
- Mill is using diesel fuel for its operations at 4.8 lt/ton FFB
- No utilization of POME for fuels and electrical energy
- No sales and utilization of EFB for application and fuel
- No utilization of palm kernel

Table 20: Proposed CO₂e emissions from the mill of PT KPAM

POME	
Planted area (ha)	7,598.30
Expected production FFB (ton/yr)	255,500.00
Quantity of POME production (ton/year)	171,824.00
Total CH ₄ emission (ton/yr)	2250.90
Fossil Fuel Consumption	
Diesel Consumption (kilo liter/year)	1,226.00
Estimated CO₂e emissions from the mill of PT KPAM	
CO ₂ e emission (ton-CO ₂ e/yr) (POME)	3,826.40
CO ₂ e emission (ton-CO ₂ e/yr) (Fossil Fuel Consumption)	50,082.00
Total Emission	53,908.4

Scenario Testing for New Development Options

The purpose of the synthesis of emissions estimation is to know the status of net emissions. The results of CO₂e emissions and sequestrations calculation in the area of PT KPAM are synthesized and presented by the sources, which are field/plantations and mill. The data from the synthesis of calculations is presented in graphs and tables, so that the value of net emissions can be identified. Positive values indicate that the release of GHG emissions into the atmosphere is higher than the sequestration, whereas negative emissions values show that GHG sequestration is greater than the release. A zero value indicates a balance between emissions and sequestration. Three scenarios were prepared to determine the optimal development plan to reduce the GHG emission in the development plan.

Table 21: Scenario Testing for New Development Options

Scenario		Details		
Scenario 1 (S1)		The synthesis of field and mill emission in KPAM for current state		
Scenario 2 (S2)		Restoration and maintain the water level in the peatland 40 cm		
Scenario 3 (S3)		Restoration and rewetting of peatland (0-5 cm)		
Field Emission				
No	Description	S1 (tCO ₂ e/yr)	S2 (tCO ₂ e/yr)	S3 (tCO ₂ e/yr)
1	Land conversion	7,598.30	7,598.30	7,598.30
2	Crop Sequestration	-103,576	-103,576	-103,576
3	Fertilizer (mineral) manufacture and transport	19,857	19,857	19,857
4	N ₂ O from fertilizer (mineral) application	7,421	7,421	7,421
5	Fuel Consumption	1,391	1,391	1,391
6	Peat Oxidation	167,167	66,867	8,358
7	Sequestration in conservation areas	-17,018	-17,018	-17,018
Total Field Emission		82,840.3	-16,339	-74,847
Mill Emission				
1	POME	50,082	50,082	50,082
2	Diesel fuel	3,826	3,826	3,826
3	Imported electricity	0	0	0
4	Mill electricity credit	0	0	0
5	POME electricity credit	0	0	0
6	Shell credit	0	0	0
7	EFB power credit	0	0	0
Total Mill Emission		53,908	53,908	53,908
Total Field and Mill Emission		137,870	37,570	-20,938

In Scenario-1, the total emission of PT KPAM without peat management is 137.870 tCO₂e /year. The largest emission is a result of peat oxidation.

Scenario-2 resulted in negative net emissions for field emission, i.e. activities in the field can minimize GHG emissions. However, if the field emissions are accumulated with the result of mill emissions, there is still a positive net emission. Generally, overall activity by PT KPAM in one cycle oil palm production is still not be able to minimize GHG emissions. Peat oxidation is still the largest source of emissions

Scenario-3 produces a net negative emission for the entire production process of palm oil. Rewetting can be done by maintaining the water level of at least 5 cm from the surface of the peat. Emissions from peatland will be zero if the entire peat surface is waterlogged. In addition, keeping the natural succession and re-vegetation may also be done to increase the biomass carbon stocks in peatland. Scenario-3 have been selected to conduct the management plan of GHG mitigation.

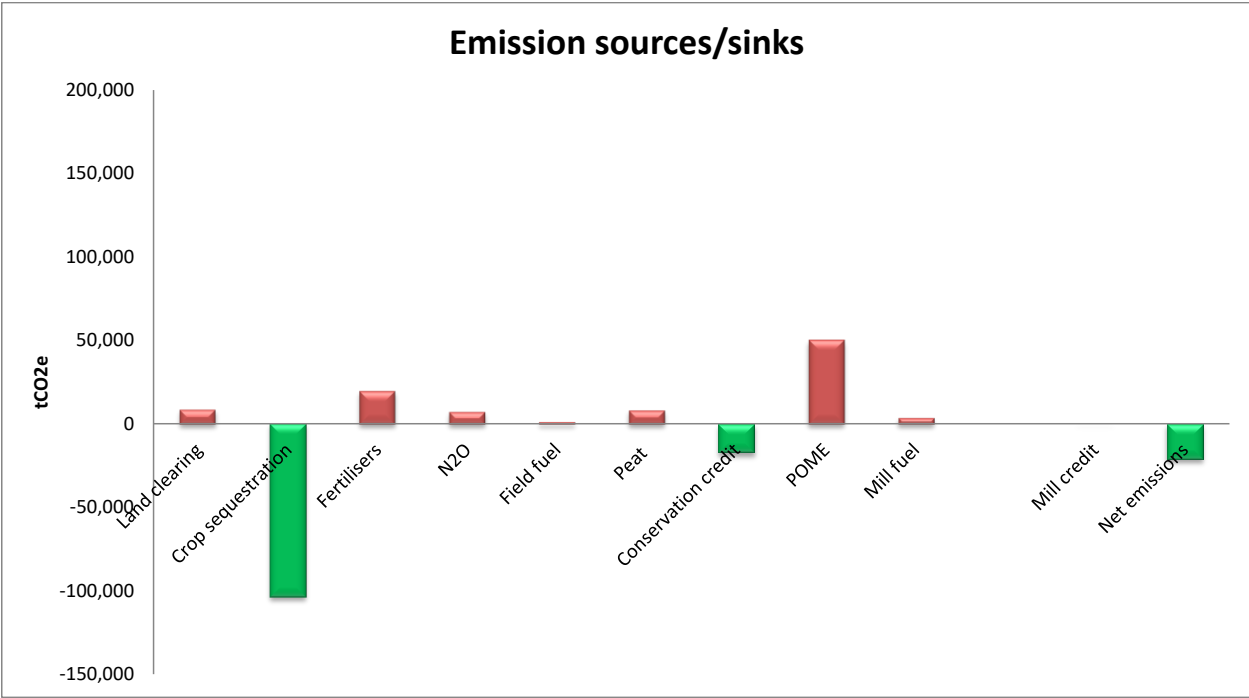


Figure 13: Field and mill emission balance in PT KPAM base on Scenario-3: Restoration and rewetting of peatland

3.6 LAND USE CHANGE ANALYSES

Land use change analyses (LUCA) was carried out using the LANDSAT 5 TM imagery to determine the changes of land cover or vegetation since November 2005. No compensation liabilities in this assessment as there is no land clearing and oil palm establishment has occurred in this landscape.

