Roundtable on Sustainable Palm Oil
New Planting Procedure
Summary of Assessment Report and Management Plan

PT PALMA AGRO LESTARI JAYA

Ketungau Tengah Sub District, Sintang District, West Kalimantan Indonesia

Prepared by :
PT Palma Agro Lestari Jaya

October 2018

CHAPTER 1. OVERVIEW AND BACKGROUND

1.1. Area of New Planting and Development Plan

PT. Palma Agro Lestari Jaya (PT. PALJ) is one of the national oil palm plantations under PT. Genting Plantations Nusantara. Administratively, the company is located in Ketungau Tengah District, Sintang Regency, West Kalimantan Province. In its operations, the company has obtained permission from the Sintang Regent No. 525/91/KEP-PERTANAHAN/2013 which consists of 2 blocks, namely Block I (5,500 ha) and Block II (13,900 ha) in the District of Ketungau Tengah and Ketungai Hilir. However, due to efficiency reasons in the framework of acceleration and consideration of designation capabilities, PT. PALJ proposed a revision to the Sintang Regent. The revision of the area was given by the Sintang Regent through the Regent's No. 525/945/KEP-Pertanahan/2013. Based on the decree, the extent of PT. PALJ is ± 13,900 Ha located in the Ketungau Tengah District (**Figure 1** and **Figure 2**).

After obtaining a location permit, an AMDAL study was conducted, lead by Tri Rima Setyawati, S.Si., M.Sc., HCV assessment at PT. PALJ is lead by Mr. Kresno Dwi Santosa who has been accredited by the RSPO HCV and owns Asssessor Licensing Scheme or ALS from HCV Resource Network Assessor Licensing Scheme (HCVRN-ALS). Assessment Social Imapct Assessment (SIA) lead by Sigit Pamungkas, Sp., M.Si. Assessment Land Use Change and Carbon Stock Analysis lead by Kasuma Wijaya, S.Hut., M.Si. registered CSA Approach Practitioners.

In the plantation development plan, PT PALJ places importance and care for environmental conservation. This effort is contained in the policy of non-burning land clearing and avoiding new development on peatlands, areas with high carbon stocks, and is committed to conserving areas with High Conservation Value (HCV). Based on the 2016-2036 Sintang Regency Spatial Plan Map, that is other use areas and settlement areas (Figure 3).

The Land cover of PT PALJ concession area based on HCV Assessment presented consist of 1). Secondary forest, 2). Rubber plantation, 3). Old shrubs and 4).Mixed dryland farming. The Disturbed Forest (Secondary Forest) in concession PT PALJ have been protected as HCV Area (presented on Figure 24) and further information about HCV presented at Table 13.

PT PALJ has a new planting plan for oil plantation from 2019 - 2022, that potentially area for new planting are 9.576,96 Ha (Recommendation for development), the details are as follows : 2019 (3.109,68 Ha), 2020 (2.630,47 Ha), 2021 (2.509,88 Ha) and 2022 (1.326,93 Ha), (presented on Figure 32)

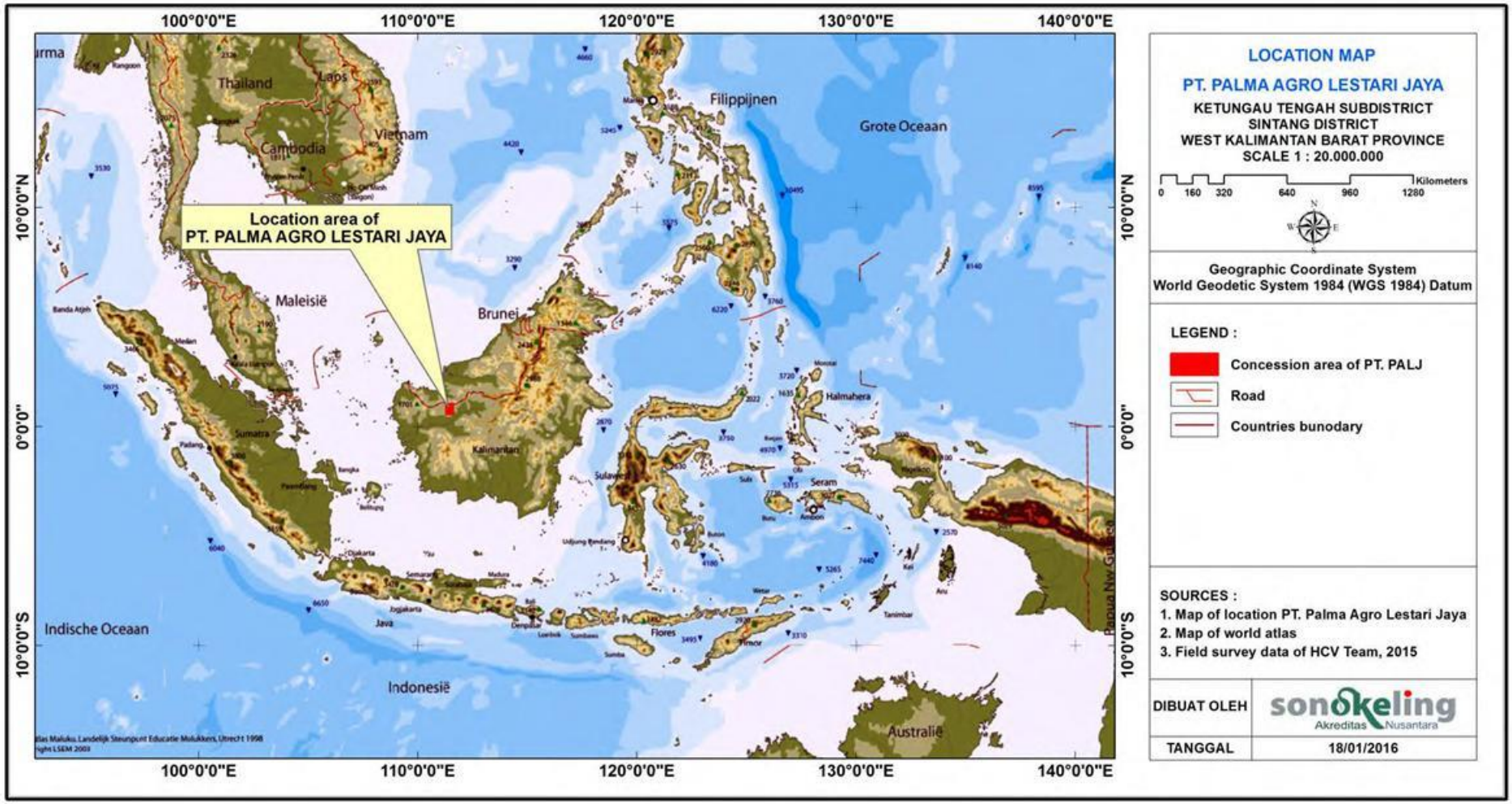


Figure 1. Map of Location permit area of PT PALJ in Indonesia

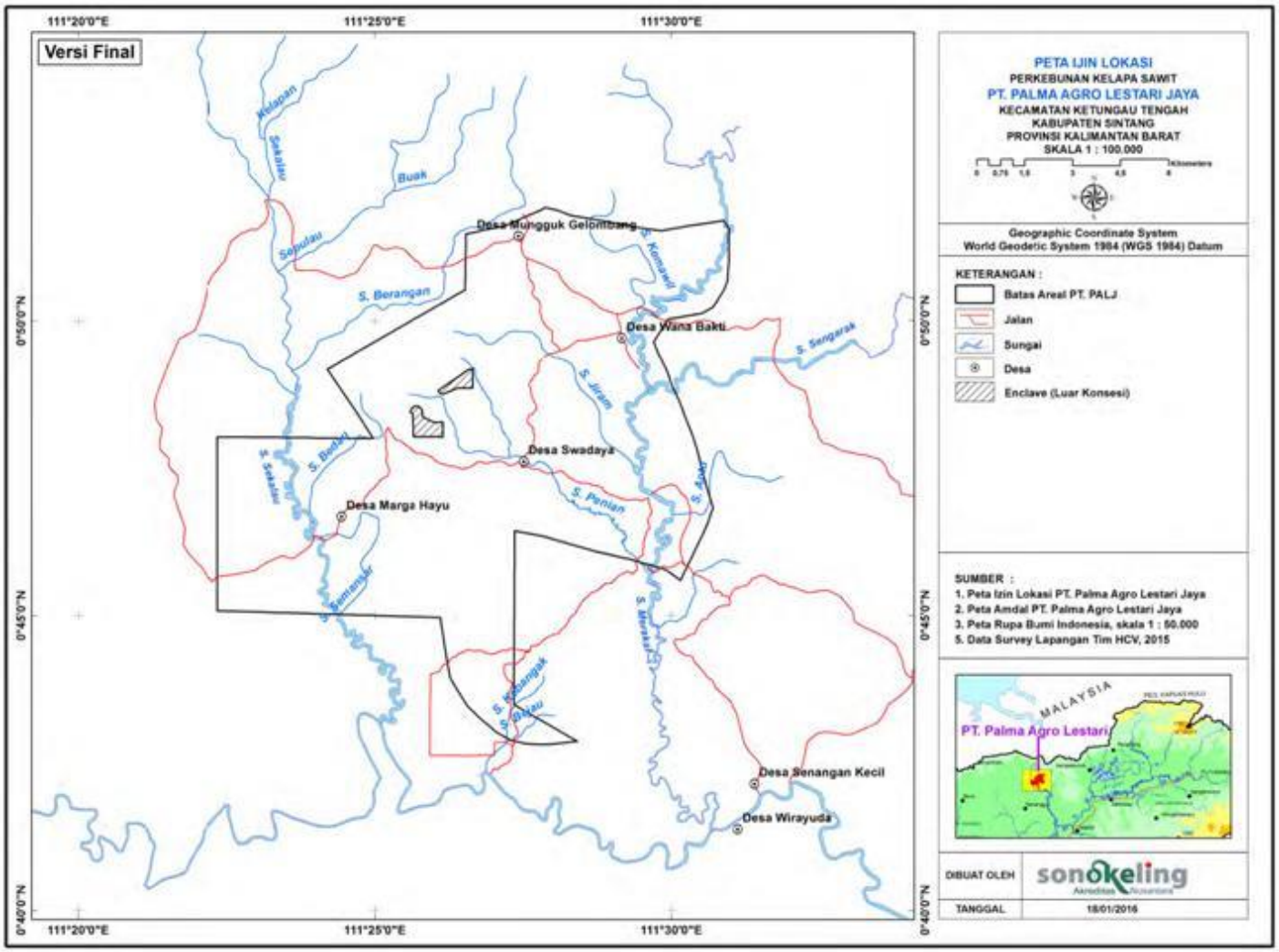


Figure 2. Map of Permit Area PT. PALJ

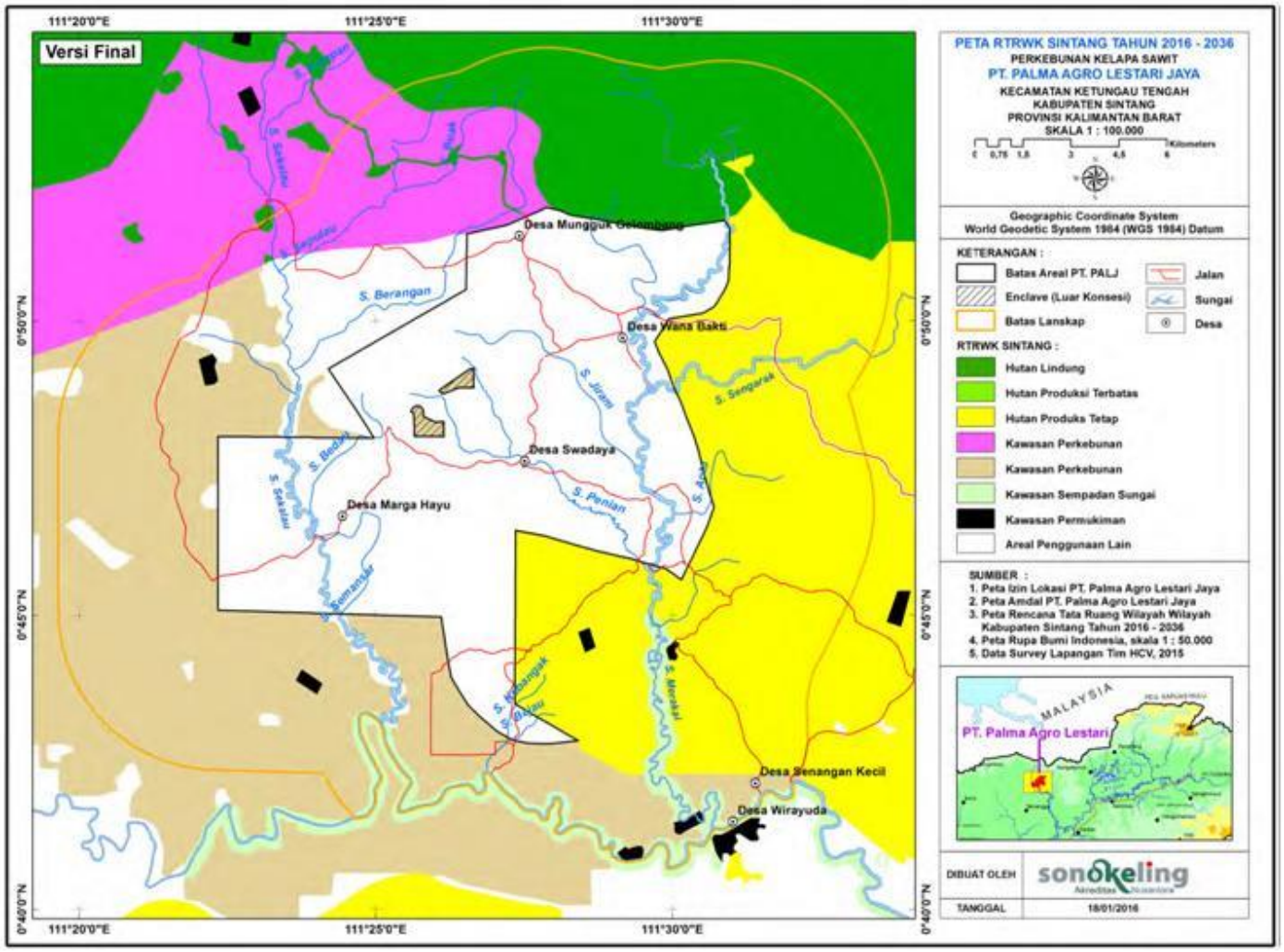


Figure 3. PT PALJ's permit area is in the 2016-2036 Sintang Regency Spatial Planning Map

1.2. Landsystem and Soil

Based on the Land System map (RePPProT, 1988), land systems that composed the at the landscape scale of the assessment boundary and within location permit area of PT PALJ is presented in **Table 1 Figure 4**. As for the type of soil that is found both at the landcape assessment boundary and within permit area of PALJ is presented in **Table 2 Figure 5**. The soil types that dominate the location permit area indicate the species that are sensitive to erosion.

Table 1. Land system that composed at the Landscape Assessment Boundary and within Permit Area of PT PALJ

Land system	Litologi	Permit Area	Outside of Permit Area (Ha)	Landscape Boundary (Ha)
Beliti	Alluvium-recent riverine (fresh); Peat	375,75	13.824,23	14.199,98
Beriwit	Sandstone	0	3.351,07	3.351,07
Lawanguwang	Shale Mudstone Sandstone; Alluvium, recent riverine (fresh)	11.008,25	14.709,87	25.718,12
Mendawai	Peat	0	1857,86	1.857,86
Pendreh	Sandstone Conglomerate shale	1.085,75	351,12	1.436,87
Teweh	Sandstone Shale Mudstone Marl	1.430,25	2.491,27	3.921,52
Grand Total		**13.900,00**	**36.585,42**	**50.485,42**

Table 2. Soil Type Formation that composed at the Landscape Assessment Boundary and within Permit Area of PT PALJ

Soil Type	Permit Area	Outside of the Permit Area	Landscape Boundary
Alluvial	808,43	257,55	1.065,98
Podzolic Red Yellow	12.344,33	35.782,01	48.126,34
Podzol	747,24	545,85	1.293,09
TOTAL	**13.900,00**	**36.585,42**	**50.485,42**

1.3. Slope

The concession area of PT PALJ is in the lowlands with a height of 36 to 324 meters above sea level. The slope classes that composed both at the landscape scale of the HCV assessment boundary, as well as within location permit scale are 5 (five) slope classes, as presented in **Table 3 Figure 6**. In addition, based on the Erosion Hazard Level (TBE) calculation in the area, potential heavy erosion hazard - very heavy ie hilly area with a slope classes above of D and E.