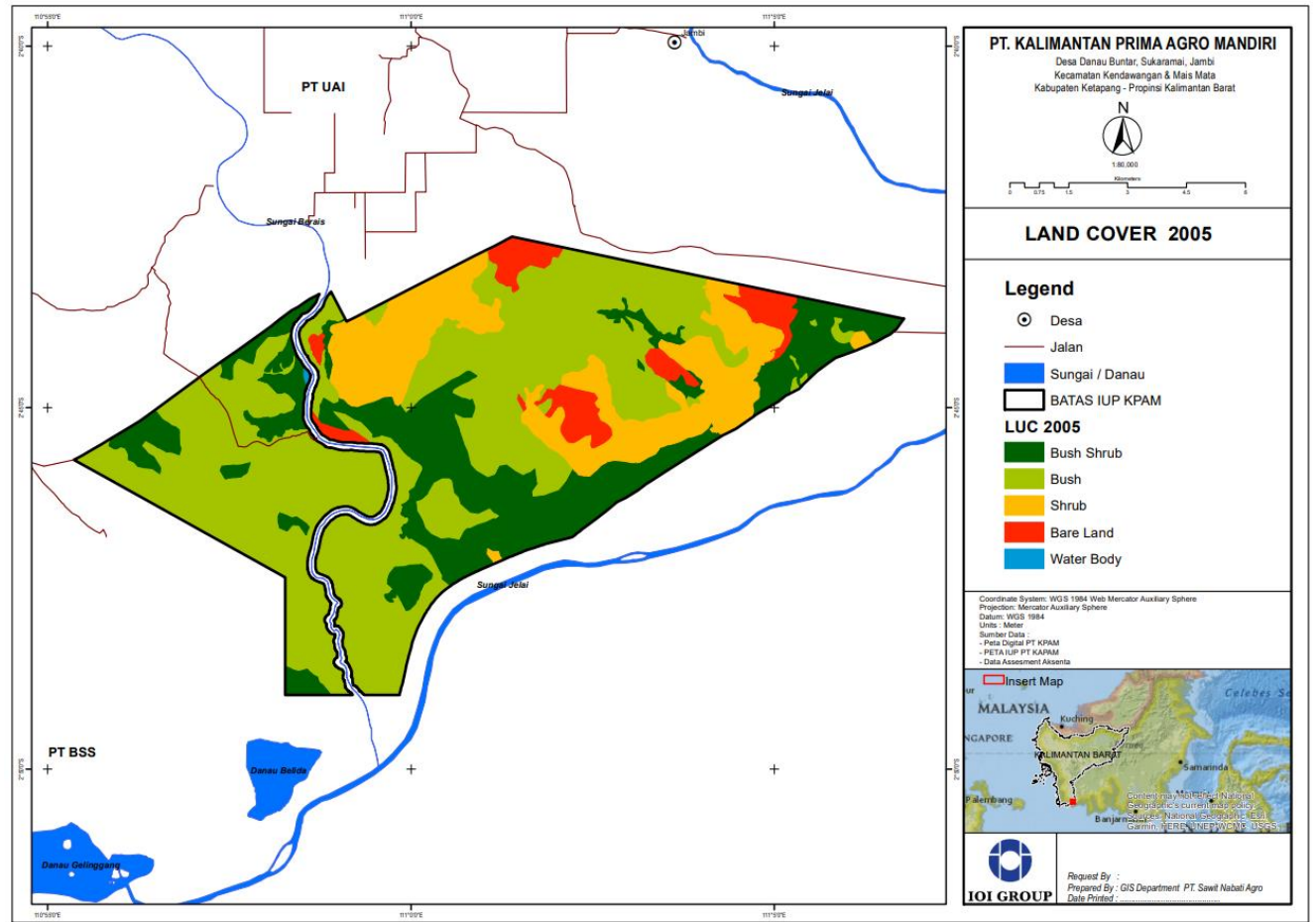


Figure 14a: Land Cover 2005

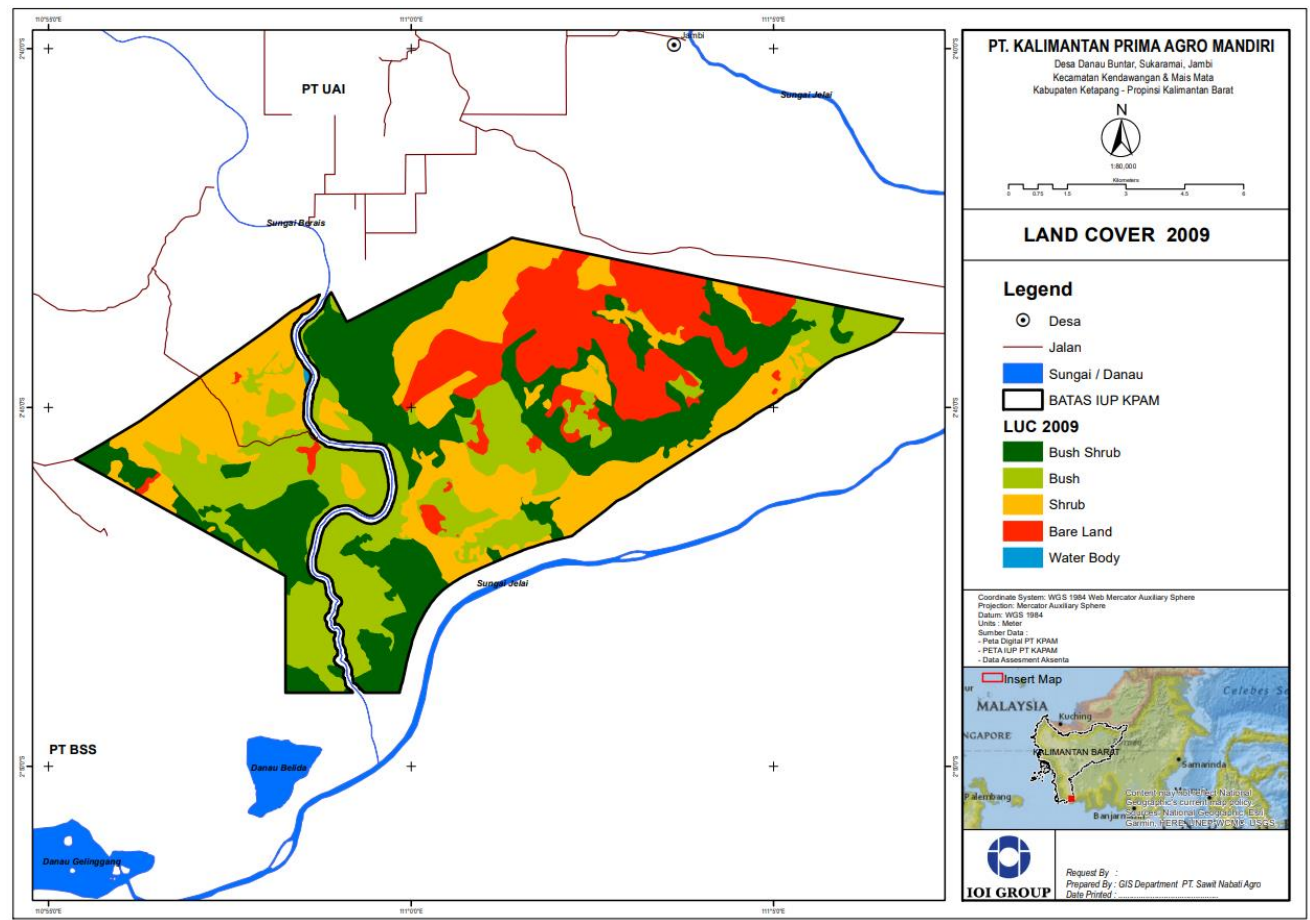


Figure 14b : Land Cover 2009

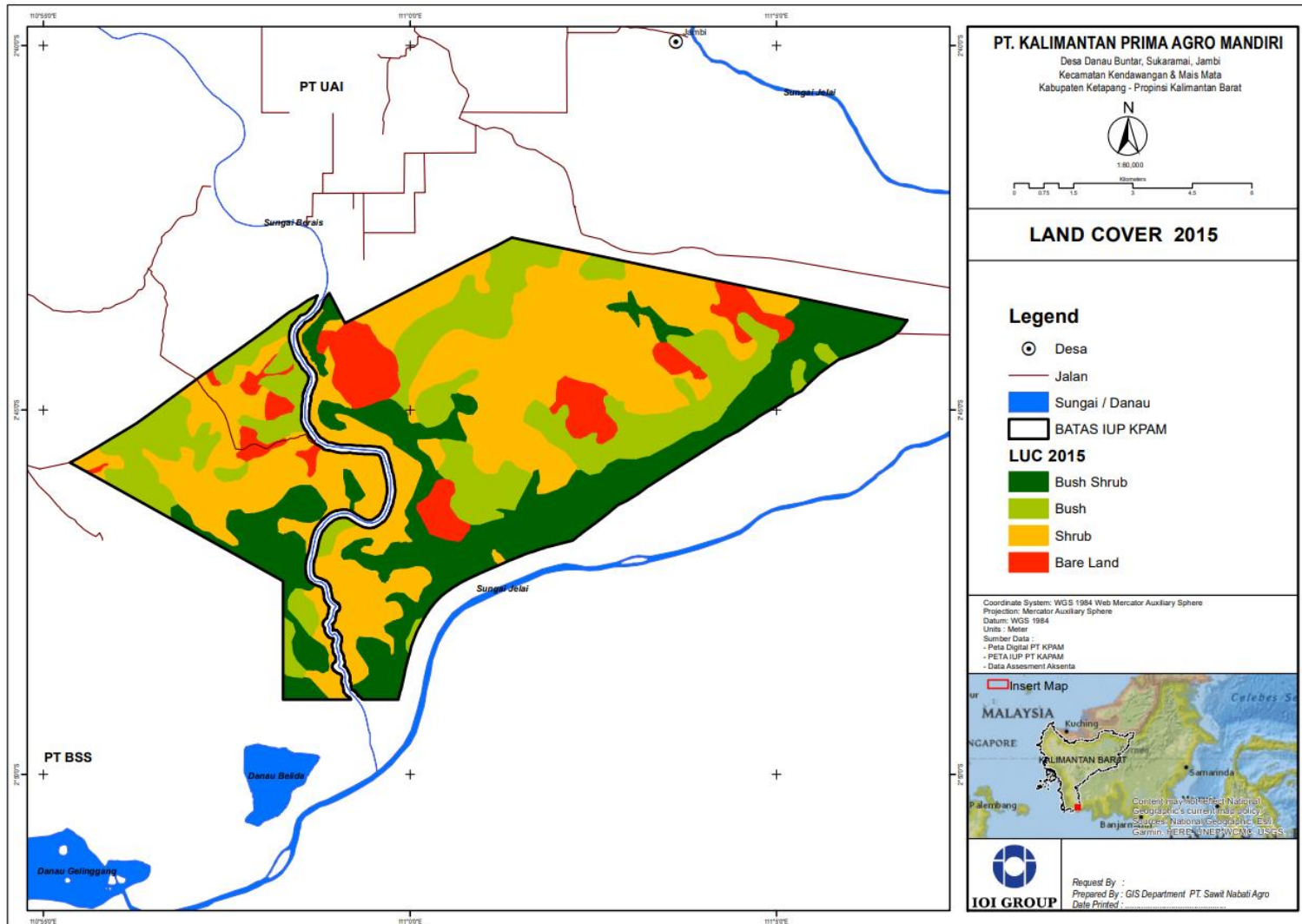


Figure 14c: Land Cover in 2015

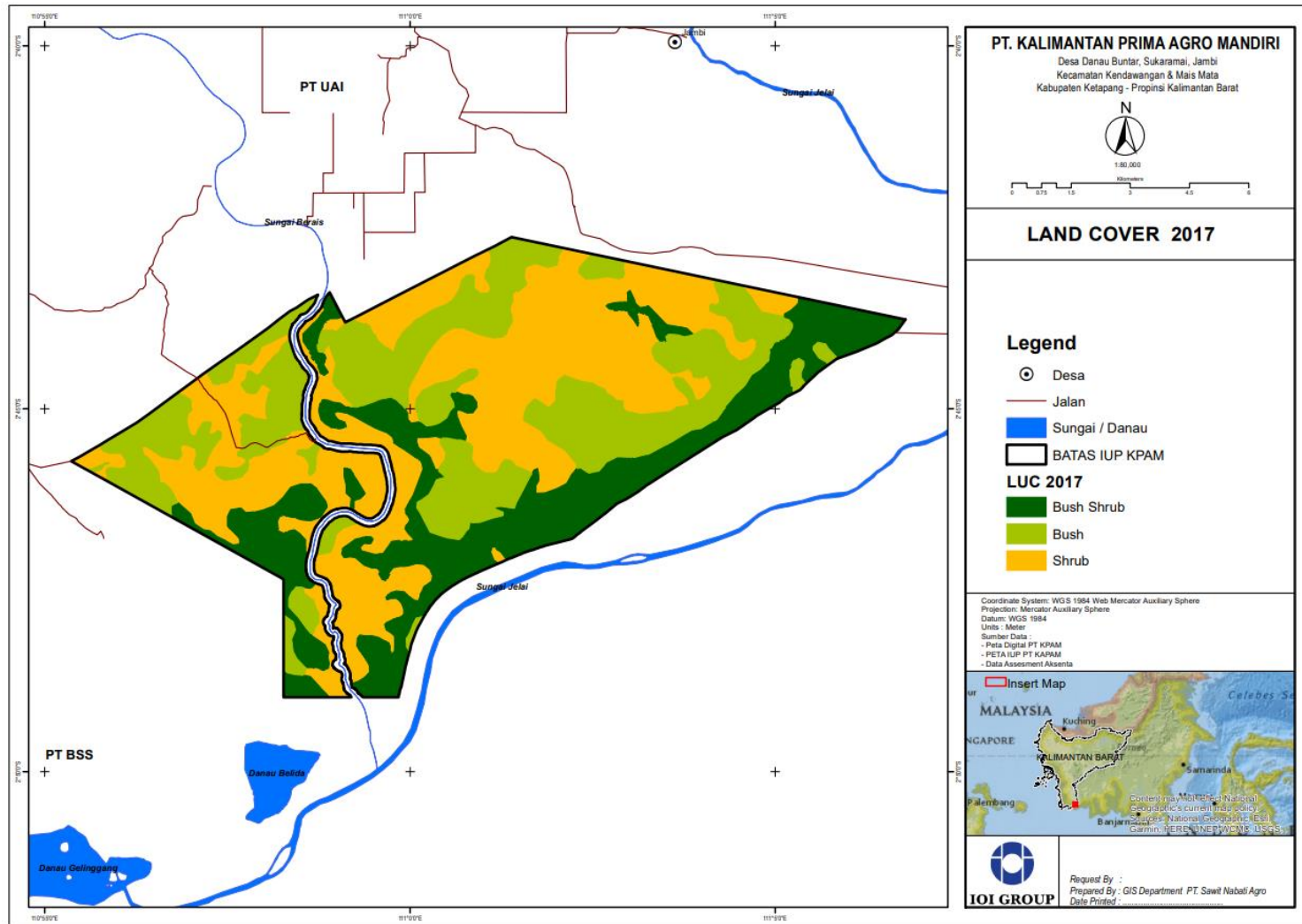


Figure 14d: Land Cover in 2017

Figure 14a to 14d showing the land use change in PT. KPAM (2005-2017)

The findings also show that within PT. KPAM's location permit plan, no primary forest was lost or damaged by land clearing for commercial purposes in the period of November 2005 to April 2015. Historically, forest areas in this area had been degraded by timber exploitation since the early years (1970s - 1990s), followed by fires in 1997. In PT KPAM area (especially in the permitted area), there is no lost of HCV 4, HCV 5, and HCV 6, which is due to land clearance for commercial purposes, from November 2005 to April 2015. Areas that is important for communities, such as water resources, source of basic needs, important area for cultural purposes, still existed until April 2015.

Changes in land cover from November 2005 to April 2015, and up to 2017 is mainly due to non-commercial land clearing, natural processes (succession) and community cultivation activities along the Brais River. The following table shows the tabulated data of land cover that was classified in year 2015 to year 2017.