Table 3. Slope Classes that Composed at the Landcape and Permit Area of PT PALJ Levels

Slope Classes	Permit Area (ha)	Outside of Permit Area (Ha)	Wider Landscape (Ha)
A	11.648,23	25.784,25	37.432,48
B	1.655,93	6.123,31	7.779,24
C	67,31	741,52	808,82
D	82,75	2.740,23	2.822,98
E	445,78	1.196,10	1.641,88
TOTAL	**13.900,00**	**36.585,42**	**50.485,42**

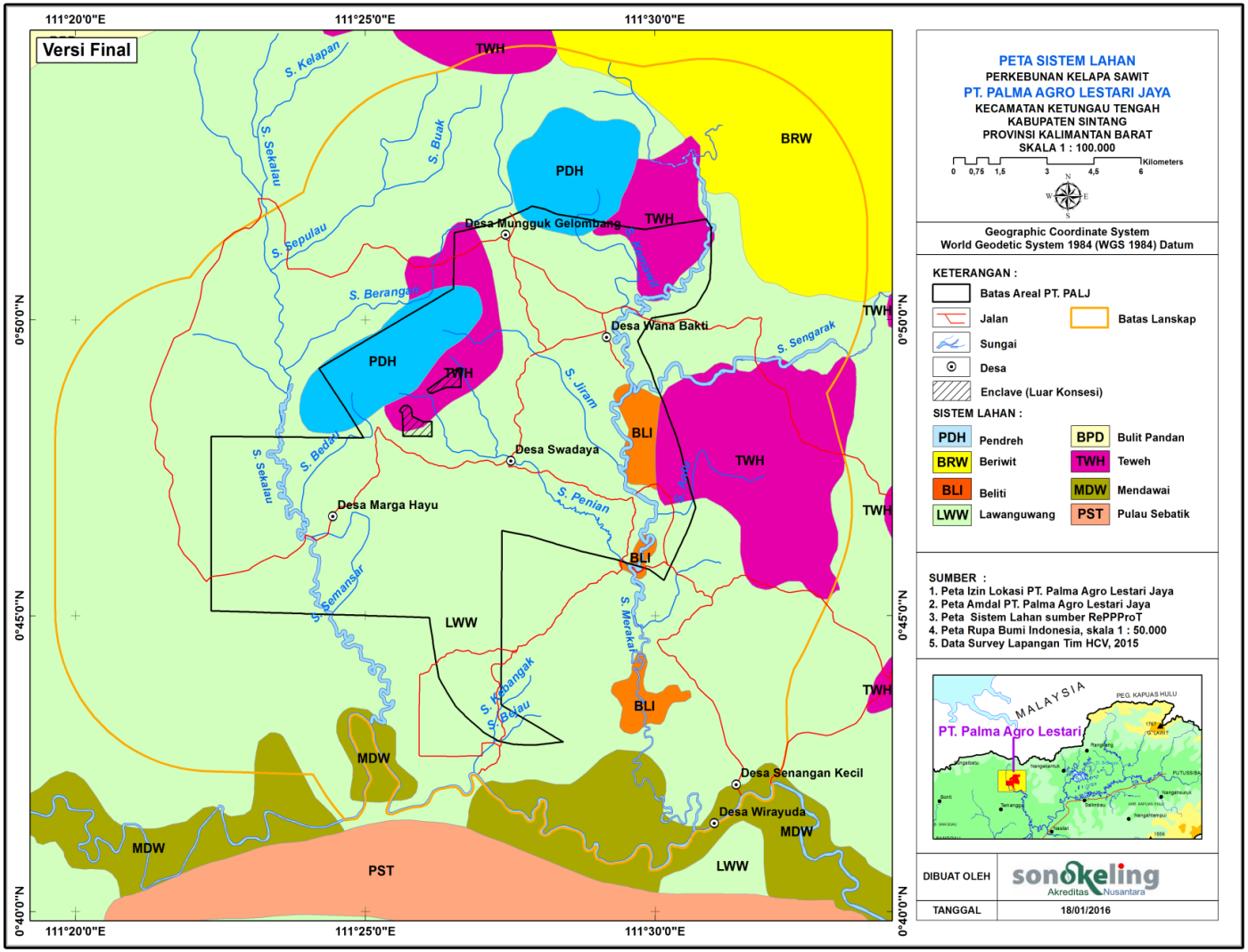


Figure 4. Land System that Arranges Boundary Landscape Areas for HCV Assessments and PT PALJ Location Permits

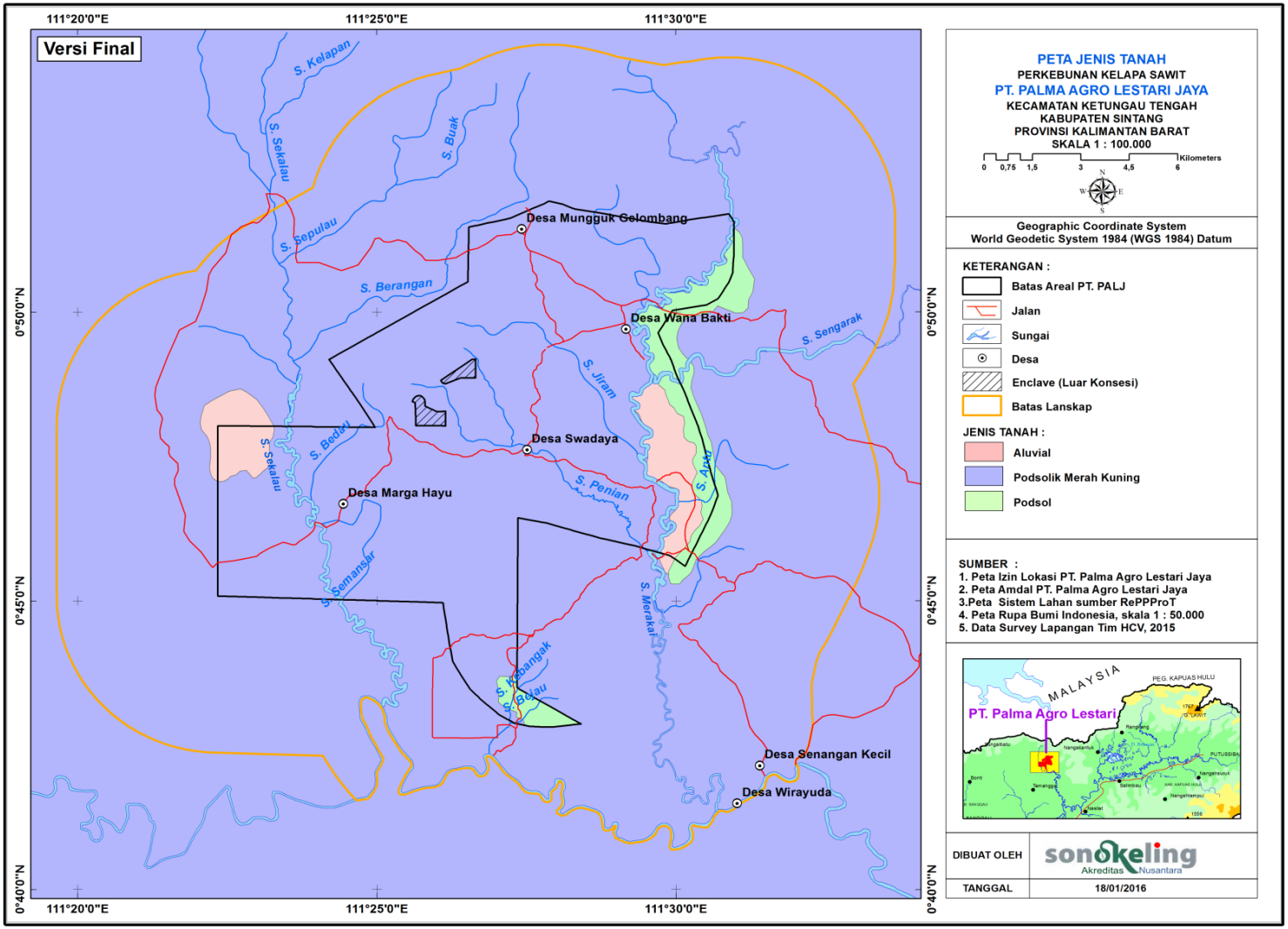


Figure 5. Types of Land that Compose Landscape Limits HCV assessments and PT PALJ's Location Permit Areas

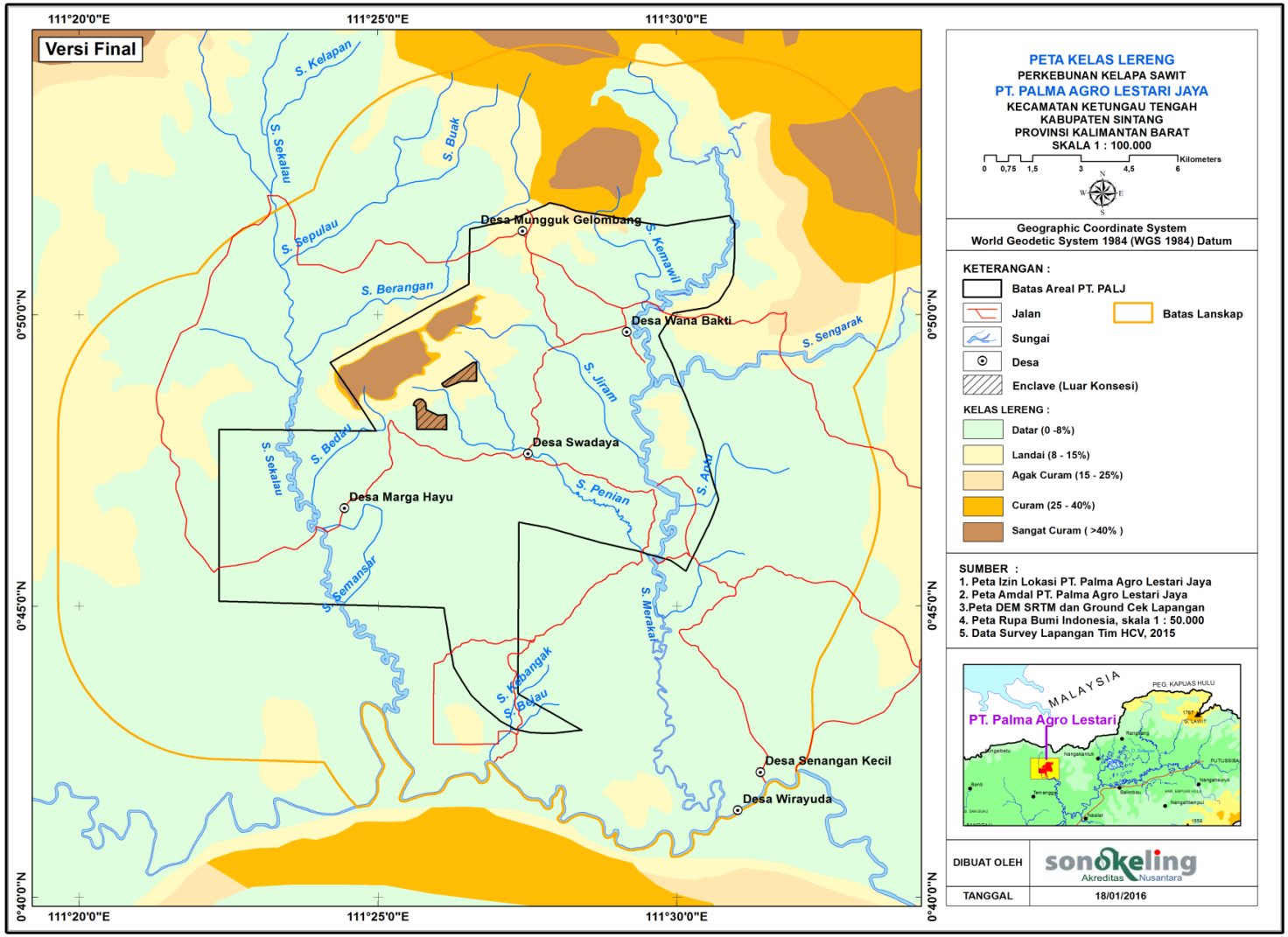


Figure 6. Slope classes with Landscape Limits for HCV Assessments and PT PALJ Location Permit Areas

CHAPTER 2. ASSESSMENT PROCESS AND METHODS

2.1. SEIA Assessment

a. Assessor Credentials

1) AMDAL (Environtment Impact Assesment) conducted by : Tri Rima Setyawati, S.Si., M.Si and Teams

   Addres : Jl. Sei Raya Dalam Komplek Mitra Indah Utama 3 Blok D-11 Pontianak, West Kalimantan.

   Composition team :

Leader	: Tri Rima Setyawati, S.Si., M.Si
Member	: Riyandi, M.Si. and Endang Mulyadi, M.Si.
GeoPhysical and Chemistry	: Eta Fanani AR, S.Hut.,
Biology	: Leonardus Silvester, S.Si.
Social, Economic and Cultural	: Aris Bahariyono, S.Si.
Public Health	: Muhammad Adam, SKM

2) SIA (Social Impact Assessment) conducted by : by Sigit Pamungkas, M.Si.

b. Methods

The SEIA study was conducted on September 2014 and and was reviewed in October 2018. SIA study was conducted on Oktober 2018. SIA Document was conducted 2018 is a update SIA document conducted 2015. Village Assessment including : Wanabakti, Swadaya, Margahayu, Gelombang, Senangan Kecil and Wirayuda on Ketungau Tengah Sub District, Sintang District, West Kalimantan Province.

Methods of data collection and excavation were carried out by the Rapid Rural Assessment (RRA) technique that combined in-depth interviews, Focus Group Discussion (FGD), and observation. In order to ensure the validity of the information, the principle of triangulation (multiple data sources) and data saturation (no more changes in the data collected) is used in the renewal of this SIA document.

The method used in the review process consists of :

1) Literature review; done by collecting and studying related documents to gain an understanding of the social and environmental context of the identification area. Documents are obtained from study villages such as village profiles, RPJMDes, kecamatan BPS or District BPS in Figures, previous SIA Reports, and other sources
2) Discussion / Dialogue; this method is used to identify the parties by involving local leaders, local government officials and other parties who are considered

competent on the social and economic issues of the culture of the community, exploring hopes, ideas and aspirations to get solutions to the issues that occur, carried out through meetings both formal and non-formal and with specific topics (Focus Group Discussion).

3) Field observation; this method is used to directly understand the facts of the field which is an indication of the occurrence of social issues and impacts that occur and to visually ascertain the extent of the impact of the planned oil palm plantation development on both positive and negative impacts.
4) Indepth Interview; conducted in-depth interviews with selected key figures who were respondents. Interviews were conducted with residents / community and community leaders (Village Heads, Neighborhood Association Heads, BPDs, LPMs, leaders of local institutions, and traditional leaders)
5) Triangulation; the methods above are carried out in an integrated manner to verify each other on issues, opinions, and ideas that arise.
6) Social-Learning Cycle; SIA study is not a one-time linear process but a cyclical process, which functions as social learning processes to respond to environmental changes that occur

The analysis phase is carried out in the form of a series of discussions, both formal and informal. The results are then presented back to the Management Unit for input and improvement.

To make it easier to analyze the data that has been collected, an analysis framework is created. This analytical framework is used to describe the process of analyzing the data on the social impact assessment in the PT PALJ concession area on the social environment components of the communities living around the area. Components of activities that influence the components of the social environment can have positive and negative impacts. From the impacts that have both positive and negative impacts, social governance or social management models are then formulated

2.2. HCV Assessment

a. Assessor Credentials

HCV Assessment was conducted by : PT Sonokeling Akreditas Nusantara
Address: KP Selagalih RT 02/08 Ciomas Rahayu, Ciomas, Bogor, West Jawa-Indonesia
Telpon/Fax : 0251-8328530
Email : ksantoso_68@yahoo.com

Table 4. Composition Team HCV Assessment

Name	ALS Licence	Institution	Role	Expertise
Ir. Kresno Dwi Santosa, MSi ksantosa_68@yahoo.com	Provisionally (ALS15009KS)	PT. SAN	Team Leader/Social Economic and Cultural Aspects (HCV 5 & 6)	Social Science and Natural Resources Management
Ir. Siswoyo, MSi Siswoyo65@yahoo.com	Provisionally (ALS151010SS)	PT. SAN	Team member/ Biodiversity Aspects (HCV1, 2 dan 3)	Biodiversity, Botanist, Forest Ecology and Conservation
Dr. Ir. Rachmad Hermawan MSc.F	N/A	PT. SAN	Team member/Ecosystem Services aspect (HCV 4)	Ecosystem Services, Hidrologist
Kasuma Wijaya, S.Hut, M.Si kasuma_wijaya@yahoo.com	N/A	PT. SAN	Team member/Ecosystem services aspect (NKT4)	Landscape and GIS
Sigit Pamungkas, M.Si.	N/A	PT. SAN	Team member/Social Economic and Cultural Aspects (HCV 5 & 6)	Social Forestry and Social Economic
Rahman Fero Balfas, A.Md vero_balfas@yahoo.com	N/A	PT. SAN	Team member/ Biodiversity Aspects (HCV1, 2 dan 3)	Biodiversity and Fauna inventory
Hendi Kusnadi Kusnadi.bgr@gmail.com	N/A	PT. SAN	Team member mapping and GIS	GIS and Spatial Planning
Zulkifli Hasibuan, A.Md zulkiflinasution10@gmail.com	N/A	PT. SAN	Junior team member/Ecosystem Services	Hidrologist

b. Methods

1) Time of HCV assessment

HCV Assessment in the location permit area of PT PALJ, was completed on 5 (five) months, from October 2015 to February 2016. Field survey was conducted during 9 (nine) days from 11 – 19 November 2015. Prior to HCV assessment implemented, the management of PT PALJ conducted a due diligence study on April 4 - 8, 2015, which involves the Team Leader of the current HCV assessment. The HCV Assessment process are presented in **Table 5**.