Land Cover		2005 (Ha)	2009(Ha)	2015 (Ha)	2017 (Ha)
Interpretation	Bush	6,055.38 (55.05%)	2,948.56 (26.81%)	2,546.64 (23.25%)	3,554.64 (32.31%)
	Shrub	1,802.80 (16.39%)	2,859.19 (25.99%)	4,704.76 (42.77%)	4,704.76 (42.77%)
	Bush-Shrub	2,526.65 (22.96%)	3,214.31 (29.22%)	2,740.60 (24.91%)	2,740.60 (24.91%)
	Bare Land	615.17 (5.60%)	1,977.93 (17.98%)	1,008.00 (9.16%)	-

The land changes that is detected from November 2005 to December 2017, is significant where, the bush and shrub vegetation dominated the land cover types. The following Figure 15, show the chronology of the land use changes in and surrounding area of PT. KPAM. From 2015 to 2017, no land use activities were carried out since several studies for the NPP is still in progress up to January 2018.

It was confirmed that there was no land cover changes or development in the IUP, except there were encroachment activities, who was construct small road access in year 2016. The activity was stopped by our enforcement unit. Police Report was made and request police to do patrol in PT KPAM area. The report of the police is attached herewith with the NPP Report, and this incident (including report) was submitted to RSPO.

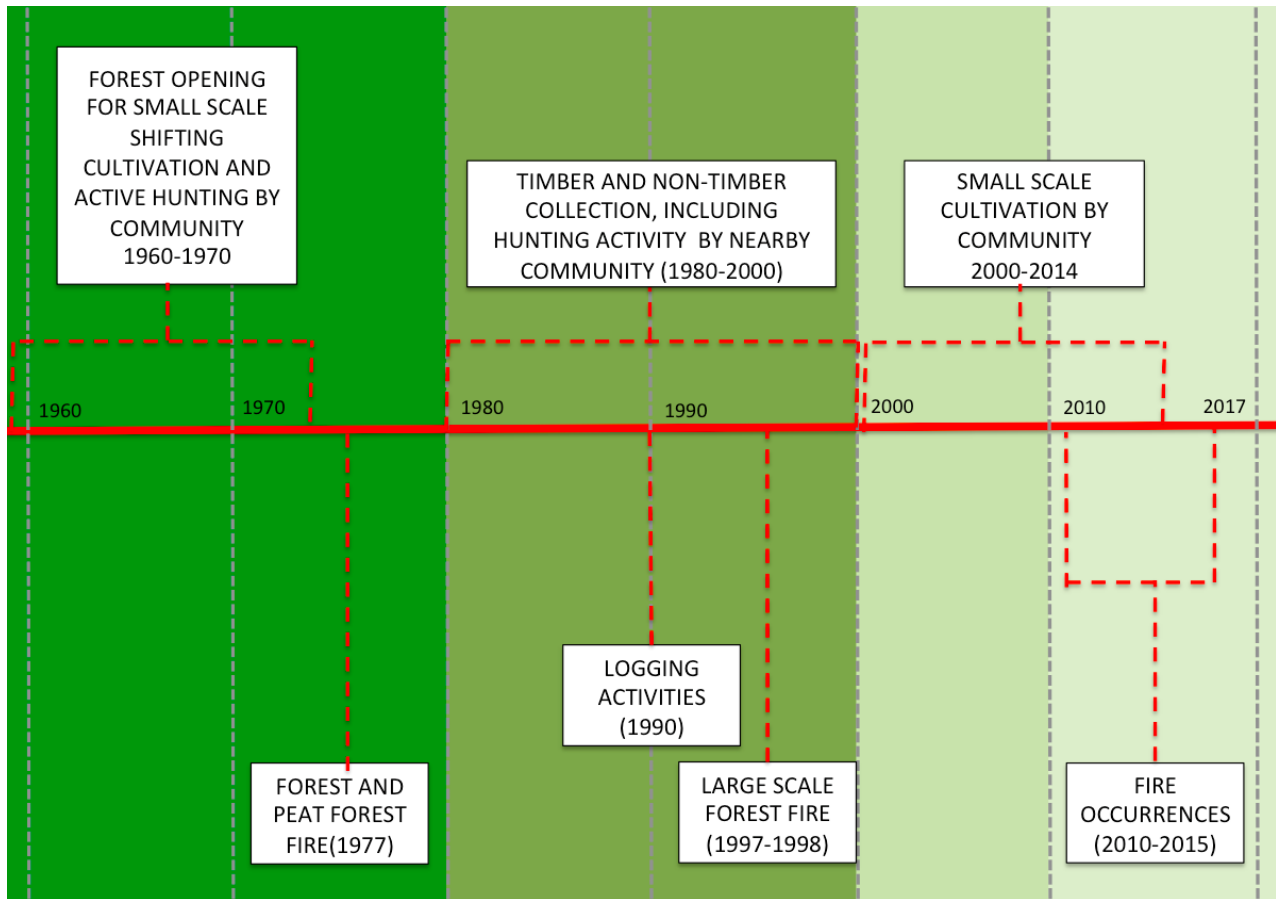


Figure 15: Landuse changes process in and surrounding area of PT. KPAM (1960-2017)

3.7 FPIC PROCESS

The establishment of plantations can imply major changes for local communities and indigenous peoples. Plantations require large areas of land and often this land is owned and used by local communities who have prior rights to these areas.

International human rights laws and business best practices, recognize that – even where national legal frameworks may provide weak or absent protections of customary rights to land – plantations should not be established on indigenous peoples' lands without recognition of their prior rights to the land and of their right to control what happens on that land. The principle which encapsulates these rights is 'Free, Prior and Informed Consent'.

In PT. KPAM, recognition of the community prior rights to the land was carried out through a series of public consultations. The public consultation was carried out through a formal meetings including individual interviews. Formal meetings were conducted separately for each of the village. The key finding of this process include uncertainties of the boundary which is due to the official demarcation of the village boundary is not completed

The following Table 22 and Table 23 summarize the outputs that was gathered from individual interviews with the representative from local community and also from key stakeholders

Table 22: Summary of public consultation with communities

No	Issues	Justifications	Recommendations
1	Community involvement In swamp management	<p>a. Lack of knowledge and skill in managing the swamp ecosystem</p> <p>b. Location of the Villagers' settlement is at "Natai", where the area is surrounded by swamp areas.</p> <p>c. For a long term planning, it is good to provide guideline to make sure the ecosystem of the swamp could be managed sustainably.</p>	Develop Capacity building programme for community on swamp management
2	Boundary Demarcation for PT. KPAM, especially adjacent to Danau Buntar, Sukaramai and Jambi Village.	<p>The villagers claimed that they don't know whether their current land is included in the location permit ("IL") for PT. KPAM.</p> <p>If there is an overlap, proper compensation scheme / programme (i.e. PLASMA) need to be implemented.</p>	<p>Local community participatory mapping, and follow up with solution scheme such as PLASMA programme need to be carried out.</p> <p>Any resolution scheme (i.e. PLASMA) need to be presented to the local community to get their concern, before it can be implemented.</p>
3	Proper Management of river network ecosystem	<p>Brais River is one of the rivers that is used by the community for their daily subsistence and mode of transportation; Brais River also used by other villagers from Kalimantan Tengah Province.</p> <p>Lower stream may effected by the upper stream activities</p>	Landscape approach management plan to include management of river ecosystem Conservation plan for Brais River ecosystem and riverbanks protection in accordance with government regulation need to be developed and implemented in order to address the management of HCV5
4	Land fire monitoring, control and mitigation measures	Forest / Land fires is recorded to be frequently occur the PT KPAM area, particularly during dry season.	PT. KPAM to develop Land fire monitoring, control and mitigation measures, and
5	Avoid further orangutan habitat fragmentation and degradation	Abundance of orangutan in the past, sighted along the Brais River is high compared to the current situation. orangutan also sighted along the riparian forest of Jelai River.	<ul style="list-style-type: none"> • Landscape approach management plan to look into connecting and improving the habitat for orangutan. • Orangutan habitat in PT. KPAM need to be identified and bottleneck need to be identified. • Connectivity of the population is recommended to be improved through securing and restoration of key ecological corridor
6	Community empowerment programme	Previous experience from HPH improve work skills of the local communities. Most of the community is recruited by the nearby plantation companies. This indirectly enhance the livelihoods capacity of the community (HCV5).	Since most of the villagers located far from PT. KPAM, and these local communities deal with the nearby plantation, it would be good to provide them a relevant skill or training on how to be part of the landscape approach management plan.
7	Working opportunity	The presence of oil palm plantations such as PT HSL and PT UAI, provide positive impact on the community's employment opportunities	PT. KPAM give priorities to the local community specially working opportunities.