Table 5. Steps and timeline for completion of the HCV Process

No.	Step Description	Time Undertaken
A.	**Pre-Assessment Phase**	
1	Scoping study (due diligence process)	04 – 08 April 2015
2	Information Exchange	First week October 2015
3	Tier Rating	First week October 2015
4	Information collection	Third week October 2015
5	Scoping Study, Analysis and Initial Mapping	Third week October 2015
6	Preparation and Planning	Fourth week October 2015
B.	**Assessment Phase**	
1	**HCV Identification**	
a.	Field Data Collection	
	• Opening Meeting	12 November 2015
	• Primary Data Collection and participatory mapping	12 -15 November 2015
	• Recapitulation and Analysis of the data, Interpretation and Mapping of field findings	15-16 November 2015
	• Closing Meeting	16 November 2015
	• Direct Stakeholders Consultation	17 November 2015
2	Findings and Recommendation	November 2015
3	Reporting	November – December 2015
4	Stakeholder Consultation through FGD	30 December 2015 – 3 January 2016
4	Peer Review	10 January 2016
5	Report Completion	January – February 2016
6	Submited ke Quality Panel HCV-RN	September 2017

2) Secondary data collection

Secondary Data Types

Table 6. Description of Secondary Data's in the HCV Assessment of PT PALJ

HCV	Sources of main data and information	Year
HCV 1	Map of location permit area of PT PALJ	2013
	Map of Forests Tertory and Waters Bodies, West Kalimantan Province, scale 1 : 250,000 (MoF Decree No. 733/Menhut-II/2014, 2 September 2014).	2014
	Map of Spatial Planning of West Kalimantan Province , 2007	2007
	Sintang District Spatial Planning 2016-2036	2016
	Government Regulation No. 7 of 1999	1999
	Landsat Imagery 8 OLI Band 654 Path/Row 120/59 ETM Satelite images covered 2014 and 2015	2015
	IUCN Red List of Threatened Species. www.iucnredlist.org	2015
	Appendices I and II,	2015
	Vegetation - Tantra, *et al.*	1990
	Mammals : Payne, *et al.*	2000
	Birds : MacKinnon *et al.*	1992, 2010
	Herpetofauna : Sardi *et al.*	2013
	Map of orangutan distribution, Forum Orang Utan Indonesia (http://forina.or.id)	2014
	Map of orangutan distribution, IUCN (Sange *et al.* 2016)	2016
	Map of IBA (Important Bird Area), Birdlife Internasional	2004
	Map of EBA (Endemic Bird Area), Birdlife Internasional	2004
	Report of Environmental Impacts Assessment of PT PALJ	2013
	Report of PT PALJ Planning Division	2014
HCV 2	Map of location permit area of PT PALJ	2013
	Map of Forest and Waters Area West Kalimantan Province , scale 1 : 250,000 (MoF Decree No. 733/Menhut-II/2014, 2 September 2014).	2014
	Map of Spatial Planning of West Kalimantan Province	2007
	Sintang District Spatial Planning 2016-2036	2016
	Landsat Imagery 8 OLI Band 654 Path/Row 120/59 ETM Satelite images covered 2014 and 2015	2015
	Ecosystem : RePProt	1987

HCV	Sources of main data and information	Year
	Map of Kalimantan ecoregion (Ministry of Environment 2013)	2013
	Map of Intact Forest Lanscapes (IFLs) (www.intactforests.org).	2013
	Map of orangutan distribution, Forum Orang Utan Indonesia http://forina.or.id)	2014
	Map of orangutan distribution, IUCN	2015
	Map of IBA (Important Bird Area), Birdlife Internasional	2004
	Map of EBA (Endemic Bird Area), Birdlife Internasional	2004
	Report of Environmental Impacts Assessment of PT PALJ	2013
HCV 3	Map of Location permit area of PT PALJ	2013
	Map of Ecosystem types : RePProt	1987
	Landsat Imagery 8 OLI Band 654 Path/Row 120/59 ETM Satelite images covered 2014 and 2015	2015
	Land System : RePProt	1987
	Biophysiographic map of Kalimantan	1997
	Map of Kalimantan ecoregion (Ministry of Environment 2013)	2013
	Map of Rare Ecosystem (www.iucnrle.org.)	2013-2015
	Map of Intact Forest Landscapes (IFLs) (www.intactforests.org)	2013
	Report of Environmental Impacts Assessment of PT PALJ	2013
HCV 4	Map of Location permit area of PT PALJ	2013
	Land system : RePProt	1987
	Map of Watershed of West Kalimantan Province	-
	Landsat Imagery 8 OLI Band 654 Path/Row 120/60 ETM Satelite images	2015
	River network : DEM SRTM 90 m USGS NASA	2014
	Slope : DEM SRTM 90 m USGS NASA	2014
	Indonesia topographic map, Geospatial Information Agency	1998
	Map of hot spot distribution, https://firms.modaps.eosdis.nasa.gov	2015
	Climate & Rainfall : Climatology Station Flood Control and Coastal Observation Project, Directorat General Natural Water Resources, West Kalimantan and Climatology station of Susilo Airport, SIntang, West Kalimantan	2005-2014
	Report of Environmental Impacts Assessment	2013
HCV 5	Map of Location permit area of PT PALJ	2013
	Sintang Regency in figures 2015, BPS of Sintang regency	2015
	Ketungau Tengah in figures 2015, BPS of Sintang regency	2015
	Report of Social Impact Assessment, which is produced together in parallel with HCV assessment.	2015
	Report of Environmental Impact Assessment of PT PALJ	2015
	Map of Ethnic distribution in Kalimantan Island (http://www.ethnologue.com/)	2016
HCV 6	Map of Location permit area PT PALJ	2013
	Sintang Regency in figures 2015, BPS of Sintang regency	2015
	Ketungau Tengah in figures 2015, BPS of Sintang regency	2015
	Report of Social Impact Assessment, which is produced together in parallel with HCV assessment.	2015
	Report of Environmental Impact Assessment of PT PALJ	2013
	Map of Ethnic distribution in Kalimantan Island (http://www.ethnologue.com/)	2016
	Map of World Heritage Sites UNESCO	2009

Secondary Data Analysis

Species data's

The species data are required for HCV 1 and 2 assessments. Potential species data are found in the location of permit area PT PALJ which was extracted from various sources (Vegetation - Tantra, et al., 1990; Mammals - Payne, et al. 2000; Birds - MacKinnon et.al., 1992 and 2010; and Herpetofauna - Sardi et al., 2013) and provided to list of species. Species conservation status determinated based on Government Regulation No. 7 of 1999, IUCN Red List of Threatened Species (www.iucnredlist.org) and CITES Appendices I and II (CITES, 2015). The data of species that have been prepared in the form of the table is then verified to the

community around the concession area of PT PALJ and through field observations to ensure its existence

Land cover

Land cover is required in HCV 1 to 4 assessments. The main data used for the classification of land cover in the location of permit area of PT PALJ is the current history of land cover and land cover back in 2015. The satellite imagery data used of Landsat Imagery 8 OLI Band 654 Path/Row 120/59 ETM Satelite images covered 2014 and 2015 from the USGS website. The latest satellite images of 2015 are analyzed and verified with satellite imagery in previous years, then it will carry out land cover classification by digitizing the screen on a scale of 1: 50,000. Classification of land cover at the stage of image interpretation activities using the classification of The Southeast Asia 2005 Land Cover data set (Gunarso et al., 2013) published by the RSPO.

Ecosystems

In assessment of HCV 3, ecosystem mapping in the bio-physiographic unit where the location permits area of PT PALJ is using a proxy of the RePPProT classification in West Kalimantan. To determine rare and threatened ecosystem types, carry out of spatial analysis through overlay between ecosystem map in the bio-physiographic unit with land cover map 2015. Furthermore, to ensure that this area is containing an threatened and rare ecosystem classified at the national or international system, then spatial analysis should be done through overlaying between the ecosystem maps in the biophysiographic unit with the IUCN Rare Ecosystem Map of 2013-2015 (www.iucnrle.org).

Environmental services

In the assessment of HCV 4, the mapping of the rivers network and springs existence are carried out by overlaying between the concession area map of PT PALJ with Map of Watershed Zones of West Kalimantan Province and Digital Elevation Model (DEM) SRTM 90 m USGS NASA (2014). Map of river network has been prepared subsequently and used as a material verification to the community around the concession area of PT PALJ and through field observations to ascertain its existence and name. Determination of topography and slope in the concession area of PT PALJ is carried out by overlaying between the concession areas of PT PALJ with Digital Elevation Model (DEM) SRTM 90 m USGS NASA (2014). Determination of land in the concession area of PT PALJ is carried out by overlaying between the concession area of PT PALJ with land system Map from RePPProT (1988). Furthermore, the data of the slope and soil class is supplemented with the rainfall and soil data used as the material for calculating and preparing the Erosion Hazard Level (TBE) map. Map of river / spring network and TBE in the concession area of PT PALJ is then overlaid with land cover map, then used as a reference for field inspection, as well as to observe whether there is an area that can serve as natural break/fire break or not.

Social culture data

In the assessments of HCV 5 and 6, the determination of village distribution is carried out by overlapping between the map of location of permit area of PT PALJ with Indonesian Topographic Map (Geospatial Information Agency); While for the distribution of the tribe is carried out by overlaying between the map of location of permit area of PT PALJ with map of Tribes Distribution in Borneo Island. Other secondary data used in HCV 5 assessment are from Sintang Regendy in Figures 2015, Ketungau Tengah Sub-district in figures and Report of Social Impact Assessment PT PALJ, which is produced together in parallel with HCV assessment.

3) Primary Data Collection

Validation of mapping and landscape

Validation of mapping and landscape is conducted in order to assess the accuracy of boundary clearance, the village/settlement location, topography, land cover, river networks, hills area and ecosystems. Field inspections are carried out in some areas of concession boundary of land cover types, rivers and hilly areas.

Flora/plants

Determination of sample units of flora/plants are conducted through overlapping maps of land class, topography, soil types, rivers distribution and land cover. Based on the results analysis of sample plots in the location permit area of PT PALJ, it has obtained as much as observation 13 locations namely: hilly area (1 location), secondary forest area (2 locations), riparian zone (9 locations) and bufferzone of protected forest (1 location).

Data collection on flora on each sample unit using the method of encounter that is by noting the types of flora found along the path of observation, where it is conducted at each point of observation through the length of 200-500 meters. Before setting the sample units, it is should be conducted of rapid field observation activity (recognaissance survey) and interviews with local community / management unit staffs in order to improve accuracy of the data's.

Plant data collected in the field includes all of plant habitus, including: trees, herbs, shrubs, lianas, epiphytes, fern, bamboo, palms and pandanus. To identify the plants species refer to several reference, among others: as presented in the References. Furthermore to know the plants / flora protection status can be obtained from the IUCN and CITES Websites as well as from the Government of Indonesia's policy Government Regulation No. 7/1999).

Fauna/wild animals

Determination of sample units of fauna / wildlife is conducted by overlapping between land class maps, topography, soil type, distribution of river, land cover, and distribution of wildlife (both from the literatures as well as information from the company and the community). Prior establishing the sample plot's, a recognaissance method is conducted first and interviews with local communities / UP staff to improve data accuracy. The fauna data taken is the data of species present in the sample plot's. Based on the results analysis of sample units of fauna / wildlife, it has obtained as much as 13 location in the location permit area

of PT PALJ. Distribution of sample plots of fauna/wildlife are located in the same location with sample plots flora, namely: hilly area (1 location), secondary forest area (2 locations), riparian zone (9 locations) and bufferzone of protected forest (1 location).

Mammals

Data collection on mammals at each unit of example is conducted using rapid appraisal techniques, by combining 4 (four) ways, they are: (1) Interviews with the community, especially hunters and staff the company; (2) Checklist of list of mammal species obtained from Environmental Impact Analysis report, (3) Encounter either directly (visual) or indirect (footprint, sound, scratch and dirt) and (4) Observation of the quality of mammal habitat done in collaboration with the flora team. Interview with the community is aim to inquire of mammals that are found and their habitat quality is conducted in 6 (six) villages. Observation with the encounter technique is conducted at each observation location, where at each point of observation is conducted through the length of 200 to 500 meters. In general, observations on mammals were conducted from 07.30 to 17.00, but evening observation was also conducted in the concession area on the way back from the field to the camp on occasional nights as well. Besides, the observations were conducted in the surrounding of the camp area in the morning and at night.

Birds

The data collection of birds at each sample unit is conducted by using rapid appraisal techniques, by combining 4 (four) ways, which consist of (1) Interviews with communities, especially hunters and company staff; (2) Checklist of bird species list obtained from Environmental Impact Analysis Report (3) Encounter either directly (visual) or indirect (sound, fallen body part, and dirt), and (4) Observation of bird habitat quality is done in cooperation with. Interviews with the community is aim to inquire bird species that are found and their habitat quality is conducted in eight villages. Observation with the encounter technique is conducted at each observation location, where at each point of observation is conducted through the length of 200 to 500 meters. Bird observations are generally conducted from 07.30 to 17.00, however, we also recorded if birds found in the concession area on the way back from the field to the camp as well as in the night time. Besides, the team also carried out the observation of birds in the surrounding of the camp area in the morning and at night

Herpetofauna (reptiles and amphibians)

Herpetofauna data collection in each sample's unit was conducted using rapid assessment techniques, combining 4 ways, namely (1) Interviews with communities, especially hunters and company staff; (2) Checklist of the list of types of herpetofauna obtained from the Environmental Impact Assessment report document, (3) The encounter either directly (visual) or indirectly (voice) and (4) Observation of herpetofauna habitat quality is done in collaboration with the flora team. Interview with the community to ask about the types of herpetofauna found and the quality of their habitat. Observations of reptiles were performed at each

observation location conducted together with bird and mammal observations; whereas amphibian observations are focused on river and swamp areas. The collected animal data includes the taxa of mammals, birds and herpetofauna (reptiles and amphibians). To identify the wildlife species found in reference to the Mammalian Identification Guide (Mammal Field Guide in Kalimantan, Sabah, Sarawak and Brunei Darussalam), Birds (Bird Fields Guide Series in Sumatra, Java, Bali and Kalimantan), Reptiles and Amphibians A Photographic Guide To Snakes and Other Reptiles of Peninsular Malaysia, Singapore and Thailand) and the Indonesian Bird List Book. 2. Then the fauna status can be obtained from the IUCN and CITES Websites as well as from the Government's policy documents (Government Regulation No. 7/1999). Herpetofauna observations are generally conducted from 07.30 to 17.00, however, we also recorded if birds found in the concession area on the way back from the field to the camp as well as in the night time. Besides, the team also carried out the observation of birds in the around of the camp area in the morning and at night.

Environmental services

The data collection of environmental services in the location of permit area of PT PALJ is conducted at sample units that have been planned, which include riparian zone (9 locations), hilly area (1 location), secondary forest land cover (2 locations) and bufferzone of protected forest (1 location). Data and information collected for the purpose of verifying the physical aspect is the existence and condition of the river network, road network, regional boundary, soil types, topography and conduct an overview in the area that is being assessed as a whole. Related with to environmental services, data and information that needs to be verified are: (1) the condition of land cover; (2) the condition of river water quality (color, smell, taste, turbidity); (3) River discharge which is verified is the cross-sectional area of the river (river width and river depth) and flow velocity; (4) utilization of the river; water spring, and swamps, (5) data and information on the occurrence of floods and puddles; (6) examine the areas with erosion hazard level heavy until very heavy (land cover, slope, slope length, soil solum), (7) slope more than 40% (land cover, soil solum), (8) the ecosystem that has the ability in controlling the local hydrologic functions and natural firebreaks (riparian); (9) data and information on local community wisdom in the preparation of land, by burning or not.

Social and culture

Social and cultural surveys to explore the existence of HCVs 5 and 6 were carried out in some of the villages used as study sites. The priority of village sampling is based on the linkage of villages with the location permit area of PT PALJ, the first priority is the villages located in the location permit location, the second priority is the villages located adjacent to the location permits and the third priority is the villages that are outside the location permit. Identification of HCVs 5 and 6 is done gradually, through a participatory mapping process to obtain information directly from the community by mapping together areas that have potential HCVs 5 and 6. The next stage is the interview and field observation by using purposive sampling method in the determination target respondents who have been processed from

the participatory mapping process. Through the process, data and information on areas that have elements of HCV 5 and 6 will be mapped spatially and determined by delineation of their protected areas. An area is said to be important if the area is used by one or more community members to meet its subsistence needs in the absence of alternatives that are affordable or can not be replaced by substitutes. The rating of important values of forests or other natural ecosystems is based on scores, as follows:

100%, If the overall requirement is met by a single source, the source is considered very important, score = 4.

50% -99% If most needs are met by one source and rarely by other sources, the source is considered important enough, score = 3.

25% -49% If the need (met by some sources below 50% each, the source is considered important, score = 2.

10% -24% If needs are met by many other sources, the source is considered less important, score = 1.

0% -9% If the need is no longer met by forest or other natural ecosystems the source is considered unimportant score = 0.

If there is any doubt then the principle of caution is assumed by assuming that the community does not have an alternative source of need fulfillment. In some cases, the assessment team consults with ecologists to determine this interaction.

The identification method of HCV 6 is carried out same with in the HCV identification method 5. Data sources of HCV 6 assessment are obtained from local community subjects ie; local community leaders and citizens, as well as information from secondary data and other documents. In-depth information exploration for the identification of HCV 6 areas is also done through indepth interviews and FGDs in the villages around of permit area of PT PALJ namely Wana Bhakti Village, Marga Hayu, Wirayuda, Senangan Kecil, Mungguk Gelombang and Swadaya, with 31 respondents interviewed.

Indicators used to indicate the distribution of “ulayat” areas or distribution of forest resources that related to collective and individual behavior of local communities to meet their cultural needs, including zoning based on specific cultural rules, archaeological site distribution, distribution of ritual activities for local communities, nature for the fulfillment of cultural needs. Location of flora, fauna, environmental services and social economid and cultural data’s collection in the location permit area of PT PALJ is presented in **Figure 7.**

4) Analysis and Mapping

Analysis and mapping are the most important and crucial stages in the assessment process of areas indicated to contain of HCVs. In the analysis phase, a comprehensive and in-depth study and review of secondary information and primary data obtained from the field , covered aspects of biophysical data’s, spatial planning, flora, fauna, social and cultural. The results of the analysis are then used

to identify areas that have HCVs, which will then be mapped with the help of geographic information system software (GIS).

5) Public Consultation

Public consultation is one of the processes to be followed in the assessment of HCVs. The process of preparing the final report of the HCV assessment should be presented to stakeholders through public consultation. The purpose of public consultation is preented the results of the assessment to the public in order to gain input on the findings and conclusions of the widely parties. Public consultation is also a form of transparency of the HCV assessment process so community can know the HCV areas that containing in the location permit area of PT PALJ.

Public consultation activities were conducted at SMP / SMK Hall, Ketungau Tengah Sub-district attended by several government agencies such as: Forestry and Plantation Office of Sekadau District, BLH Office of Sintang Regency, Ketungau Tegah sub district leader (head of sub district, police head, military rayon commando), Management Unit staffs, Local Communities villages, Village Representative Body (BPD), village apparatus, traditional leaders and community leaders. In addition, public consultations are also conducted through FGD (Focus Group Discussion) in each village with village heads, village apparatus and community leaders.