Table 23: Summary of stakeholder consultation

No	Issues	Justifications	Recommendations
1	Proper Strategy in Peat Mapping and Management Programme	<p>Key strategy in Peat Management includes</p> <ul style="list-style-type: none"> • Water Management. Monitoring should be done continuously, especially peat land humidity. The easiest way is to monitor water levels and rainfall; • Non-forested peat should receive more attention because of high risk of land fires, and should be restored. • Forested peat lands should be managed as conservation areas 	Management Measures for HCV and HCV MA at the peat land need to be carried out with clear SOP.
2	Mapping and Management of Orangutan habitat.	<ul style="list-style-type: none"> • Potential orangutan conflict may occurs if the key habitat of orangutan cleared or developed for oil palm. • The key habitat for orangutan need to be surveyed and map properly. • Orangutan habitat should be excised from the plantation development 	Management measures for HVC1 need to make sure habitat for orangutan is not cleared.
3	The need to manage forest prevention and monitoring programme throughout the HCVs landscape	<ul style="list-style-type: none"> • Peat land in PT. UAI area is located adjacent to PT KPAM • Potential of land fires not only occurred in natural areas of PT KPAM, but also In PT. UAI • Both side will be affected if forest/land fires is not monitored collaboratively in both side; • Proper coordination between PT UAI and PT KPAM in managing forest/land fires. 	PT KPAM to coordinate with PT UAI in managing the forest/land fires in the HCV areas.
4	Collaboration and Cooperation to manage all the HCVs is Important	<ul style="list-style-type: none"> • Conservation of protected wild plants, wildlife, forest and prevention of land fires in PT KPAM concession areas and surrounding areas, should be done collaboratively with all the stakeholders 	<ul style="list-style-type: none"> • Cooperation with all stakeholders should be developed (PT KPAM, PT BMJ and PT UAI). • MOA or MOU to implement conservation and protection programme is recommended.
5	Integrate the management of fragmented peat forest with the management of Brais River	<ul style="list-style-type: none"> • Landscape approach in HCV management is recommended; • PT KPAM area is located at the lower stream of Brais River, while PT BMJ located at the upper stream. Therefore, any activity at the upper stream in PT. BMJ, will indirectly effect the lower stream, This will also effect the lower peat land forest; • Integrate the management of fragmented peat land forest, with the management of Brais river . 	<ul style="list-style-type: none"> ▪ Memorandum of Understanding between several key stakeholders (PT UAI, PT BMJ, and PT KPAM), government (BKSDA), and local community is recommended in order to address the management of peat land forest that is located at the lower stream. ▪ This MOU could be also become a foundation for each party in managing other HCVs areas.
6	Detail mapping of the important ecosystem	<ul style="list-style-type: none"> • Detail information of the HCV3 (type on forest) is required. • The Brais River flooding area as HCV4MA • Brais river and other wetland areas need to be mapped. 	Brais River flood prone area is defined as HCV4 MA, and specific management and monitoring plan to manage this river is recommended.
7	Integrate management of HCV and HCS	Management of HCV areas should be integrated with other conservation schemes such as HCS and peat lands.	Management plan for HCV and HCS need to be developed properly so that their is no overlap of efforts or management activities.

3.6 Summary of impacts due to the new oil palm plantation development.

The summary of the impacts due to the development of new oil palm plantation in PT.KPAM, is described in the following table.

No	Type of Assessment	Positive	Negative
1	Social Impact	Creation of job opportunities, improvement of basic infrastructure (road and water supply), Increase of community income if partnership (PLASMA) is established	Decrease the total land area that could be used by local community; Future claim by the local communities due to uncertainty boundaries; Degradation of water quality;
2	Environmental Impact	Increase in economic activity, which directly increase community income	Significant changes in drainage pattern, risk of land fires, decrease flora and fauna diversity including water biota diversity, Physiographical changes and decrease of water quality
3	HCV Assessment		New plantation development will effect the HCV1, HCV3, HCV4 and HCV6 if proper measures is not in place.
4	Soil and Topography Assessment	No significant steep area that is found in PT KPAM	Peat soil is found in PT KPAM. New plantation development will not effect this peat soil if the area is excised from the plantation development and proper drainage system/rewetting system is in place.
5	Carbon Stock Assessment & GHG Emissions	Carbon stock that is found from the assessment is very low since most of the area in PT KPAM is covered by shrub. In a longer period, with proper land use planning, development of oil palm in PT KPAM will enhance the carbon stock.	High Carbon Stock is found in the peat soil area. New plantation development will not effect the Carbon Stock if the peat area is excised from the plantation development.
6	Land Use Change Analyses	No primary forest was found in PT KPAM since November 2005 to April 2015. New plantation development will not cause any forest lost (or effect the HCV4, HCV5 and HCV6)	
7	FPIC	Work opportunities and Community empowerment programme	Boundary demarcation and transparent in land management issues. The impact of the New plantation development is expected to be minimal, if FPIC is applied in managing the relationship with the community to manage KPAM at a landscape level.

Figure 16 shows the location of the proposed conservation areas (HCV=530.17 and HCVMA=2,341.30) within PT KPAM. Table 24 shows the detail of hectareage for conservation area.

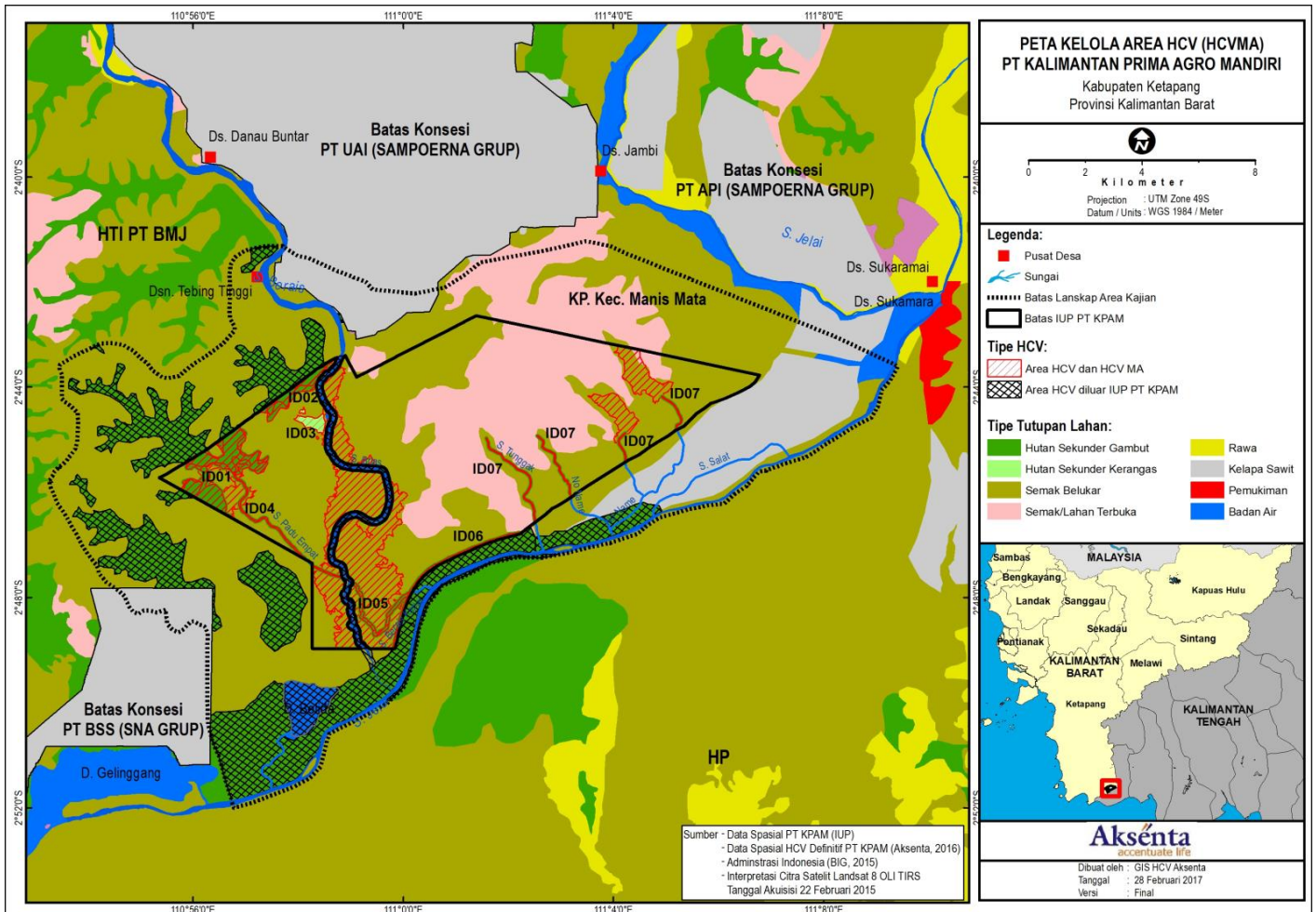


Figure 16: Proposed Conservation Areas

Table 24: Hectarage of Conservation Areas (HCV Area and HCV Management Areas)

No	ID	Location	Location Description	HCV Type	Area (ha)
1	ID01	Peatswamp secondary forest	Peatswamp secondary forest within the IUP connected to the Moratorium area	1, 3, 4 and 6	265.39
2	ID02	Peatswamp secondary forest	Peatswamp secondary forest within the IUP PT KPAM connected to the production forest in the north	1, 3, 4 and 6	59.65
3	ID03	Heat (kerangas) forest	In the west of Brais River and southern part of Peatswamp secondary forest	1, 3 and 4	44.66
4	ID04	Paduempat River	<ul style="list-style-type: none"> River flows and width of riverbanks to be 50 meters on left and right, the river's width would be 3 m to 5 m Riparian river could still be restored naturally 	1, 3 and 4	29.73
5	ID05	Brais Kapat River and its riverbank	<ul style="list-style-type: none"> River flows and the width of riverbanks to be 50 meters on left and right, the river wide is 5-8 meters. Riparian river can still be restored naturally 	1, 3 and 4	38.10
6	ID06	Important Habitat of Jelai-Brais Kapat River	<ul style="list-style-type: none"> Thicket and riparian forest of Jelai River the IUP border is in the west of Jelai River up to the forest production. Riparian river can still be restored naturally 	1, 3 and 4	54.54
7	ID07	Tanggung River and other rivers	<ul style="list-style-type: none"> River flows and riverbanks wide of 50 meters on left and right, the river wide is 3-5 meters. Riparian river can still be restored naturally 	1, 3 and 4	38.10
8	HCVM A 01	Padu Empat upstream	Peat land and there a designated as peat and carbon conservation by PT KPAM is connected to the peat land of moratorium area.	HCV4 MA	381.80
9	HCVM A 02	Flood plains of Brais River	Need to conduct water management assessment to protect the Brais River function. As of now, the government had designated buffer river to be at 100 meters from river's edge and excluded from the IUP PT KPAM	HCV4 MA HCV5 MA	1,463.90
10	HCVM A 03 & 04	Tanggung upstream and other rivers	Peat land area designated by PT KPAM for conservation	HCV4 MA	270.90
11	HCVM A 06	Wildlife corridor between HCV1 ID 01 and ID02	Non-forested area between peat forest HCV1 ID01 and ID02 as HCV1MA as wildlife corridors and connectivity should be reforestation	HCV1 MA	42.20
12	HCVM A 07	Wildlife corridor between HCV1 ID 01 and forest in the moratorium area and production forest on Southside	Non-forested area between peat forest HCV1 ID01 and forest in the moratorium area and production forest on Southside as HCV1MA as wildlife corridors and connectivity should be reforestation	HCV1 MA	56.30
13	HCVM A 08	Wildlife corridor between HCV1 ID 04 and forest in the moratorium area on west side	Non-forested area between riparian of HCV1 ID04 and forest in the moratorium area on west side as HCV1MA as wildlife corridors and connectivity should be reforestation	HCV1 MA	126.20
Total HCV + HCVM					2,871.47

4. IMPLEMENTATION OF THE MANAGEMENT PLANS

4.1 Team responsible for implementation of management plans

Table 25 show the key personnel that is involved during the development of the Implementation Plan or Management Plan.

Table 25: Organizational information and personnel involved in planning and implementation

Mr. Tan Kim Ha	Head of Plantation
Mr. Bisman Sianturi	General Manager
Dr. Raymond Alfred	IOI Group Plantation Sustainability Manager, HQ
Mr. Bagus Kuncoro	Sustainability, Environment Health and Safety SNA Group
Ms. Alindra Gerald Sintik	IOI Group Plantation Sustainability Executive, HQ
Mr. Saturi Fatawi	Estate Manager PT KPAM Project

PT KPAM Management Plan comprises of at least 6 goals, as follows:

The management plan is developed in order to address 6 components/issues which is (i) Local Community Development; (ii) Pollution Control; (iii) Conservation of RTE and endemic species; (iv) Management of HCV and HCS area; (v) GHG Emission and Carbon Sequestration; and (vi) Landscape Management.

The following management plan goals is identified in order to address the above 6 issues.

Goal 1: Partnership with local community to manage PT. KPAM sustainably is established.

Goal 2: Sources of environmental pollution is reduced and managed sustainably.

Goal 3: Status of RTE and endemic species is determined and conservation measures is in place.

Goal 4: Key Habitat and other important ecosystem is managed and conserved sustainably.

Goal 5: GHG Emission and Carbon Sequestration is managed sustainably.

Goal 6: Landscape Management Committee is established to manage the HCVs at landscape level.

The following stakeholders was involved during the early stage of the assessment, most of them will be expected to become the members or stakeholders during the implementation of the Management Plan, which include

1. Government Officer In Charge of Environment and Agriculture: Forestry Service (Dinas Kehutanan, Agriculture and Plantation Service (Dinas Pertanian dan Perkebunan), Environmental Service (Badan Lingkungan Hidup/BLHD), and Police (Kepolisian Resort).
2. Local government representative at Kabupaten and Village Level: Representative of Kecamatan Manis Mata, Village head of Jambi and Sukaramai, and Representative of Kecamatan Kendawanan, Village Head of Danau Buntar and Dusun Tebing Tinggi.
3. Other adjacent stakeholders such as APP, BMJ and etc.
4. NGOs such as Aid Environment, GAIA and relevant Universiti (UNTAN).

5. Local community leader and other stakeholders from Danau Buntar, Jambi, and Sukaramai Village, and also Dusun Tebing Tinggi.
6. Plasma cooperative member and their representative.
7. RSPO to facilitate the certification process of PT. KPAM in the future.

Table 26 to Table 31 shows the implementation plan of the management plan covering 6 components as mentioned at the earlier paragraph of this page.

Table 26: Management Plan to achieve Goal 1
Partnership with local community to manage PT. KPAM sustainably is established

No	Objective(s)	Action(s)	Activities	Milestones	Indicators	Year 1	Year 2	Year 3
1.1	Zero dispute of Land	Transparent negotiation and transaction is established	Local Participatory Mapping (with FPIC approach) to identify resolution for any land disputes / conflict.	Local community mapping for all villages is conducted.	Reports and Mapping material.	X		
			Establish database on the land ownership within the PT. KPAM (if any)	Database on land ownership in KPAM is established	Number of conflicts or complaint is zero.	X		
			Establish a HUMAS Team within the community.	Humas Team is established		X		
			Compensation Scheme (CS) is agreed and developed together with the affected local communities.	CS is developed and implemented transparently.		X		
1.2	Zero conflict or argument with the local community	Ensure genuine exercise by local community of their right to Free and Prior Informed Consent (FPIC), whenever applicable	Adequate allocation of resources needs to consider not only consultation but also training and capacity building, technical supervision, multi-stakeholder engagement and coordination, monitoring, and the establishment of grievance processes, amongst other factors.	Relevant training has been provided and grievance processes is established.	Reports of the training and platform for grievance processes	X		
1.3	Development of Plasma Programme is accepted by the community (if any)	Get the feedback and endorsement from the local community on the Plasma Programme mechanism.	Plasma programme to be presented to the local community before its could be officially operated	Plasma Operated (whenever applicable)	Payment made to the local community	X		

1.4	Local community is given priority to work with the company.	Ensure that local community have been priority to get the working opportunities	Ensure the information of job vacancies is well disseminated within local communities. Communities with a right skill will be recruited	Recruitment of the local community to work in the plantation and conservation project.	Letter of appointment.	X		
1.5	Livelihood Quality of the local community is improved	Provide and implement suitable CSR project	Basic facilities are identified through community consultation and dialogue.	Basic facilities such as electricity, transportation and water supply is provided	Report of the CSR programme	X		
			Deliver the CSR programme based on the timeline that is agreed with the local community					X
1.6	Zero encroachment of the Peat area, Heath Forest, Buffer Zone, HCV1 and HCV3.	Local Community aware on the conservation and protection of the HCV1 and HCV3 areas	Outreach programme to socialize the guideline of HCV areas management and enhance their awareness to help protect and conserve the HCV1 and HCV3.	Outreach programme is conducted in all villages	Report of the outreach programme		X	
			Identify incentive scheme so promote local community to be involved in the Peat area, Heath Forest, Buffer Zone, Riparian Reserve, HCV1 and HCV3.	Incentive scheme to encourage local community to involved in conservation and protection plan is established	Payment receipt to the local communities		X	
1.7	Improve socio-economic of the local community	Zero opening of HCV5 management area	HCV5 Management area is determined and excised from the plantation development	Management plan for HCV5(MA) is developed. Refer to actions, milestones 4.1 and 4.2	Refer to indicators 4.1 and 4.2	X	X	
1.8	Role of Community in managing the HVC/HCS is determined at a landscape level	Refer to Action No 6.2	Refer to Activity No 6.2	Refer to Milestones No 6.2	Refer to Indicator No 6.2	X	X	

1.9	Option for alternative livelihood for the local communities is available	Identify alternative livelihood (i.e. REDD+)	Refer to Activity no 1.3	Refer to Milestone no 1.3	Refer to Indicator no 1.3	X	X	

Table 27: Management Plan to achieve Goal 2
Sources of environmental pollution is reduced and managed sustainably.