6) HCV Findings and Recommendations

Activities undertaken in presenting HCV findings and recommendations, including: project information and site descriptions, broader landscape, national and / or regional context, assessing HCV 1-6, drawing up maps of HCV and HCV areas and consultation with stakeholders, threat assessment and preparation of management and monitoring recommendations.

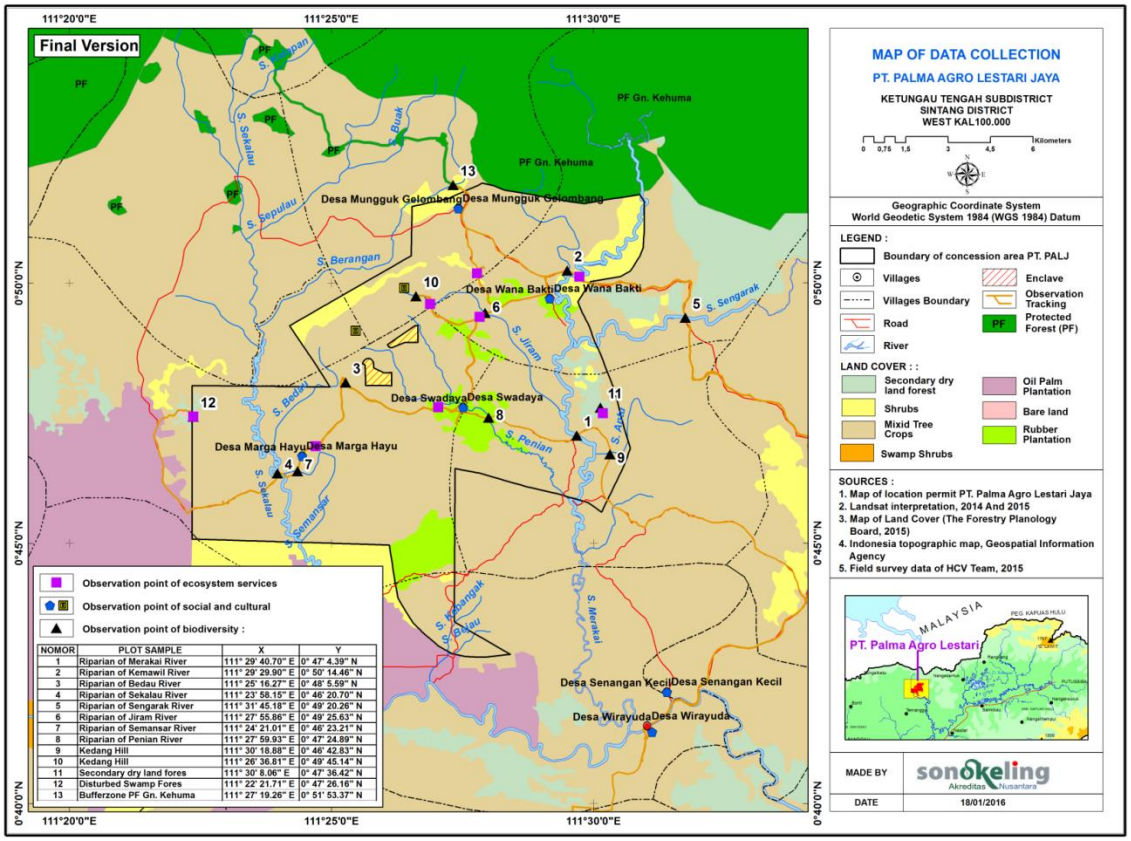
7) Reporting

The final step in the HCV assessment process is the preparation of the assessment report. Preparation HCV Assessment reports should be used Template of HCV Assessment Report of HCVRN.

8) Peer Review

Peer review is done at the draft report status, thus the final report of the HCV assessment activities becomes comprehensive, factual and in accordance with the rules of multidisciplinary science. In addition, peer review can also be done on a final report. This is usually done to get another opinion from other experts from the same field at the stage of formulating an identified HCV management plan.

Review of High Conservation Value Identification Report (HCV) in the permit area of PT PALJ is done by Dr. Kunkun Jaka Gurmaya in January 2016. He is one of the Reviewer licensed by HCV-RN and is an Independent Consultant.



NOMOR	PLOT SAMPLE	X	Y
1	Riparian of Merakai River	111° 29' 40.70" E	0° 47' 4.39" N
2	Riparian of Kemawil River	111° 29' 29.90" E	0° 50' 14.46" N
3	Riparian of Bedau River	111° 25' 16.27" E	0° 48' 5.59" N
4	Riparian of Sekalau River	111° 23' 58.15" E	0° 46' 20.70" N
5	Riparian of Sengarak River	111° 31' 45.18" E	0° 49' 20.26" N
6	Riparian of Jiram River	111° 27' 55.86" E	0° 49' 25.63" N
7	Riparian of Semansar River	111° 24' 21.01" E	0° 46' 23.21" N
8	Riparian of Penian River	111° 27' 59.93" E	0° 47' 24.89" N
9	Kedang Hill	111° 30' 18.88" E	0° 46' 42.83" N
10	Kedang Hill	111° 26' 36.81" E	0° 49' 45.14" N
11	Secondary dry land fores	111° 30' 8.06" E	0° 47' 36.42" N
12	Disturbed Swamp Fores	111° 22' 21.71" E	0° 47' 26.16" N
13	Bufferzone PF Gn. Kehuma	111° 27' 19.26" E	0° 51' 53.37" N

Figure 7. Map of Location of flora, fauna, environmental services and social economic and cultural data's collectionin the location permit area of PT PALJ.

2.3. Land Semidetails and Land Suitability Assessment

a. Assessor Credentials

Land Semidetails and Land Suitability Assessment was conducted by : PT Catur Samasta Indonusa

Address: Komplek Perumahan Bogor Raya Permai, Blok FA IV No. 37 Curug – Bogor, West Jawa

Table 7. Composition Team

No.	Nama	Position
1.	Bukhari, SP, MSi	Team Leader/ Soil Expert and Land Resources
2.	Dandun Sutaryo, SSi	Field Coordinator/ Soil Expert
3.	Muhibuddin, SP, MSi	Supervisi/Surveyor
4.	Muhamad Majid, SP	Soil Profile /Surveyor
5.	Muhammad Nuriman, SP, MSi	Surveyor
6.	M. Leket Situmorang, SP	Surveyor
7.	Fahrulrozi, SP	Surveyor
8.	Bejo Hartono	Surveyor

No.	Nama	Position
9.	Ahdi Muhtadin, SHut	GIS
10.	Tatang Komara	Admin & Logistic

b. Methods

The time frame for the implementation of the Semi Land Detail Survey and Land Suitability is carried out for 3 (three) months, namely September - November 2016. While the data collection is carried out for approximately 10 (ten) days starting from September 5-14, 2016.

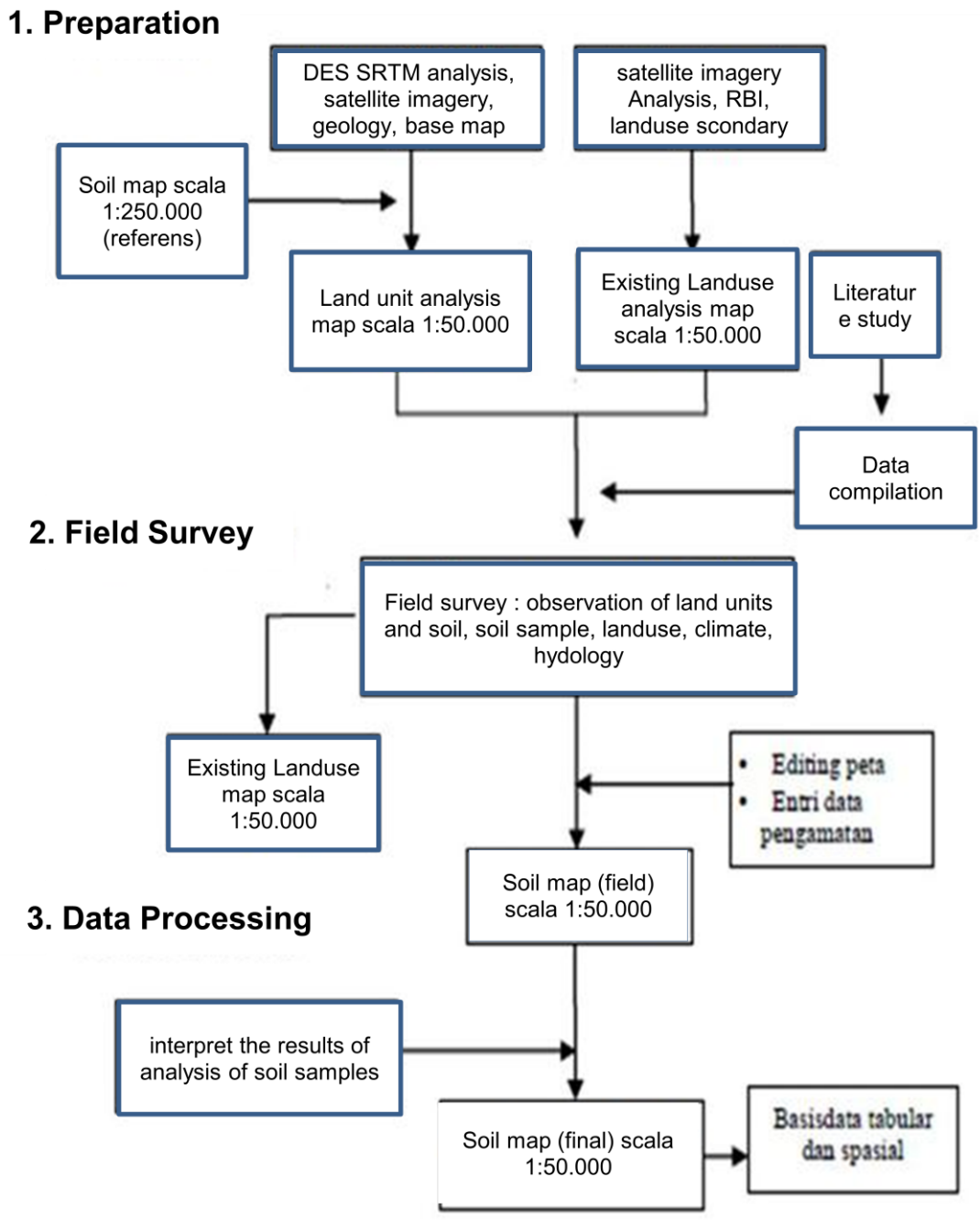


Figure 8. Methods

2.4. Carbon Stock Assessment and GHG Emissions

a. Assessor Credentials

Name	:	Kasuma Wijaya, S.Hut, M.Si
Address	:	Perum Griya Melati Blok C3/23, RT. 003, RW. 013, Kelurahan Bubulak, Kecamatan Kota Bogor Barat, Kota Bogor, Provinsi Jawa Barat
Position	:	Land covers image analysis and GIS experts
Register	:	Registered HCS Approach Practitioners

b. Methods

CSA and GHG Activities in PT. PALJ is conducted in September - October 2018. CSA and GHG activities in the Palm Oil Area of PT. Palma Agro Lestari Jaya follows the RSPO GHG assessment procedure guidelines for new plantings. The RSPO GHG assessment procedure for new plantings has four key stages, namely (1) Carbon Stock Assessment, (2) GHG Emission Assessment for new plantings, (3) GHG Emission Management and Mitigation Plans and (4) GHG Assessment Reporting for New Plantings. The key steps in the RSPO GHG Assessment Procedure are presented in **Figure 9**.

The CSA methodology has a process stage which consists of two key steps. The first step is the preparation of a map of land cover from satellite imagery and the second step is estimating carbon stocks in the new development area. The carbon stock estimation using these two key steps can then be used to estimate RSPO GHG emissions resulting from changes in land use for new development areas

The estimated carbon stock required must include carbon stored in: (1) Above-ground biomass, (2) underground (root) biomass and (3) peat soil - if any. The total amount of carbon stock at the assessment site is the sum of carbon stocks in the above and below ground biomass estimates with peat soil carbon stock estimates. The key steps for carbon stock assessment are presented in **Figure 10.**

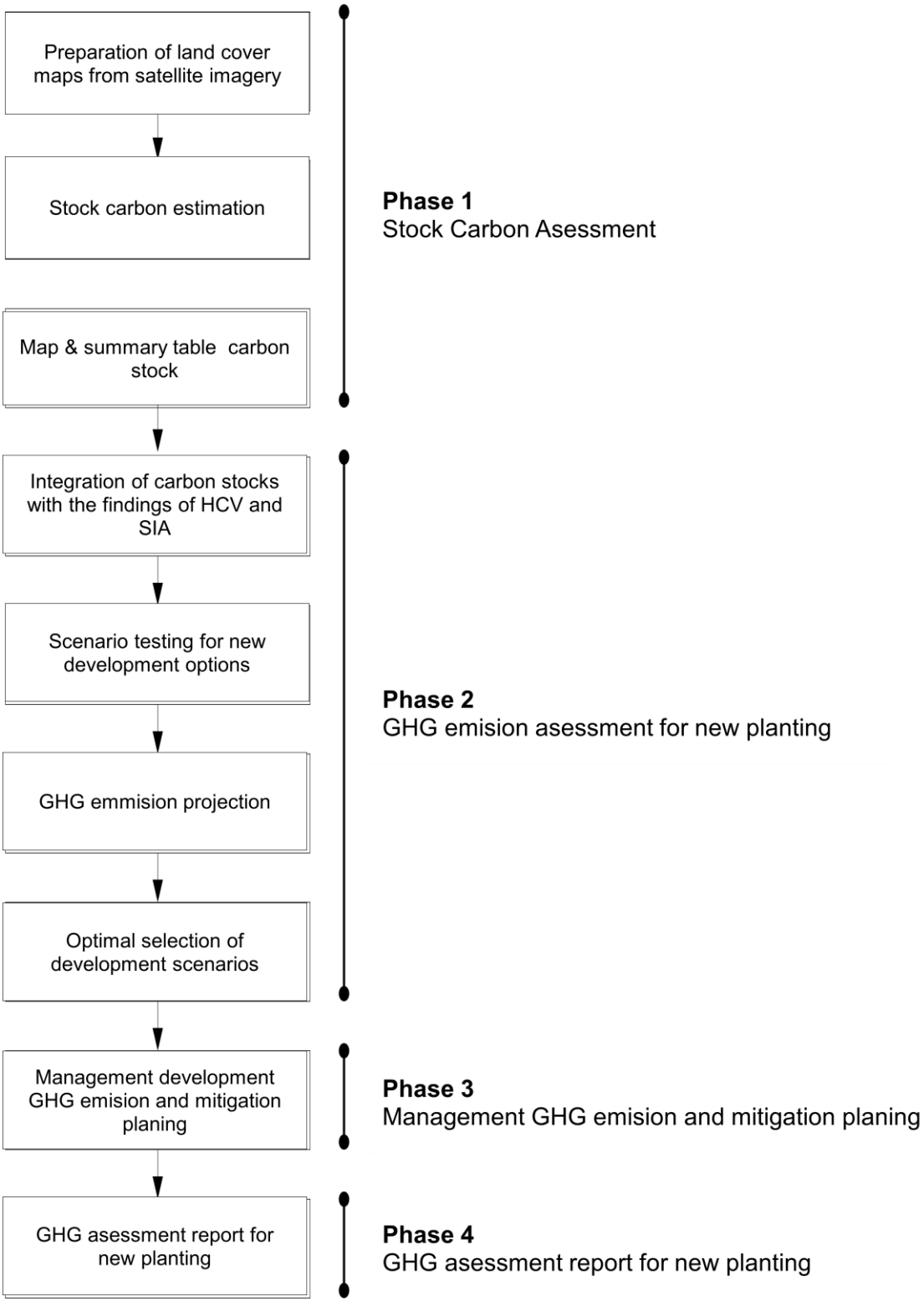


Figure 9. Stage of RSPO GHG Assessment Procedure for new planting

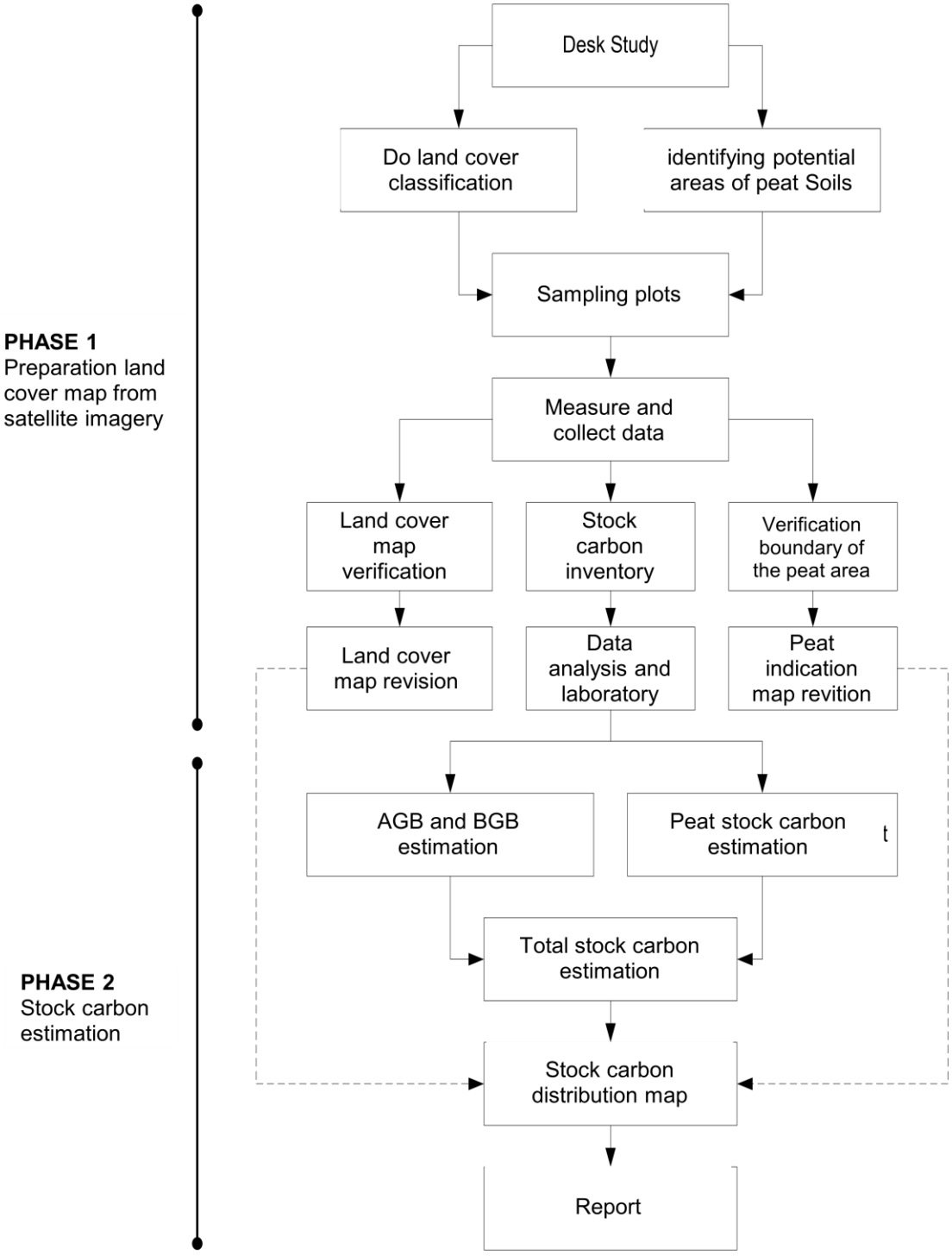


Figure 10. Key Step Diagram for Carbon Stock Assessment

Sampling Plots

The minimum number of plot needs is calculated by Winrock Calculator which uses a confidence level of 90% and a sampling error of 20%. This condition is possible because in SNI 7724: 2011 concerning Carbon Measurement in the Field states that the maximum permissible sampling error is 20%. Many natural factors in the field that cannot be controlled by humans such as topography, climate and weather, so the maximum sampling error of 20% is still allowed

In the Winrock Calculator, the calculation template uses a formula built by Walker et al. (2007) based on the CDM - Executive Board 2006 namely AR-AM0001, AR-AM0003, AR-AM 0004, AR-AM0005, AR-AM0006 & AR-AM0007. The formula is as follows:

$$n = \frac{\left[\sum_{i=1}^{m_{SP}} N_i \cdot st_i - \sqrt{C_i}\right] \cdot \left[\sum_{i=1}^{m_{SP}} N_i \cdot st_i \cdot \frac{1}{\sqrt{C_i}} \cdot\right]}{\left(N \cdot \frac{E}{z_{\alpha/2}}\right)^2 + \sum_{i=1}^{m_{SP}} N_i \cdot (st_i)^2}$$

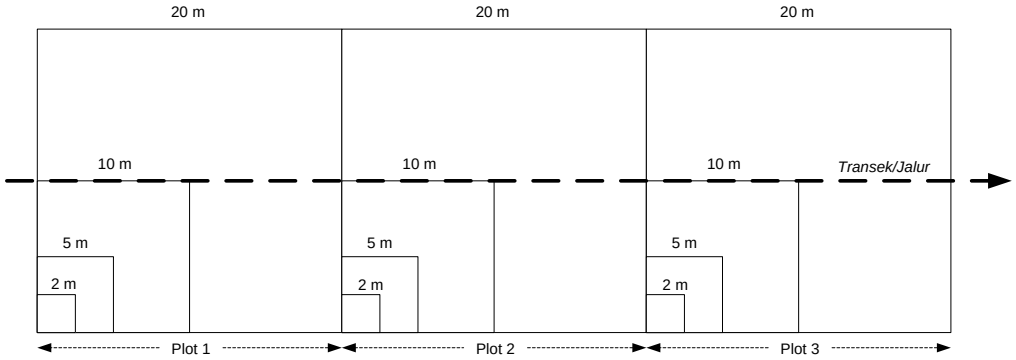
$$n_i = \frac{\sum_{i=1}^{m_{SP}} N_i \cdot st_i - \sqrt{C_i}}{\left(N \cdot \frac{E}{z_{\alpha/2}}\right)^2 + \sum_{i=1}^{m_{SP}} N_i \cdot (st_i)^2} \cdot \frac{N_i \cdot st_i}{\sqrt{C_i}}$$

$$N = \frac{A}{AP} \quad N_i = \frac{A_i}{AP} \quad E = Q$$

Information:

A = *Total size of all strata, eg total project area; ha*
Ai = *Size of each stratum; ha*
AP = *Sample plot size; ha*
Sti = *Standard deviation for each stratum i; dimensionless*
Ci = *Cost of establishment of a sample plot for each stratum i; e.g. US$*
Q = *Approximate average value of estimate quantity Q (eg tree biomass; m3/ha)*
p = *desired level of precision (e.g. 10%); dimensionless*
N = *Maximum possible number of plots in the project area*
Ni = *Maximum possible number of plot in stratum i*
E = *Allowable error (20%)*
N = *Sample size – total number of sample plots required in the project area*
ni = *Sample size for stratum i*
Z = *Value of the statistic z (normal probability density function), for* *= 0.05 (implying a 95% confidence level)*

The design of the sample plots used in the inventory of carbon stocks for above-ground biomass (Above Ground Giomass / AGB) are nesting and square shapes. A maximum of 5 sample plots are placed in each transect / lane. The sample plot design in the carbon stock inventory activity is presented in Figure 11.



Information:

- Kelas Semai dan tumbuhan bawah (2 x 2 meter)
- Kelas Pancang (5 x 5 meter), DBH pohon 2 – 10 cm
- Kelas Tiang (10 x 10 meter), DBH pohon 10 – 20 cm
- Kelas Pohon (20 x 20 meter), DBH pohon >20 cm

Figure 11. Design plot of carbon stock measurement samples

Carbon Stock Inventory

The activity of inventorying carbon stocks for above-ground biomass (AGB) in the Pile, Tree and Tree classes in the form of DBH measurements of trees using tape diameter, identification and recording of species and numbers of species and taking examples of wood representing each species (Figure 12).

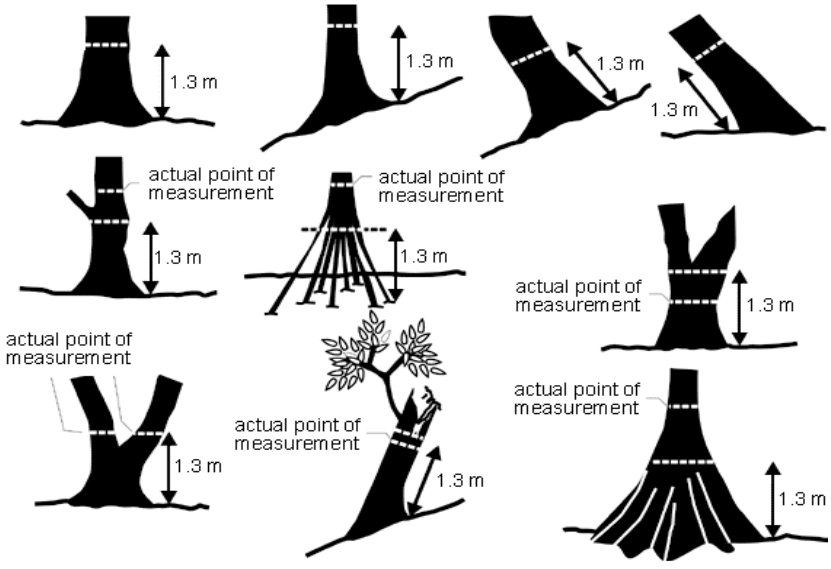


Figure 12. Measurement of Chest Height in Various Tree Conditions

Each sample of the wood is weighed in the wet field and then taken to the laboratory for drying and weighing the dry weight, so that the specific gravity (BJ) will be known.

Whereas for the measurement of biomass in seedlings and understorey classes is carried out as follows (SNI 7724: 2011):

a) cut all seedlings and understorey on the ground using cuttings scissors;
b) weigh the total wet seedling and understorey wet weight in the measurement plot area;
c) take and weigh the wet weight of the sample as much as ± 300 grams;
d) do the drying by using an oven in a laboratory with a temperature range of 70 ° C to 85 ° C until it reaches a constant weight;
e) weigh the dry weight of seedlings and understorey;
f) analyze organic carbon in the laboratory to see the carbon content

Measuring carbon stocks on peat soil is done by measuring the depth of peat soil using a soil drill at every distance of 200 - 300 meters on the stub path to the plot and taking at least 3 soil samples. The soil samples were analyzed at the laboratory to determine the weight of the contents and Organic Carbon Content.

Carbon Stock Estimasion

The estimated carbon stock is the second step of the carbon stock assessment carried out to find out (a) carbon stocks from above and below biomass, and (b) peat carbon stocks.

The amount of carbon stock in the valuation is expressed in tons of carbon per hectare (tC / ha). As defined by IPCC (2006), there are five carbon pools, namely soil biomass, underground biomass, dead wood, litter, and soil organic matter. In assessing carbon stocks in RSPO GHG procedures, this assessment only needs to take into account above-ground biomass (AGB), underground biomass (BGB) and soil organic matter. Soil organic matter only needs to be estimated if peat soil

Above Ground Biomass **(AGB)**

The general equation used in estimating carbon stocks for above ground biomass is:

$$\textit{Massa Karbon (ton)} = \textit{Biomassa} \times (\textit{Faktor Konversi Karbon})$$

The carbon conversion factor estimates the carbon component of vegetation biomass. This factor can be produced for a particular forest type, or using a standard value from the IPCC of 0.47 (IPCC, 2006).

Allometric equations for estimating biomass use the equation Ketterings et al (2001), namely:

$$TDW = 0{,}11 \times \rho \times (DBH)^{2.62}$$

Information:
TDW = biomassa (kg); ρ = wood density (gr/cm^3), DBH = diameter setinggi dada (cm)

In accordance with the sample plot design above, there are several formulas to determine the value of biomass and carbon stocks for the stake class, pole, tree, seedling and understorey, namely:

a) Calculation of Biomass and carbon per Ha for stake level (5 x 5 meters)
    - The value of biomass is calculated using the formula for using BJ and DBH from wood tree samples from the plot location

- Temporary carbon stock values (Cs) for stake are calculated with 0.47 x biomass value (Kg)
- The carbon stock value for the stake (ton C / ha) is ((Cs) / 1000) x (10000/25)

b) Calculation of Biomass and carbon per Ha for pole level (10 x 10 meters)

- The value of biomass is calculated using the formula for using BJ and DBH from wood tree samples from the plot location
- Temporary carbon stock values (Cs) for poles are calculated with 0.47 x biomass value (Kg)
- Carbon stock values for poles (tons C / ha) are; ((Cs) / 1000) x (10000/100)

c) Calculation of Biomass and carbon per Ha for Tree level (20 x 20 meters)

- The value of biomass is calculated using the formula for using BJ and DBH from wood tree samples from the plot location
- Temporary carbon stock values (Cs) for trees are calculated with 0.47 x biomass value (Kg)
- Carbon stock values for trees (tons C / ha) are ((Cs) / 1000) x (10000/400)

d) Calculation of Biomass and carbon per Ha for seedling and understorey levels (2x2 meters)

- The value of biomass is obtained from laboratory analysis using the formula:
  Bo = (Bx x Bbt) / Bbs, where Bo = weight of organic matter (kg), Bks = sample dry weight (kg), Bbt = total wet weight (kg), Bbs = sample wet weight (kg).
- Temporary carbon stock values (Cs) for seedlings and understorey are calculated with 0.47 x biomass or organic matter value (Kg)
- Carbon stock values for trees (tons C / ha) are ((Cs) / 1000) x (10000/400)

Below Ground Biomass (BGB)

In assessing carbon stocks in the RSPO GHG procedure it is explained that it is not possible to measure BGB (root biomass) directly and the preferred approach is to use the standard BGB AGB ratio (commonly referred to as the shoot root ratio).

The ratio of shoot roots varies depending on the type of vegetation and local situation, and for the purposes of the RSPO GHG Assessment Procedure it is recommended that a value of 0.18 be used for Southeast Asian tropical

The general equation used in estimating carbon stocks for subsurface biomass (BGB) is:

$$\mathbf{B_{bp} = RAP \times B_{ap}}$$

Information:

B_{bp} = biomassa di bawah permukaan tanah (kg); RAP = Nilai Rasio akar: pucuk atau sebesar 0,18; B_{ap} = biomassa di atas permukaan tanah (kg)

Peat Carbon Stock

Some parameters needed to calculate soil carbon stocks on peatland are as follows:

1) Content weight (g / cm3 or kg / dm3 or t / m3)
2) Organic carbon content (% based on weight or g / g or kg / kg)
3) Depth or thickness of peat (cm or m)
4) Land area where carbon stock will be estimated (ha or km2)

The total amount of peat carbon stock in assessing carbon stocks in the RSPO GHG procedure is calculated

$$\mathbf{C_{gambut}\ (ton\ C) = A\ (ha) \times 10.000\ m^2/ha \times D\ (m) \times BD\ (ton/m^3) \times C\ (\%)}$$

Information:
A = total area of peat in hectares; D = average peat depth (meter); BD = peat content weight (ton/m^3); C = peat carbon content in the percentage of dry weight

Total Carbon Stock

a. Carbon Stock The total in sample plots for above-ground biomass (AGB) and below ground biomass (BGB) are calculated with the following

$$\mathbf{C_{plot} = C_{AGB} + C_{BGB}}$$

Information:

C_{plot} = Total Carbon Stock in the plot (Ton C/ha)

C_{AGB} = Stock Total carbon above ground (Ton C/ha), which is the summation of Carbon Stock for poles, stakes, trees and seedlings.

C_{BGB} = Stock of Total Carbon below ground biomass (Ton C/ha)

b. The Total Carbon Stock in the land / class cover class is calculated by the following equation:

$$\mathbf{C_{stratum} = (C_{Plot} / n_{stratum}) \times Luas\ stratum}$$

Information:

$C_{stratum}$ = Stratum Total Carbon Stock (Ton C)

C_{plot} = Total Carbon Stock in the plot in the strata (Ton C/ha)

$n_{stratum}$ = Number of Plots in the stratum

c. Total Carbon Stock in the RSPO GHG procedure in the study area is calculated using the following equation:

$$\mathbf{C_{Total} = C_{Total\ Stratum} + (C_{Gambut} \times A_{Gambut})}$$

Keterangan:

C_{Total} = Total Carbon Stock in the study area (Ton C)

$\mathbf{C_{Total\ Stratum}}$ = Carbon Stock Total all land cover / stratum classes (Ton C)

C_{Gambut} = Stok Karbon Tanah Gambut (Ton C/ha)

A_{Gambut} = Luas total gambut (ha)

Assessment of the amount of GHG emissions from the planned new planting in oil palm plantations in RSPO GHG procedures using the GHG Calculator for new developments issued by RSPO.

2.5. LUC Assessment

a. Assessor Credentials

Name : Kasuma Wijaya, S.Hut, M.Si
Address : Perum Griya Melati Blok C3/23, RT. 003, RW. 013, Kelurahan Bubulak, Kecamatan Kota Bogor Barat, Kota Bogor, Provinsi Jawa Barat
Position : Land covers image analysis and GIS experts
Register : Registered HCS Approach Practitioners

b. Methods

Relevant time of clearance period	
☒ November 1, 2005 – November 31, 2007	☒ December 1, 2007 – December 31, 2009
☒ January 1, 2010 – May 9, 2014	☒ After May 9, 2014

Date of satellite image acquisition for each time of clearance period		
Period	**Date of acquisition**	**Cloud cover (%)**
Before November 1, 2005 (baseline)	14 Maret 2005	< 10%
November 1, 2005 – November 31, 2007	7 May 2007	< 20%
December 1, 2007 – December 31, 2009	8 Agustus 2009	< 5%
January 1, 2010 – May 9, 2014	24 June 2013	0%
After HCV area identified	8 July 2015	< 5%
After becoming RSPO member (if relevant)	Not relevant	-
After the management unit acquired (if relevant)	Not relevant	-
Latest satellite image used for ground truthing	14 February 2018	< 20%

Satellite images used in the LUC Analysis	
Satellite Name	Landsat TM 5, Landsat TM , dan Landsat 8
Resolution	30 meter

List of data and document used in the LUC Analysis		
1. Land clearance progress map (montly)	☐ Available/used	☒ Not available
2. Land clearance progress data (montly)	☐ Available/used	☒ Not available
3. Planting year map	☐ Available/used	☒ Not available
4. Planting year data	☐ Available/used	☒ Not available

5. Land compensation progress map (if applicable)	☐ Available/used	☒ Not available
6. Land compensation progress data/document (if applicable)	☐ Available/used	☒ Not available
7. Soil map	☒ Available/used	☐ Not available
8. Slope map	☒ Available/used	☐ Not available
9. Watershed-hydrology map	☒ Available/used	☐ Not available
10. HCV assessment report	☒ Available/used	☐ Not available

Image processing		
Radiometric correction	☐ Conducted	☒ Not conducted
Geometric correction	☐ Conducted	☒ Not conducted

Image analysis		
☐ Supervised classification	☐ Unsupervised classification	☒ Object based visual interpretation

Survey design	
Number of sample	The minimum amount of sample needs is calculated with Winrock Calculator
Sampling method	Teresterial Sampling
Reference for sampling method	https://www.winrock.org/document/winrock-sample-plot-calculator-spreadsheet-tool/

Field verification	
Validating the land cover data	ground truthing
Compiling information related to historical land use in the study area	Compilation of historical information on land use by combining information from (1) ground truthing, (2) document review, dan (3) interview
Identification the loss of social HCVs	Conducted by review of HCV documents and in-depth interviews with key responden
Identifying the loss of areas where planting is prohibited by RSPO P&C or by country's specific legislation (e.g. riparian zones, steep slope, deep peat)	Analysis of the data resulting from the overlay between data on land cover changes in each period of liability with the distribution of areas not allowed by P & C for oil palm planting

Image validation	
Method used for LUCA accuracy assessment	the Kappa Accuracy method

Change detection analysis
In LUC analysis activities, change detection analysis is based on review of company

documents and in-depth interviews. Review of company documents including acquisition documents and HCV Report. In-depth interviews with key respondents include local community leaders, and company staff who have long been in the study area, relating to the land cover baseline, history of land ownership and activities, land clearing activities and community cultivation patterns.