No	Objective(s)	Action(s)	Activities	Milestones	Indicators	Year 1	Year 2	Year 3
2.1	Reduce Air Pollution	Minimize the sources of the air pollution.	Limit the speed of the vehicle Maintain all vehicles to reduce gas emission.	Speed bump is constructed in a strategic place and vehicle is maintained regularly	Construction of speed bump and record of the vehicle maintenance.	X	X	X
2.2	Water Quality in the river is maintained based on government standard (PP No.82/2001)	Reduce the sources of water pollution.	Excise the high steep area from the plantation development / operation to reduce soil erosion	The usage of organic Pesticide	Report of monthly pesticide usage	X	X	
			Establish and conduct water quality monitoring (systematically);	Water quality station is established	Water Monitoring station	X	X	
			Promote the use of organic pesticide; and reduce the use of pesticide in the plantation	Plantation using 100% organic pesticide	Procurement receipt of the organic pesticide.	X	X	
			Protect the riparian reserve in order to reduce soil sedimentation (this is supported under Goal no 3, Action no 3.2)	All buffer zone and riparian reserve is protected	Refer to indicator(s) Action 3.2	X	X	
			Make sure all hazardous waste / liquid is managed proper	Management of hazardous waste / liquid is established	Waste Management plan	X	X	
2.3	Riparian Reserve of the Key River is protected and conserved.	Refer to Actions in 1.6, 3.2 and 4.3	Refer to activities in 1.6, 3.2 and 4.3	Refer to milestones in 1.6, 3.2 and 4.3	Refer to Indicators in 1.6, 3.2 and 4.3	X	X	
2.4	Zero contamination in Brais river and Jelai river.	Refer to Actions in 2.2	Refer to activities in 2.2	Refer to milestones in 2.2	Refer to Indicators in 2.2	X	X	

Table 28: Management Plan to achieve Goal 3

Status of RTE and endemic species (population / distribution) is determined & conservation measures is in place

No	Objective(s)	Action(s)	Activities	Milestones	Indicators	Year 1	Year 2	Year 3
3.1	Status of RTE Species is documented for monitoring purposes.	Monitor the presence of RTE and endemic species within the HCV areas and plantations concession periodically	Conduct baseline data for the RTE and endemic species through standard survey programme	Baseline data on RTE and endemic species is established	Report of the survey and monitoring programme.	X	X	
			Establish permanent plot or transect line to monitor of the presence / trend and status of RTE and endemic species	Permanent transect line is established	Monitoring report based on the permanent transect line	X	X	X
			Identify key habitat for keystone species such orangutan, proboscis, gibbon and other indicator(s) species (clouded leopard and sun bear)	Key habitat for keystone species is mapped	Survey and Mapping report in each of the forest habitat (HC1 and HCV3)	X	X	X
3.2	Zero hunting and illegal encroachment (logging) activities in the key habitat.	Effective Enforcement Programme using SMART Patrol is in place.	Recruit and train manpower to carry out the SMART Patrol programme	Effective SMART programme in place	Man powers and Equipment	X	X	
			Identify area that is prone to hunting and illegal felling of tree activities.	All conservation and protected area (containing HCV1) has been demarcated and signboard is in place.	Signboards are in place in all HCV1 area.	X	X	
			Conduct the patrolling activities systematically in the core areas for illegal hunting and felling of tree activities (and illegal collection of the <i>Nepenthes</i> species in the HCV areas)	Enforcement is implemented consistently	Reporting System (including month report)	X	X	X

Table 29: Management Plan to achieve Goal 4
Key Habitat and other important ecosystem is managed and conserved sustainably.

No	Objective(s)	Action(s)	Activities	Milestones	Indicators	Year 1	Year 2	Year 3
4.1	Management and conservation action of the degraded forest habitat (peat, buffer zone, key wildlife habitat (HCV1 and HCV3) is established.	Determine which area to be rehabilitated and conduct tree planting in the determined areas.	Identify and Map the degraded forest / habitat using LIDAR Data, and prepare work plan to rehabilitate the degraded areas.	Degraded habitat is determined and warplane for each degraded area is developed	Map and work plan	X		
			Setup tree seedling (indigenous and local species) nursery to cater forest rehabilitation programme	Nursery is established	Nursery and tree seedling	X	X	X
			Tree planting conducted in a degraded areas such as peat, buffer zone, key wildlife habitat (HCV1 and HCV3)	Tree planting is initiated based on the work plan	Reports and relevant photos	X	X	X
			Record the mortality of the planted tree seedling (using plot sampling) to monitor the performance and effectiveness of the tree planting programme	Mortality rate for the tree planting in each forest type/condition is documented	Report of mortality rate.	X	X	X
4.2	Reduce the threat of the HCV areas	All HCV areas is excised from any plantation development. (especially HCV 1 – Forest habitat in Sg Berais, Sg. Kapat and Sg habitat for orangutan and proboscis monkey.	Minimize roads and bridge development around riparian forests and peat forests.	Road and Bridge development plan	Development Plan	X		
			No canals development inside the riparian forests and peat forests	Riparian reserve and peat forest is not encroached	Report and Photos	X		
			Develop mitigation measures to reduce the impact of current road, bridges & canals that has been established earlier in the key habitat.	Mitigation measures is developed and implemented	Monitoring Report of the mitigation measures		X	X
4.3	Management of forest / land fires is in place	Forest or land fires can be prevented, detected and	Prohibit all types of community activities (i.e. hunting, fisheries and cultivation), in PT. KPAM	Warning signboard is in place.	Signboard on the ground	X	X	X

		controlled with proper coordination	area especially in areas of Peat area, Heath Forest, Buffer Zone, Riparian Reserve, HCV1 & HCV3.					
			Establish and train the fire prevention & control team	Training is provided consistently.	Report of the training	X	X	X
			Develop early fire detection system	Fire detection system is established	Fire detection monthly report	X	X	X
			Identify and establish fire breaker on the ground	Fire breaker on the ground is mapped	Report and photo	X		
			Develop partnership with adjacent stakeholders to manage land/forest fire at landscape level approach.	MOU or MOA with adjacent stakeholders is established	MOU or MOA	X	X	
			Develop SOP for Rapid Response	SOP is well known by all staffs/workers	SOP	X		

Table 30: Management Plan to achieve Goal 5
GHG Emission and Carbon Sequestration is managed sustainably.