Vegetation coefficient
Grouping land cover classes into the vegetation coefficient category follows the guidance RSPO, which in principle consists of 4 categories, namely (1) Coefficient 1.0, for Primary Forest land cover, (2) Coefficient 0.7, for Secondary Forest land cover, (3) Coefficient of 0.4, for mixed garden or agroforesry land cover, and (4) coefficient 0.0, for non-forest cover such as fields, rubber, oil palm, rice fields, shrubs and grasslands.

2.6. FPIC process

a. Assessor Credentials, conducted by Sigit Pamungkas, M.Si., Kasuma Wijaya, M.Si, Hendy Kusnadi.

No	Composition Team	Position	Expertise
1.	Kasuma Wijaya	Team Leader	- GIS Expert and *partisipatory mapping*
2.	Sigit Pamungkas	Penanggung Jawab	- Comunication and Community Development - Communication of Agricultural and Rural Development - FPIC and *partisipatory mapping*
3.	Hendi Kusnadi	Assistant	- GIS Assistant and *partisipatory mapping*

b. Methods

FPIC or activities are carried out on 3 - 8 October 2018

Referensi and Guidelines FPIC

The references and guidelines used as references in conducting FPIC studies at PT PALJ are as follows:

1) Free, Prior and Informed Consent Guide For RSPO Members, RSPO Human Right Working Group 2015. Endorsed by the RSPO Board of Governors meeting on 20 November 2015 in Kuala Lumpur.
2) United Nations Declaration on the Rights of Indigenous Peoples, relating to FPIC (article 32), Lands and Territories (articles 20 and article 26), Displacement and the right to restitution and correction / submitting compensation (article 10, article 28), Representatives (article 18 , article 19), based on customary agreements (article 3, article 4, article 5, article 33 and article 34).

3) International Law Convention, which includes:
   - International Convention on Civil and Political Rights
   - International Convention on Economic, Social and Cultural Rights
   - Convention on the Elimination of All Forms of Ethnic Discrimination
   - ILO Convention No. 169 concerning Indigenous Peoples and Tribes.

The method used in the FPIC study consists of:

1). **Secondary Data Collection** by collecting documents needed (documentation) taken from village profiles or Village Medium Term Development Plans (RPJMDes), sub-districts in numbers, districts in numbers and or other library sources.

2). **Primary Data Collection** by:

- Conditional interviews as well as in-depth interviews with community members who are considered to know the information needed (Village Head, BPD Chairperson, LPM Chairperson, RW Chairperson, RT Head, community leaders, religious leaders, local agency leaders, etc.).
- Discussions with community groups (Focus Group Discussion) and (Rapid Rural Appraisal). FGD and RRA participants consisted of Village Heads, BPD Management, LPMD, RW / RT leaders, representatives of youth leaders, representatives of religious leaders, representatives of women leaders, and representatives of other community leaders.
- Observation of physical environmental conditions, social environment, social relations, local community habits such as land use patterns and natural resources or forest resources.

3). **Triangulasi data**, integrated methods to verify each other on emerging issues, opinions and ideas such as the emergence of the latest values of norms and rules on land use, natural resource management, and SDH management that apply in the local community.

CHAPTER 3. SUMMARY OF FINDINGS

3.1. SEIA

Potential Positive and Negative Developments

PT. PALJ raises positive and negative perceptions in the surrounding community. One of the positive perceptions of the community is that they hope the company can provide employment opportunities in order to improve their welfare. On the other hand, negative perceptions that arise are; his concerns about industrial waste, promises were not fulfilled between the community and the company and the low value of local workers in the company. This negative perception arises because of his bad experiences with previous.

At that time (in 2015), the number of workers in the company PT. PALJ is still very limited because the company's activities are only up to the stage of land acquisition. In general, workers' perceptions of PT. PALJ is quite satisfied, but there are some things that need to be considered by management such as; there is a match between the results of the interview and the current working position, regarding the work safety system and personal protective equipment.

The negative impact caused by the existence of PT. PALJ is predicted to occur in the pre-construction, construction and operation stages. These negative impacts are in the form of negative perceptions caused by social jealousy, competition for job opportunities, the impact of road infrastructure (health and travel safety), the potential of low labor / worker wages (PHL, IPM and Monthly), the potential for lack of health services, potential loss of resources the livelihood of gardening / farming, the potential for ecosystem damage, the potential for environmental pollution both directly and indirectly. The disharmony between the company and the surrounding community can trigger social conflicts both vertically and horizontally.

The potential for conflict in the future is strongly influenced by the success or failure of achieving an increase in community welfare. Improving public welfare can be achieved, among others, by absorbing human resources as employees of the company, the overall participation of the community as plasma farmers and various forms of productive and social assistance for the community from the company through CSR programs. In addition, wages that are considered locally appropriate will make the community remain enthusiastic to become freelancers (PHL), especially as care workers (usually women) and harvesting (usually men).

Implementation of Good Governance in the PT. PALJ must be a strong commitment to be realized and maintained. Priorities in this context are clarity of assistance in various schemes (especially CSR), the formation of trade unions, the formation of cooperatives, fulfillment and implementation of plasma programs for the community, certainty of career paths for employees as well as professionalism, accountability, transparency, communicative, fairness, approach participation, dialogical, aspirational and democratic in the management and exploitation of plantations.

Socio-economic impacts to country, region and local communities

- **Positive impacts include**;
  - There are opportunities for people to work in companies
  - Opportunities for open education outside of school (counseling) and increasing knowledge and skills of citizens for oil palm cultivation obtained from PT PALJ.
  - The presence of oil palm plantations will reduce the unemployment rate of the village community, while reducing the exodus of residents out of the village to find decent livelihoods.
  - Residents are full of hope if the land is released to the company so that it is accompanied by a plasma plantation (as a substitute for the economic source of the community) and their family members / children while working at the company.
  - Open access to new economic activities for communities around oil palm plantations by working as a daily, fixed or monthly employee on oil palm plantations can provide a steady income for the community apart from agricultural products (rubber, rice / pepper and rice).
  - The positive perception of the residents of PT PALJ is always welcome and is always ready to help the activities and needs of the residents, such as the ease with which citizens can borrow heavy equipment from the company for road repairs.
  - There are company efforts to help resolve the problem of boundary conflict between hamlets involving Wana Bhakti Village and Swadaya Villag
  - PT PALJ's CSR program to repair road facilities and infrastructure, religious facilities and other infrastructure.
- **Negative impacts include**;
  - Concerns of residents about river pollution as a source of clean water for residents if oil palm plantations operate
  - Decreased forest area and concerns over the conversion of community plantation land from sahang / pepper, rubber into oil palm plantations will cause a complete loss of ownership of community land ownership both on productive land or critical land used to grow crops.
  - Decreased forest will have an impact on the wildlife population that is increasingly rare and indirectly will change the lifestyle of people who sometimes carry out hunting activities to make ends meet.
  - Citizens' perception that there are no more vacant land for residents to cultivate.
  - Changes in forest area or resources that cause a reduction in sources of fulfillment of basic needs for building materials, hunting areas, sources of fruits and vegetables and have an impact on reducing river water discharge.
  - Bringing workers from outside the village can provoke emotion, social jealousy and weaken the bargaining position of some local residents to become laborers in the company.
  - Opportunities to earn money as a result of GRL / GRTT.
  - Concern about the location of the plasma or the partnership garden that is far from the position of the village.

- Citizens 'concerns about the loss of livelihoods, because most of the residents' livelihoods still depend on land inside the PT PALJ concession area.
- Social jealousy between community leaders towards the heart given by the company, because not all community leaders get sago hearts every month.
- Potential social conflicts during GRL / GRTT due to unclear boundaries of community land, such as the misunderstanding of the position of land located in Wana Bhakti Village and Mungguk Gelombang Village.
- Inter-village connecting road in the form of road and road which is often passed by employees and PT PALJ workers are in a damaged condition. If the rainy season the road is muddy, slippery, and difficult to pass.

Socio-economic impacts in respect of emergent communities (workers, suppliers etc.)

Some of the internal aspects examined in the SIA assessment are (1) recruitment of workers, (2) positions and educational competencies, (3) 3. Occupational Health and Safety Management System (SMK3), (4) Personal Protective Equipment (PPE), (5) Industrial Relations, (6) Competency Development, (7) Career Paths, (8) Employee Payroll Systems, (9) Company Facilities, (10) Employee Welfare Benefits, and (11) Communication Patterns.

The social impact on the company's internal conditions has not been widely found, because the company PT PALJ has not operated optimally and is still in the process of developing plans for oil palm.

Issues raised by stakeholders and assessors comments

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

- Concerns of residents about river pollution as a source of clean water
- Decreased forest area and concerns over the conversion of community plantation land from sahang / pepper, rubber into oil palm plantations will cause a complete loss of ownership of community land ownership both on productive land or critical land used to grow crops.
- Bringing workers from outside the village can provoke emotion, social jealousy and weaken the bargaining position of some local residents to become laborers in the company.
- Concern about the location of the plasma or the partnership garden that is far from the position of the village.

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

The recommendations of the company's external relations are based on information obtained from interviews or FGDs in the area regarding the hopes and desires of the community for the progress of the company and the community in the future as material for discussion and consideration for the company to be realized in the future through Community development programs (CD) and Corporate Social Responsibility (CSR). The proposal of this program is not all based on the expectations of the community above, but also based on the problems faced by residents.

List of legal documents, regulatory permits and property deeds related to the areas assessed

Tabel 8. List of legal documents, regulatory permits and property deeds related to the areas assessed

No	List of Document	Certificate Letter	Agency	Area
1	Information on PT PALJ Location	No. 503/3109/II-BAPPEDA, Tanggal 17/12/2012	Regent Sintang	19.400
2	Location Permit	No. 525/ 91/ KEP - PERTANAHAN/ 2013, tanggal 29/02/2013	Regent Sintang	19.400
3	Change of Location Permit	No. 525/ 945/ KEP – PERTANAHAN/ 2013, tanggal 11/11/2013	Regent Sintang	13.900
4	Environment permit	No. 660.1/ 1713/ KEP – BLH/ 2014, Tanggal 08/12/2014	Regent Sintang	13.900
5	Plantation Business Permit	No. 525/ 1355/ KEP – DISHUTBUN/ 2015, tanggal 28/05/2015	Regent Sintang	11.128
6	Location Permit Extension	No. 525/ 355/ KEP – PERTANAHAN/ 2016, tanggal 18/04/2016	Regent Sintang	13.900

3.2. HCV Assessment

3.2.1. National and or regional context

A key area of biodiversity is a nationally identified area that has global significance. Several international organizations have identified key areas for biodiversity with their respective criteria. Several key areas of internationally recognized biodiversity include:

- **Ramsar Sites**; in Kalimantan, there are two (2) Ramsar Sites of Tanjung Putting National Park in Central Kalimantan and Danau Sentarum National Park in West Kalimantan. Based on map of distribution of conservation areas and protected forest areas, the location of permit area of PT PALJ has a long distance from both areas and is excluded in the ramsar site.
- **Heart of Borneo;** is a regional initiative involving 3 countries namely Malaysia, Brunei and Indonesia. The HoB iniative actually are conservation areas located in the central part (heart) of Borneo Island. Areas HoB in Indonesia included Danau Sentarum National Park, Gunung Palung National Park, Bukit Baka Bukit Raya National Park, Betung Kerihun National Park and Kayan Mentarang National Park. The location of the PT PALJ license area is excluded in the HoB area
- **Important Bird Area (IBA)**; the nearest important birds distribution area is Danau Sentarum National Park located in eastern and at the distance of ± 41,51 kilometers.
- **Endemic Bird Area (EBA)**; the nearest endemic bird distribution area is a part of Kehuma protected forest located in the eastern and northern from permit area of PT PALJ and located at the distance of ± 10 kilometers.
- **Ecoregion**; Based on the West Kalimantan Biophysiographic map, it is divided into 5 (five) types of Ekoregion: Upper Kapuas Basin, Muller Mountains, Middle Kapuas Basin, Western Plains and Mountains and Southern Plains and Mountains. Location permit location of PT PALJ is included in Ecoregional Meratus Structural Plain,Meratus Structural Hills and Meratus Structural Mountain.
- **Distribution of Orang Utans**; Based on the Map of Distribution of Orang Utan (www.forina.or.id), the part of permit area of PT PALJ's included in the orang utan distribution areas. Although there were no indications or findings indicating the presence of orangutans during field survey. This information is reinforced by interviews with local communities. However, the indication of the existence of Orang Utan is important to be concerned by PT PALJ.
- **Protected Forest Area, in t**he northern part of the permit area of PT PALJ is directly adjacent to Mt Kehuma Protection Forest. Protected Forest has a primary function as land and water conservation, but it also serves as a protected area for flora and fauna. This is because the protected forest has relatively good land cover condition.

Based on the description above shows that in the location permit location of PT PALJ is not found conservation area, in the location permit area potential species are found to be the global concern of Orang-utan (*Pongo pygmaeus*); there is a wildlife migration corridor within the landscape between the location permit and the Kehuma Protected Forest. The location permit area is not within the Important Bird Area (IBA) and Endemic Bird Area (EBA) coverage, but is directly adjacent to Kehuma Mountain

Protection Forest. Thus, in the national and regional context, the location permit location of PT PALJ provides an important support function for the surrounding protection area. But with the identification of HCV in the concession area of PT PALJ and future management and monitoring action plans are expected to contribute significantly to the conservation of biodiversity,environmental services and socio-cultural values of communities at regional and national levels. Supporting regulations and local government regulations related to conservation and HCV are: West Kalimantan Provincial Government Regulation no. 10 of 2014 on West Kalimantan Provincial Spatial Plan, Year 2014-2034.

3.2.2. Landscape Contexs

Land Cover

Based on the Landsat Imagery 8 OLI Band 654 Path/Row 120/59 ETM Satelite images covered 2014 and 2015 analysis, land cover in the landscape of the study are 6 (six) main land cover types: (1) secondary forest, (2) Rubber plantation, (3) Mixed dryland farming, (4) Oil Palm, (5) Shrubs and (6) Open Area. Meanwhile land cover within the concession area of PT PALJ can be divided into 4 (four) types, namely 1). Secondary forest, 2). Rubber plantation, 3). Old shrubs and 4).Mixed dryland farming. Where the land cover in the concession area dominated by mixed dryland farming and rubber plantation types. Around of the permit area of PT PALJ contains primary forest in the northeast on the form of Protected Forest (Kehuma Mt Protected Forest) and secondary forests within the location permit area of PT PALJ. Inside the location of permit area of PT PALJ is found any forested area, while the forested area around the location permit area is located directly adjacent to the concession area. Therefore, in the study landscape, there is possible to connectivity.

Land Use at the National Level

Based on Map of Forest and Water Bodies in West Kalimantan Province, scale 1 : 250,000 (Decree of Forestry Ministry No. 773/Menhut-II/2014), the concession area of PT PALJ is located in APL (*Area untuk Penggunaan Lain = Area for Other Purposes*). According to Sintang District Spatial Planning of 2016-2036, it is located in a APL (Area for Other Purposa), while according to the Indicative Map New Permit Delays (PIPPIB) Revision IX, concession area of PT PALJ are excluded from the moratorium area.

Land History

Based on the history of the area, the location permit of PT PALJ is a part of the concession area of PT Batasan which conducts the utilization of logs in 1980s. Furthermore, in 1988 the management of production forest in the border area of West Kalimantan including the location permit location of PT PALJ submitted by the Ministry of Forestry to PT JAMAKER. In 1995 the entire area managed by PT JAMAKER was handed over to PERHUTANI in cooperation with PT Delapan-Delapan for forest clearing activities in this case the construction of logging road. In line with the decentralization process, where the forestry sector is experiencing many problems, the area becomes an open area and suffered serious damage caused by illegal logging and encroachment activities and utilized by the community to conduct shifting cultivation as well as pepper plantations (*sahang*) and rubber. In 2014, based on the

Map of Forests and Waters Bodies of West Kalimantan Province Scale 1: 250,000 (SK.733 / Menhut-II / 2014, September 2, 2014) the area becomes another use area.

Physical Environment

Based on watershed boundaries, the location permit area of PT PALJ is located in Kapuas Watershed (Ketungau sub-watershed). Inside the permit area of PT PALJ found as many as 9 (nine) rivers, namely S. Merakai, S. Kemawil, S. Bedau, S. Sekalau, S. Sengarak, S. Jiram, S. Semansar, S. Penian and S. Antu. Conditions and characteristics of rivers and tributaries located around the permit area of PT PALJ indicates that the permit area of PT PALJ is in the upper river area. The rivers are the tributaries of the Ketungau river. The rivers flow into the Ketungau River and then the Ketungau river empties into the Kapuas River.

The location permit area of PT PALJ is included in the type A accordance Schmidth-Ferguson climate classification. Within 10 year (2005-2014), (1951), annual rainfall in the permit area of PT PALJ for 10 years ranges from 2,419 - 3,582 mm, with an average annual rainfall of about 3,063 mm. The annual temperatures in this region also fluctuate, the annual maximum temperatures in the concession area of PT PALJ for 10 years range from 30.74o to 32.69o C, the annual minimum temperature ranges from 23.19o to 23.79o C and the annual average temperature ranges From 26.15o to 27.05o C; While the annual maximum mean temperature is around 31.64o C, a minimum of about 23.44o C and an average of about 26.64o C.

The concession area of PT PALJ is in the lowlands with a height of 36 to 324 meters above sea level. The slope classes that composed both at the landscape scale of the HCV assessment boundary, as well as within location permit scale are 5 (five) slope classes, as presented in **Table 9**. In addition, based on the Erosion Hazard Level (TBE) calculation in the area, potential heavy erosion hazard - very heavy ie hilly area with a slope classes above of D and E.

Table 9. Slope Classes that Composed at the Landcape and Permit Area of PT PALJ Levels

Slope Classes	Permit Area (ha)	Outside of Permit Area (Ha)	Wider Landscape (Ha)
A	11.648,23	25.784,25	37.432,48
B	1.655,93	6.123,31	7.779,24
C	67,31	741,52	808,82
D	82,75	2.740,23	2.822,98
E	445,78	1.196,10	1.641,88
TOTAL	13.900,00	36.585,42	50.485,42

Based on the Land System map (RePPProT, 1988), land systems that composed the at the landscape scale of the assessment boundary and within location permit area of PT PALJ is presented in **Table 10**. Geological formations that composed at the landscape scale of HCV assessment boundary and within location permit area of PT PALJ is presented in **Table 11**. As for the type of soil that is found both at the landcape assessment boundary and within permit area of PALJ is presented in **Table 11**. The

soil types that dominate the location permit area indicate the species that are sensitive to erosion.

Table 10. Land system that composed at the Landscape Assessment Boundary and within Permit Area of PT PALJ

Land system	Litologi	Permit Area	Outside of Permit Area (Ha)	Landscape Boundary (Ha)
Beliti	Alluvium-recent riverine (fresh); Peat	375,75	13.824,23	14.199,98
Beriwit	Sandstone	0	3.351,07	3.351,07
Lawanguwang	Shale Mudstone Sandstone; Alluvium, recent riverine (fresh)	11.008,25	14.709,87	25.718,12
Mendawai	Peat	0	1857,86	1.857,86
Pendreh	Sandstone Conglomerate shale	1.085,75	351,12	1.436,87
Teweh	Sandstone Shale Mudstone Marl	1.430,25	2.491,27	3.921,52
Grand Total		13.900,00	36.585,42	50.485,42

Table 11. Geological Formation that composed at the Landscape Assessment Boundary and within Permit Area of PT PALJ

SYMBOL	FORMATION	Permit Area (Ha)	Outside of Permit Area (Ha)	Landscape Boundary
Toms	Batuan Malihan Pinoh	205,57	675,80	881,37
Qa	Aluvium	-	2.036,22	2.036,22
Teke	Ketungau	13.694,43	29.585,58	43.280,00
Tetu	Tutoop Sandstone	-	4.287,82	4.287,82
		13.900,00	36.585,42	50.485,42

Table 12. Soil Type Formation that composed at the Landscape Assessment Boundary and within Permit Area of PT PALJ

Soil Type	Permit Area	Outside of the Permit Area	Landscape Boundary
Alluvial	808,43	257,55	1.065,98
Podzolic Red Yellow	12.344,33	35.782,01	48.126,34
Podzol	747,24	545,85	1.293,09
TOTAL	13.900,00	36.585,42	50.485,42

Biodiversity

The island of Borneo is an island that has several types of tropical habitats that are rich in biodiversity. Location of concession area of PT PALJ located on the island of Borneo where it cannot be separated from the wealth of the ecosystem. As an illustration, the wealth of terrestrial mammal species on the island of Borneo is 225 species and 44 species of which are endemic (Payne et al., 2000); 639 species of birds, 358 species of which are settlers and 37 species of which include endemics (MacKinnon et al. 2000) 166 species of snakes (Stuebing, 1991), amphibians as much as 140 to 150 species (Inger and Stuebing, 1997); and freshwater fish of 394 species and 149 species of which are endemic (MacKinnon et al., 1996). Some unique species of wildlife inhabit this island, namely Borneo Orang Utan (*Pongo pygmaeus*), Bekantan (Nasalis larvatus), Honey Bear (*Helarctos malayanus*), Leopard (*Neofelis diardi*) and Sempidan

Kalimantan (*Lophura bulweri*). Judging from the distribution of the animals, the location of the study included the distribution of wildlife species facing high levels of extinction, the Endangered and Critically Endangered categories. Animal species that are spread in the study area and include the precarious category are the turtles (*Heosemys spinosa*) and the critical category are Pangolin (*Manis javanica*).

The primate species of global concern on the island of Borneo are Orang Utans, known only to be concentrated in some areas of Borneo. According to the Orang Utan distribution map of the Indonesian Orang Utan Forum (www.forina.co.id) 2014, part of the PT PALJ permit area is included on the Orang Utan distribution. In the location permit area of PT PALJ found protected wildlife species according to PP no. 7 in 1999 as many as 15 species, with details: mammals as many as 6 species and birds of 9 species.

Based on to the protection status, 8 plant species are protected status according Government Regulation of Indonesia No. 7, 1999 and 10 species of plants are included in the CITES Appendix II List and 22 plant species included in IUCN Red List List, with details: 15 types of plants including LC / Least Concern category (low risk); 2 types of plants including category VU / Vulnerable (vulnerable) and 5 types of plants including category EN / Endangered (precarious).

In Kalimantan, it has more than 3,000 species of trees, including 267 Dipterocarp species, the most important timber tree group, of which 58% of Dipterocarp species are endemic. Also, it has more than 2,000 species of orchids and 1,000 species of ferns, as well as a distribution center of carnivores *Nepenthes*. The rate of flora endemism is also quite high around 34% of all plants, but has only 59 unique genera of 1,500 genera. The existence of the study site on the island of Borneo allows the existence of several species of endangered flora and is protected by Indonesian legislation, mainly the trees of the Dipterocarp family (*Shorea spp*. *Dipterocarpus spp*.). In addition to the trees of the Dipterocarp family, there are several other species of flora, such as the *Nephentes spp*. All species of plants are protected by the Indonesian government based on the Decree of the Minister of Agriculture No. 54/Kpts/Um2/1972 and Decree of the Minister of Forestry No.261/Kpts-IV/1990. On the other hand, the tree species are widely used for commercial timber, mainly because they are the kinds of trees that serve the interests of local communities. Plant species that are spread in the area of study and are covered under Government Regulation no. 7 of 1999 are *Nepenthes spp.* and tengkawang (*Shorea pinanga*); While the endanger category Tengkawang Layar (*Shorea smithiana*).

Protected Forest and Conservation Areas

At the landscape assessment boundary, the northern part of permit area of PT PALJ have directly adjacent to Kehuma Protection Forest. There is no detailed information about Kehuma Protected Forest, however, as the main function of Protected Forest is as an area of protection of land and water that plays an important role for subordinate areas. Operationally, the management of Gunung Kehuma Protected Forest under the Sintang District Forestry Office. No conservation areas and other protected forests are found.

At the landscape scale there are other protected forest areas which are the area of endemic bird distribution within 10 km; with an important bird distribution area of approximately 41.51 km and with the spread of orang utan is approximately approximately 44 - 45 km. In this regard, the permit area of PT PALJ provides an important support function for the surrounding protected areas. Conservation Areas located on a wider landscape scale in the form of Natural Park TWA Mount Baning and Gunung Kelam with a distance of approximately 70.48 km. Danau Sentarum National Park is located on the east side of the location permit PT PALJ with a distance of approximately 46.80 km. Thus, then the location permit location of PT PALJ does not provide an important support function for the surrounding conservation areas, so that the operational activities of oil palm plantations in the region will not affect the major biodiversity areas in the landscape.

The existence of large mammals on the island of Borneo in this case Orang Utan (*Pongo pygmeus*) is potential found in the location permit area of PT PALJ. The landscape of the area has been changed to shifting cultivation and residential areas, although there are forest spots that allow for temporary shelter for wildlife, especially for bird species. A possible migration corridor opportunity is to connect between the HCV areas within the PT PALJ area with Kehuma Protection Forest.

Ecosystem

He whole areas of PT PALJ location permit are included in the Kalimantan lowland forest ecosystem with mixed *dipterocarpaceae* forest. Based on the history of the area, since the 1980s, the location permit location of PT PALJ and surrounding areas is a lowland forest area that has been exploited by logging companies. After the end of its forest concession period, the area is not managed and becomes an open area resulting in illegal logging activities and is also used for cultivation with shifting cultivation system by the community. Thus causing damage and degradation of lowland forest ecosystems in the region.

Social, Economic and Cultural

Six villages have been identified in and around the location permit area of PT PALJ that are potentially affected by the development project namely Wirayuda village, Swadaya village, Margahayu village, Wana Bhakti village, Senangan Kecil village dan Mungguk Gelombang village. The original tribe located in the villages around the permit location PT PALJ are the Dayak Ketungau and Dayak Iban.

Dayak Ketungau and Dayak Iban still have customary rituals, such as traditional ceremonies that are still thick is a traditional *"gawai"* ceremony that is held after the harvest ("*syukuran"*). In addition, they also still believe in the things that are mystical and unseen in a region. The belief in the mystical things has implications for the preservation of the area indicated to contain HCVs. The main economic activities of the community around of the concession area are rubber farming, pepper farming, paddy fields, hunting, fishing and collecting non-timber forest products (NTFPs) from forest areas. Generally, local people rely heavily on river networks and springs located in hilly areas for their water needs, including drinking water.

In survival, the Dayaks of Ketungau and Iban live mostly in agricultural cultivation such as cultivating rice fields, rubber, corn and pepper. In addition, hunting and gathering of forest products is also kept by a small part of the community. Currently, Dayak Bakati people have stepped forward with many of them working in government agencies as well as private employees and living life as traders.

3.2.3. Decisions on presence or absence for all six HCV categories

Based on the assessment of High Conservation Value (HCV) in the permit area of PT PALJ, in there are identified of 6 (six) HCV categories, cosisting 7 (seven) HCV subcategories and 1 (one) HCV Potential sub categories, namely HCV 1 (HCV 1.1, HCV 1.3 and HCV 1.4) and Potential HCV 1.2, HCV 2, (HCV 2.2. & 2.3), HCV 3, HCV 4 (HCV 4.1 and HCV 4.2), HCV 5 and HCV 6, Total HCV Area in PT PALJ **3.207,50 Ha**. The results of this assessment are summarized in **Table 13.**

Table 13. HCV Identification Summary in PT PALJ Area

HCV	Definitation	Present	Potential	Absent
1	Concentrations of biological diversity including endemic species, and rare, threatened or endangered (RTE) species that are significant at global, regional or national levels.			
1.1	Areas that contain or provide support functions for biodiversity protection and / or conservation areas			
1.2	Critically Endangered Species			
1.3	Areas that Contain Habitat for Viable Populations of Endangered, Restricted Range or Protected Species			
1.4	Areas that Contain Habitat of Temporary Use by Species or Congregations of Species			
2	Intact forest landscape, large-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.			
2.1	Extensive landscape areas that have the capacity to maintain ecological processes and dynamics			
2.2	Natural Areas that Contain Two or More Contiguous Ecosystems			
2.3	Areas that Contain Representative Populations of Most Naturally Occurring Species			
3	Rare, threatened, or endangered ecosystems, habitats or refugia			
4	Basic ecosystem services in critical situations including protection of water catchments and control of erosion of vulnerable soils and slopes.			
4.1	Areas or ecosystems that are important as water providers and flood control for downstream communities			
4.2	Areas important for erosion control and sedimentation			

HCV	Definitation	Present	Potential	Absent
4.3	Areas that function as natural barriers/breaks to prevent the spread of forest or land fires			
5	Sites and resources fundamental for satisfying the basic necessities of local communities or indigenous peoples (for example for livelihoods, health, nutrition, water), identified through engagement with these communities or indigenous peoples.			
6	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			

3.2.4. HCV and HCV Deliniation

Total HCV area in the permit area of PT PALJ of 3,207.50 Ha or ± 23.08% of the total permit area 13,900.00 Ha, with details: rivers border area of 675,64 Ha, Hill area of 451,44 Ha, Bufferzone Kehuma Mt Protected Forest area of 298,58 Ha, forested area of 191,54 Ha, Area with potential for Heavy-Weight erosion of 1.555,28 Ha and Area to Cultural Site, covering 35,02 Ha. To improve management effectiveness, PT PALJ establishes the HCV management area (High Conservation Value Management Area - HCVMA) which is concentrated in 3 (three) locations ie 1). forested area, area of 1,002.24 Ha, 2) Kendang hills area of 1,461.17 Ha and 3). Buffer zone Kehuma Mt Protected Forest area of 666,64 Ha, as presented in **Table 14.** Distribution of HCV area within the permit location of PT PALJ is presented in **Figure 24.**

Table 14. Total HCV Area and HCVMA in the Permit Area of PT PALJ

No.	Location	HCV Attributes	HCV Area	HCVMA
1	Rivers and it's border	HCV 1, HCV 2, HCV 4 and HCV 5	675,64	675,64
2	Kendang Hill area	HCV 1, HCV 4, HCV 5 and HCV 6	451,44	1.461,17
3	Bufferzone Kehuma Mt Protected Forest	HCV 1, HCV 2, HCV 4 and HCV 5	298,58	666,64
4	Forested Areas	HCV 1, HCV 2, HCV 3 andHCV 6	191,54	1.002,24
5	Height-Weight Erossion Potential	HCV 4, HCV 5 and HCV 6	1.555,28	
6	Cultural site areas	HCV 6	35,02	35,02
Total HCV areas			**3.207,50**	**3.840,71**
Permit Area of PT PALJ			**13.900,00**	13.900,00
Percentage HCV Area to Total Permit Area			**23,00%**	**27,63**

Interpretation of the findings that led to decisions on HCV presence/absence. It is key that all decisions on HCV presence/absence are adequately justified and supported by evidence

HCV 1. Species Diversity

HCV 1.1. Areas that contain or provide support functions for biodiversity protection and / or conservation areas

HCV 1.1 is the existence of areas established for the purpose of biodiversity conservation, either within or adjacent of the location permit area of PT PALJ. Based on the result of HCV assessment shows that the location permit area of PT PALJ is directly adjacent to the Mount Kehuma protected forest. Referring to Presidential Decree No. 32/1990 on the Management of Protected Areas and Government Regulation No. 26/2008 on National Spatial Plans, PT PALJ shall establish bufferzone 500 meters wide in areas directly adjacent to those protected forests. The protected areas contained within the permit area of PT PALJ of 1.425,67 Ha, in the form of 675,64 Ha of riparians zone (rivers border), Bufferzone of Gunung Kehuma area of 298,59 Ha and area with slope above 40% of 452,44. In addition to the Protected Area, the establishment of HCVs also considers the condition of forested land cover. Based on landsat image interpretation land cover condition within the permit area of PT PALJ consisting 4 (four) types, namely (1) Secondary forest area of 191.54 Ha (1.38%), (2) Mixed dryland farming of 11,831.87 Ha (85.12%), (3) rubber plantation 1,012.32 Ha (7.28%) and (4) old shrub covering 864,26 Ha (6.22%). All protected areas and areas with secondary forest land cover in the PT PALJ location permit **are designated HCV 1.1**. Total area of HCV 1.1. is **1,617.21 Ha**.

HCV 1.2. Critically Endangered Species

In the permit area of PT Palma Agro Lestari Jaya (PT PALJ) was found as many as 222 species that can be grouped into 65 families. Of these, no plant species were found to be included in the CR / *Critically Endangered* (critical) category under the IUCN. Referring to the protected status of Government Regulation Number 7 Year 1999 as many as 23 species (8 plants species and 15 wild animals species); included in the list of 20 CITES species and all included ***Appendix II*** (10 plant species and 10 wild animal species); including the VU / *Vulnerable category* (vulnerable) according to the IUCN Red List of 3 species (2 plant species and 1 wild animal species) and belonging to the EN / Endangered 5 (plant) category. Species of flora and fauna with critically endangered status are not found in the licensing area of PT PALJ. Based on the *Orang Utan* Distribution Map of the Indonesian Orangutan Forum (www.forina.or.id) 2014, the part of PT PALJ's location permit is included in the *Orang Utan* distribution area. Although the results of field surveys and interviews with the community were not found indication of the existence of orangutans, however, the location permit location of PT PALJ has potential or potential as *Orang Utan* habitat.

Considering with precoutionary approach, it can be concluded that the location permit area of **PT PALJ potential containing of the HCV 1.2.** Distribution of potential areas are expected to survive as an habitat area from the critically endangered species presented in **Figure 10.**

HCV 1.3. Areas that Contain Habitat for Viable Populations of Endangered, Restricted Range or Protected Species

The existence of HCV 1.3 is characterized by the presence of threatened flora and fauna species, limited spreadin (endemic), and/or protected. Species to be considered in HCV 1.3 included all of species identified in HCV 1.2 Nearly Extinct Species and added other species that are considered endangered, vulnerable, limited distribution (on an island or part of it) or protected by the Government of Indonesia (protected species). Within permit area of PT PALJ found 8 plant species that are protected according PP. 7 of 1999 or other regulations; 10 plant species included in the CITES List Appendix II, and found 2 plant species including the VU / *Vulnerable* category and 5 plant species including EN /*Endangered* category according to IUCN. In the permit area of PT PALJ also found one plant species that includes endemic Kalimantan Island that is *Kapur* (*Dryobalanops beccarii Dyer*). In the permit area of PT PALJ found 15 wildlife species with status protected according to PP. 7 of 1999 (6 mammals species and 9 birds species); included in the list of CITES Appendix II as many as 10 species (4 mammals species, 3 birds species and 3 reptiles species), and one species including VU / *Vulnerable*. In the permit area of PT PALJ found one endemic wildlife species in the Borneo Islan namely *Lutung merah / Kelasi (Presbytis rubicunda*).