No	Objective(s)	Action(s)	Activities	Milestones	Indicators	Year 1	Year 2	Year 3
5.1	Reduce GHG Emission from peat land limit to zero Note: the current average GHG emission baseline is estimated 19.63 ton CO ₂ e/ha/yr"	Establish water management plans around peat and riparian forest areas that can ensure their ecosystem function sustainability. Water level in peat area is managed properly	Using DTM (Digital Elevation Model), identify water flow pattern in the peat.	Water flow pattern (especially in peat area is established)	GIS spatial modeling	X	X	X
			Establish Water Monitoring Level Programme based on the water flow pattern	Adequate Station for Water Monitoring Level in peat ecosystem is established	Water Monitoring station	X	X	X
			Establish suitable water gate in the peat ecosystem and develop SOP for water gate operation mechanism	Strategic water gate is established to manage the water level	Water Gate station	X	X	X
			Conduct water monitoring level and implement water gate operation based on the established SOP	Fully operation of water monitoring system is in place	Monthly report	X	X	X
		GHG Emission Mitigation Measures is implemented accordance with the plan.	Develop policies and implement procedures of land clearing for oil palm plantations with low emissions	Policies and procedures of land clearing with low emissions is in place before the clearing can be started	Maps and Reports	X	X	X
			Develop policies and implement procedures to monitor GHG emission management or reductions and carbon credits in POME waste management, methane capture, EFB and kernel, transportation and consumption of fuels.	Policies and procedures to monitor GHG emission management and reduction is in place.	Reports and SOPs	X	X	X

5.2	Increase the growth and productivity of oil palm plantations to increase carbon sequestration	Study the environmental parameters that can enhance the growth of oil palm trees and production of oil palm fruit.	Identify organic pesticide and nutrient that needed in different estate to enhance the growth of oil palm trees and production of oil palm fruit.	Organic pesticide and nutrient that needed in different estate is defined and estimated before implementation.	Maps and Reports	X	X	X
5.3	Zero clearance of the High Carbon Stock areas.	HCV1, HCV3 and HCV4 Conservation areas, including areas that overlaying peat land (>300 cm only) and carbon stock from AGB > 40 ton C/ha within PT KPAM	HCV1, HCV3 and HCV4 Conservation areas, including areas that overlaying peat land (>300 cm only) is demarcated in the ground and management plan (conservation and protection programme) is implemented. Refer to activity no 3.2, 4.1, 4.2 and 4.3	Refer to milestones no 3.2, 4.1, 4.2 and 4.3	Maps and Progress Reports	X	X	X

Table 31: Management Plan to achieve Goal 6
Landscape Management Committee is established to manage the HCVs at landscape level.

No	Objective(s)	Action(s)	Activities	Milestones	Indicators	Year 1	Year 2	Year 3
6.1	Long-term and short term of the Landscape Management Approach is identified	Policy Direction document (for the "Landscape Management Approach" is developed	Prepare Policy Direction Document for the Landscape Management Approach	Policy Direction Document t is agreed by key stakeholders	Policy Direction Document (including relevant maps)	X		
6.2	Landscape Management Approach is supported by key stakeholders	Identify key stakeholders and define their role and fund to implement the	Develop scope of work for (i) Protection, (ii) Rehabilitation, (iii) Securing Corridor for HCV and HCS; (iv) Community Development Programme (v) Fire Prevention, Control and Rapid Response Programme; (vii) Water zonation management and water/riverine catchment management.	Standard management measures and reporting system is established based on the scope of work.	Minutes of Meetings	X		
6.3	Implementation and of the "Landscape Management Approach" Plan	MOU to manage the Landscape Management Approach is developed and signed	Scope of work, funding mechanism, standard reporting and monitoring system is presented and agreed by all stakeholders (members of the Landscape Management Approach)	MOU is signed before implementation on the ground	MOU and quarterly report	X		
6.4	Ecological corridors for all HCV / HCS is secured and managed sustainably.	All key stakeholders agree to re-establish the key ecological corridor connecting all the HCV/HCS at a landscape level	Each of the stakeholders Identify key ecological corridor connecting all the HCV/HCS	Map showing all the HCV/HCS, buffer zones, riparian reserves, peat forest and heath forest, including key corridor is established	Map and action plan to secure and manage the key ecological corridor	X		

6.5	Implementation a forest monitoring and prevention at a landscape level.	Platform to share information and manage forest /land fire is established at a landscape level	Each of the stakeholders Identify key area / hotspot for fires and develop rapid response programme that is supported by all stakeholders	Map showing forest / land fire hotspot and rapid response SOP	Rapid Response document, SOP and monthly reporting.		X	X
6.6	Implementation a water level and quality monitoring at a landscape level.	Platform to share information and manage water and riverine ecosystem is established at a landscape level	Each of the stakeholders Identify key area / hotspot for potential water/riverine pollution and solution to monitor and address the threat.	Water Zonation management and riverine ecosystem management plan at a landscape level is established	Water Zonation management and riverine ecosystem management plan		X	X



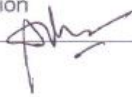
5. INTERNAL RESPONSIBILITY

5. INTERNAL RESPONSIBILITY

This document is the summary of assessment result on Environment Impact Assessment (EIA), Social Impact Assessment (SIA), High Conservation Value (HCV), Land Use Change Analysis (LUCA) and High Carbon Stock (HCS) in PT KPAM – Kalimantan, Indonesia and has been approved by the Management of PT KPAM:

<p>Sign on behalf SEIA Assessor</p>   <p>Name: Derry Yulianto S Hut Position: Lead Of Assesor SEIA Date: 18/01/2018</p>	<p>Sign on behalf HCV Assessor</p>   <p>Name: Idung Risdiyanto Position: Provisionally Licensed Assessor (ALS150291R) Date: 12/01/2018</p>
<p>Sign on behalf SEIA Assessor</p>   <p>Name: Eva Aprilia M.E Position: Socio_Economy Assesor of SEIA Date: 18/01/2018</p>	

The Assessment Result of the High Conservation Value (HCV) and Social Environmental Impact (SEIA) Assessment of PT KPAM by Aksenta will be applied as part of the guidelines in developing and managing PT KPAM.

<p>Sign on behalf PT KPAM</p>   <p>Name: Tan Kim Ha Position: Act. Head Of Plantation Date: 18/1/2018</p> 

The implementation of the management and mitigation plan will be carried out, to follow each of the proposed management plan as shown in Table 26, 27, 28, 29, 30 and 31.



Dr. Raymond Alfred
Sustainability Manager
Malaysia & Indonesia

6.0 REFERENCES

- SIA Assessment Report: SIA Assessment of PT Kalimantan Prima Agro Mandiri, dated October 2015. Conducted and prepared by Aksenta, Jakarta, Indonesia.
- HCV Assessment Report: HCV Assessment of PT Kalimantan Prima Agro Mandiri, dated October 2015. Conducted and prepared by Aksenta, Jakarta, Indonesia.
- HCV Delineation and Verification Report: HCV verification and delineation of PT Kalimantan Prima Agro Mandiri June 2016. Conducted and prepared by Aksenta, Jakarta, Indonesia.
- Carbon Stock Assessment report of PT Kalimantan Prima Agro Mandiri, dated October 2015. Conducted and prepared by Aksenta, Jakarta, Indonesia.
- High Carbon Stock Assessment Report of PT Kalimantan Prima Agro Mandiri, dated August 2016. Conducted and prepared by Aksenta, Jakarta, Indonesia.
- LUC (Land Used Change) Analysis Report of PT Kalimantan Prima Agro Mandiri, dated October 2015. Conducted and prepared by Aksenta, Jakarta, Indonesia.
- Soil survey and Suitability assessment report of PT Kalimantan Prima Agro Mandiri in Kabupaten Ketapang, West Kalimantan Province, Indonesia. By Idung Risdiyanto and Aulia Bahadhori Mukti, dated September 2016.
- Tax Notification Number, No. 02.596.768.8 – 703.000.
- Company Registration (Tanda Daftar Perusahaan-TDP), 09.03.1.46.52630, exp: 4 Juni 2017.
- Permitted Area-Izin Lokasi, Decision of Regent Ketapang with SK No. 365/2007, dated of issue 24th September 2007 by Regent Ketapang with total area 20.000 ha.
- Extension of permitted area –Perpanjangan IjinLokasi, SK No. 416/2010, dated of issue on 27th July 2010 by Regent Ketapang (± 11.000 ha).
- Certificate letter from Regent Ketapang No.100/1193/PEM, regarding recommendation permit PT Kalimantan Prima Agro Mandiri.
- EIA approval based on Regent certificated letter No.100/1193/PEM, regarding recommendation permits PT Kalimantan Prima Agro Mandiri.
- Decision of the head of the local environment agency head of West Kalimantan province, as chairman of chief appraiser SEIA No.12 Year 2015.
- Plantation Business Permit - Izin Usaha Perkebunan, SK No. 772/Disbun-D/2015, issued dated on 27 November 2015 by Pj. Regent Ketapang (± 11.000 ha and mill capacity : 40 ton TBS/hour)
- Extension of permitted area (Ijin lokasi) 1507/DPMPPTSP-D/2017 date 18 December 2017 by West Kalimantan Governor.
- Environment feasibility permit No.715/KLH-B/2015, date of issued on 28 October 2015 by Pj. Regent Ketapang.
- Environmental Permit regarding plantation activity No.742/KLH-B/2015, date of issue 3 November 2015 by Pj. Regent Ketapang.
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