These protected / threatened plant and wildlife species are expected to survive in a habitat area of 1.617,2 Ha. Therefore, within the permit area of **PT PALJ found areas containing HCV 1.3.**

HCV 1.4. Areas that Contain Habitat of Temporary Use by Species or Congregations of Species

The objective of HCV 1.4 is to identify keystone habitats in a landscape in which species individual congregation exists in a very large number and/or is used temporarily. Examples for the keystone habitat are: (i) breeding or nesting ground, such as cave or wetland habitat for several bird and bat species; (ii) places situated along the main migration line; or (iii) local wildlife corridor through which individuals can move between different ecosystems in search of food with seasonal availability. Keystone habitat can also take form of refugia for a species during drought, flood and land fire. Key habitat in the permit area of PT PALJ is a forested area in Merakai river border, Bufferzone of Gunung Kehuma Protected Forest and Secondary Forest which has relatively close canopy closure with high canopy very important role for bird species as perch place to rest or feed for some bird species from the family *Accipitridae.* The types of wildlife identified using the location of permit area of PT PALJ as part of its habitat are generally bird species. The bird species that utilizes a portion of the location permit area is the Elang Ular Bido (*Spilornis cheela*), which is the Family *Accipitridae*. Elang Ular Bido usually take advantage of high-titled plants for both resting and waiting for prey (*steppingstones*).

Therefore it can be concluded that within the permit area of **PT PALJ containing of HCV 1.4.** The areas of HCV 1.4. overlapping with HCV 1.1, potentially HCV 1.2 and HCV 1.3 areas.

HCV 2. Intact forest landscape, landscape-level ecosystems and mosaics

HCV 2.1. Large Natural Landscapes with the Capacity to Maintain Natural Ecological Processes and Dynamics

The existence of HCV 2.1 is characterized by intact forest landscapes (> 50,000 hectares) and core areas of the landscape. The core area is defined as a reserved area to ensure that natural ecological processes can take place without interruption due to fragmentation and the influence of opening area (edge effect). The core area is determined by size (> 20,000 hectares) plus the buffer area around it i.e., at least three (3) kilometers from the opening area. Location of concession area of PT PALJ is not adjacent to the intact forest landscape. The intact forest landscape lies to the west and southeast of the nearby concession area and is located approximately more than 50 km (www.intactforests.org). Around of the PT PALJ permit area found the existence of core forest area in accordance with the criterion of HCV 2.1 namely Gn Kehuma Protected Forest located in the north and directly adjacent with the permit area of PT PALJ. The area is a Bufferzone (BZ) from the core area of Gunung Kehuma Protected Forest. Although Bufferzone Kehuma Protected Forest in the permit area of PT PALJ is a part of the Gunung Kehuma Protected Forest landscape, but the land cover conditions in Bufferzone area have been severely fragmented due to illegal logging and encroachment activities, so that the buffer zone in the permit area of PT PALJ (bufferzone Protected Forest Gn Kehuma) can not function as a reserved or necessary area to ensure that natural ecological processes can take place uninterrupted by fragmentation and the influence of edge areas. Referring to some justifications for the findings of the HCV 2.1 criterion, **the location permit area of PT PALJ does not contain of the HCV 2.1.**

HCV 2.2. Natural Areas that Contain Two or More Contiguous Ecosystems

Based on the results of GIS analysis and field survey shows that the ecosystem in the past (before the conversion) found in and around the permit area of PT PALJ as much as 3 (three) types (*1) Lowland forest of sandstone; (2) Association of mixed dipterocarpaceae forests of metamorphic rock and mixed dipterocarp forests over granite rocks; and (3) Lowland forests of alluvium soils*. In the past, there were two interconnected ecosystem types with ecotonic boundaries, namely between *(1) lowland for sandstone forest and mixed dipterocarpaceae forest associations over metamorphic rocks and mixed dipterocarp forests over granite rocks*; *(2) mixed dipterocarpaceae forest associations of metamorphic rocks and mixed dipterocarp forests over granite rocks and lowland forests of alluvium soils* and *(3) Between mixed dipterocarpaceae forest associations of metamorphic rocks and mixed dipterocarp forest mixtures of granite rocks and lowland forests ground alluvium.*

Referring to some justifications for the findings of the HCV 2.2 criterion, **the location permit area of PT PALJ containing of the HCV 2.2..**

HCV 2.3. Areas that Contain Representative Populations of Most Naturally Occurring Species

HCV 2.3 aims to identify landscape with special potentials capable of maintaining viability of natural species representative population and assure that the management

activities running in the management unit can maintain or improve the potentials. This HCV assessment strongly requires seeing beyond limit of the management unit to assess how important the interaction is between the population and habitat within the management unit and the surroundings. Based on the results of satellite imagery analysis and field observation (interview and field survey) shows that in the permit area of PT PALJ is known to contain landscapes with special potential that can keep the population alive from representation of natural species. Landscape with such special potential is habitat / habitat part of high predator population such as: Black eagle (*Ictinaetus malayensis*) and *Elang Ular Bido* (*Spilornis cheela*). The types of high-level predators are the types of wild animals that have been able to adapt to disturbed environmental conditions. This condition is indicated by the history of land cover that has experienced relatively long disturbance and the type of feed that is the types of satwaliar that is able to adapt also to the disturbed areas, both terrestrial and aquatic animals. The species of high-level predators come from the *Accipitridae* Family.

In the permit area of PT PALJ contains a landscape with special potential that can keep the population alive from representation of natural species. **Therefore it can be concluded that the permit area of PT PALJ containing of HCV 2.3.**

HCV 3: Ecosystem and Habitat

Existence of HCV 3 is characterized by a rare, naturally anthropogenic, threatened or endangered ecosystem and is classified as threatened in national or international systems (such as the IUCN Red List on Ecosystems). Based on overlapping analysisi result between the location permit map with the Kalimantan biophysiographic map, the permit location of PT PALJ is included in the Middle Kapuas Basin Biofisiografi Unit. The ecosystem found in the permit location of PT PALJ consists of 9 (Nine) types : *1) Lowland forest over sandstone, 2) Association of mixed dipterocarpaceae forests of metamorphic rock and mixed dipterocarp forests over granite rocks, 3) Dipterocarpaceae forest mixed over volcanic rocks, Association of mixed dipterocarpaceae forests of volcanic rock, Mixed dipterocarp forests of metamorphic rocks, and mixed dipterocarp forests of granite rocks, 5) Lowland forests of alluvium soils, 6) Dipterocarpaceae forest mixture of metamorphic rocks, 7) Kerangas forest, 8) Swamp forest, 9) The mixed dipterocarpaceae forest is over the old sea sediments*. Within permit area of PT PALJ is not found rare ecosystems naturally or anthropogenically. Based on the result of overlap between the IUCN Endangered Ecosystem Map of 2013-2015 (www.iucnrle.org) with the biophysiographic map of PT PALJ location, there are no ecosystems that are classified as threatened in national or international systems (such as the IUCN Red List on Ecosystems); but there are three rare and threatened ecosystems *1). Mixed dipterocarpaceae ecosystems of mixed metamorphic and mixed dipterocarp forest mixtures of granite rocks, 2) Mix or hill dipterocarpaceae on sedimentary rocks* with secondary dryland forest natural land cover and *3) lowland forests on alluvium soils* with secondary forests natural land cover. **Therefore, in the permit area of PT PALJ found HCV 3..**

HCV 4 : Ecosystem Services

HCV 4.1. Areas or Ecosystems Important for the Provision of Water and Prevention of Flood for Downstream Communities

The existence of HCV 4.1 is characterized by an important area or ecosystem as a provider of water and flood control for downstream communities such as cloudy forests, ridge forest, riparian ecosystems, karst forests and various wetland ecosystems, including peatlands (especially forested ones), freshwater swamp forest, mangrove forests, lakes and swamps of grasslands. In the concession area of PT PALJ is identified as HCVA areas, as indicated as follows:

Rivers and its borders

Inside the location permit area of PT PALJ found as many 9 (eight) rivers and its border. The main river that flows within the area is the Merakai River that flows to the east and Sekalau river flowing in the west. Small rivers like the Sengarak, Kemawil, Penian and Antu Rivers empty into the Merakai River. Semansar, Bedau and Jiram Rivers empty into Sekalau River. Then the two main rivers flow from north to south and empties into Ketungau River. The width of the rivers in the area ranges from 3 – 20 meters, the width of the borders ranges from 5 – 50 meters, and the length of the rivers ranges from 1,39 – 15,69 kilometers. The rivers in the region during the dry season have never experienced drought and in the rainy season it has never overflowed. In general, land cover in river borders consists of shrubs, mixed rubber gardens, dryland farming, rice fields, settlements and open land. Although it is not forested, the presence of shrubs and mixed rubber plantation that have an important value in terms of slope stability, as well as filters of pollutants from the land. Referring to the Guidelines for Identification of High Conservation Value Areas (2008). then the left-right area of the river is a High Conservation Value Area (HCVA) 4.1. Based on Presidential Decree No. 32 Year 1990, the right-left area of the river is a local protected area through the establishment of a demarcation line width according to government regulations.

Water catchment Area (Hilly Area)

Inside the area of PT PALJ contains the Water Catchment Area is a hilly area of Bukit Kedang with an area of 451,44 Ha and is upstream of the flow of water flowing into Bedau River, Jiram Peniam. The upstream section is utilized to meet the needs of clean water by installing pipes to flow into the village.

Secondary Swamp Forest (Secondary Forest in the Division 3)

Within permit area of PT PALJ found secondary swamp forest ecosystem, this area is not only a swamp but a unity with the existing vegetation. This ecosystem has a role as a retarding basin (water reservoir), which serves as water “park” area, when the river's surface overflows. This change of ecosystem function into another allocation will cause the movement of the outflow to another undesirable area. This secondary swamp forest ecosystem has an area of 21,34 Ha.

Bufferzone of Gn Kehuma Protected Forest

In the northern part of PT Palma Agro Lestari Jaya (PT PALJ) directly adjacent with Kehuma Mt Protected Forest. To maintain the function of protected forest as a water regulator (hydro-orological), it must have a buffer zone area. This area is located within the permit area of PT PALJ that serves the water catchment area (recharge area) that infiltrate the rain water into ground water. It can be concluded that **the permit area of PT PALJ contains HCV 4.1**. with area of 1.447,01 Ha.

HCV 4.2. Areas Important for the Prevention of Erosion and Sedimentation

In this contex, HCV 4.2 area is the area found in a forest or other sound vegetation which grow on the land having potentials of heavy Erosion Hazard Level. Therefore, the management unit activities in the area must be very carefully carried out to assure the prevention of devastating erosion or sedimentation. Area having heavy Erosion Hazard Level potentials is defined as area which will predictably suffer from erosion level of 180 tons/hectare/year or more once the vegetation cover is cleared. In the area of PT PALJ contains potential locations to have TBE in Medium, Heavy and Very Weight categories. This is indicated by the type of soil dominated by red yellow podzolic, where the soil type is highly erosion sensitive according to Minister of Agriculture Decree No. 837 / Kpts / Um/ 11/1980, on slopes of 8% already showing potential heavy TBE. Therefore, according to the regulation (President Decree No. 32 of 1990) that the area up to 40% can still be used for cultivation, except in soil type which is very erosion sensitive (eg litosol, renzina) with slope ≥ 15% Protected (SK Minister of Agriculture No. 837 / Kpts / Um / 11/1980). Based on the Guidelines for Assessment of High Conservation Value Areas in Indonesia (HCV Toolkit of Indonsia), 2008, that the establishment of HCV 4.2. are areas with potential Heavy Erosion (TBE) Weight - Very Heavy. Based on the calculation of potential TBE then **the location permit area of PT PALJ contains HCV 4.2,** an area of 1,555.28 Ha.

HCV 4.3: Areas that Function as a Natural Break to the Spread of Forest or Land Fire

The purpose of the identification of HCVA 4.3 is to determine the area in the form of dry and wetland ecosystems that serve as fuel barriers to prevent the spread of forest and land fires. Some types of ecosystems that can fulfill this function include peat swamp forest with intact peat swamp forest, swamp forests, puddles, other wetlands and green belts with various refractory plants. Based on the interpretation of Landsat Image OLI (Operational Land Imager) Band 6.5.4 Path/Row 120/60 July Coverage of Year 2015 and groundcheck that land cover of PT PALJ is dominated by mixed gardens; besides that there are also old shrubs, secondary dryland forest and old shrubs. The land cover does not indicate an area or ecosystem that has the characteristic as a natural burning sekar that is in the form of stratified stands with high density and humidity and has adequate area. **Thus at PT PALJ does not contain HCV 4.3.**

HCV 5. Sites and Resources that are Fundamental to Meet Basic Needs of Local people or indigenous peoples (eg for livelihoods, health, nutrition, water) identified by involvement with such community or indigenous peoples

The community that is the study location generally live in the vicinity of the permit area of PT. Palma Agro Lestari Jaya (PT PALJ). Study area of HCV 5 in PT PALJ includes Wirayuda Village, Swadaya, Marga Hayu, Wana Bhakti, Senangan Kecil and Mungguk Gelombang Villages, Ketungau Tengah Subdistrict. Communities residing in these villages are dominated by the Dayak Ketungau and Dayak Iban. The other tribes are Malay, Javanese, Chinese, Padang and Flores. In general, the villagers around the permit area of PT PALJ has similar characteristics in terms of fulfilling basic needs. Utilization of the area around the concession, especially for rice field farming, rubber and peper gardening, horticulture, crops, utilization of clean water sources, utilization of wood home materials and wooden / charcoal branches for cooking fuel. Analysis of basic needs, such as food (carbohydrates, proteins and fruits / vegetables), water, clothing and boards, firewood, medicines, fodder and cash income, is done by determining the types of needs that can to be met and the level of community dependence on concession area. Based on alternative availability and sustainable utilization, the area that has HCV value 5 in the concession area of PT PALJ is the flow of Merakai River, Kemawil River, Bedau River, Sekalau River, Sengarak River, Jiram River, Semansar River, Penian River and Antu River. River water is for the villagers around PT PALJ is the only source of water that is widely used for the needs of drinking water, cooking and toilets, as well as for the purpose of fishing. In addition, on the left and right sides of the river is also widely used by the community to collect craft materials such as *kelinsau* leaves, *tanduk* leaves, *senggang* leaves and rattan, to meet cash money needs. Other activities are farming, gardening, in order to meet the needs of carbohydrates, protein fulfillment and meeting the needs of the board / boat wood, therefore conservation efforts must be continued and minimize damage to the river boundaries and pollution. Based on the description, it is concluded **that in the area of PT Palma Agro Lestari Jaya (PT PALJ) is an area containing HCV 5**.

HCV 6. Sites, resources, habitats and landscapes with significant cultural, archeological, or historical significance globally or nationally, or cultural, economic or religious / sacred values of great importance to local or indigenous peoples, identified through engagement with the population or indigenous peoples.

The original tribe residing in the villages around PT PALJ is the Dayak Ketungau and Dayak Iban. The other tribes are Banjar, Bugis, Java, Flores, China and so on. Dayak Ketungau and Dayak Iban still have customary rituals, such as traditional ceremonies that are still thick is a traditional ceremonial ceremony that is held after the harvest (*syukuran*thanks giving). In addition, indigenous activities that are still implemented are customary activities such as marriage ceremonies, births, deaths, as well as ceremonies of "*sumpah adat*", "*begelak*", *adat temuni, mudas*, and so on which are held every year. *Sumpah adat* (the term = *bersih kampung*) is a ceremony performed if there are certain events or crimes that happen to the village. In addition, the *sumpah adat* ceremony is done because there are citizens who violate the customary oath or use black magic for a particular crime. In order to identify HCV 6 areas in accordance

with these indicators, observations, FGDs or structured interviews, in-depth interviews involving the participation of community leaders in each village around the concession area, has been conducted.

Zoning based on cultural rules

Within permit area of PT PALJ, there is a zoning which is made based on local custom rule, consists: *tembawang*, hill and honey trees (*Coompasia* sp). This culture zonation area located in the *Bukit Kedang* (Kedang Hill) and rivers body within the permit area of PT PALJ. Some plant species such as *Manggeris / Kempas* (*Coompassia* sp), *Pohon Aray*, *Pohon Kayu Ampar Dagak* and *Kayu Marubi* are still considered sacred to the community. The existence of these trees are concentrated in the Kedang Hill.

Distribution of archaeological sites

Inside the concession area of PT PALJ was found the location included in the category of archaeological site distribution of *Batu Guna*, Location of *Batu Guna* on the *Rumah Betang* / Long House (customary house Dayak) located within the permit area. Up to now, the stone is still considered to have a sacred value and trusted community as a symbol or warning to the community that there will be something undesirable, *Seplay* sacred grave (*kuburan keramat Seplay*), *Tabalabi* sacred grave (*kuburan keramat Tabalabi*), *Sungai Ming* sacred grave (*makam keramat Sungai Ming*) and *Lulung Ayau* sacred grave (*makam keramat Lulung Ayau*). Based on the distribution of UNESCO World Heritage Sites in Indonesia, the island of Borneo has not found any areas or areas included in World Heritage sites. Thus, PT PALJ and surrounding areas do not contain World Heritage Site status in Indonesia. Based on the description, it is concluded that in the area of **PT Palma Agro Lestari Jaya (PT PALJ) is an area containing HCV 6**.

3.2.5. Summary of Stakeholder Consultation

To get input from the broader stakeholder against HCV assessment results, then conducted public consultations. Public consultation is carried out through two stages, 1), Public consultation is conducted after completion of the assessment. This activity has been conducted on November 17, 2015, at the Hall of Karya Kasih High School and attended by 34 participants coming government agencies, representatives of community around, head of costumary, head of villages and staffs of PT PALJ. The subjects presented in public consultation include: understanding of HCVs and their categories/subcategories, objectives and benefits of HCV assessment, HCV assessment process, HCV assessment methods, the results of the field observations (biodiversity, environmental services and socio-cultural), the findings/results of HCV assessment along with the map version 1, threats to HCV and the recommendation to HCV management and its monitoring. 2). Public Consultation is conducted after the draft report was completed through Focus Group in each of villages study to get more detailed information from the community. This activity has been conducted from 30 December 2015 – 3 January 2016. Major issues and recommendations from the results of the public consultation with stakeholders and the response of HCV assessment team in the concession area of PT PALJ are presented in **Table 15**.

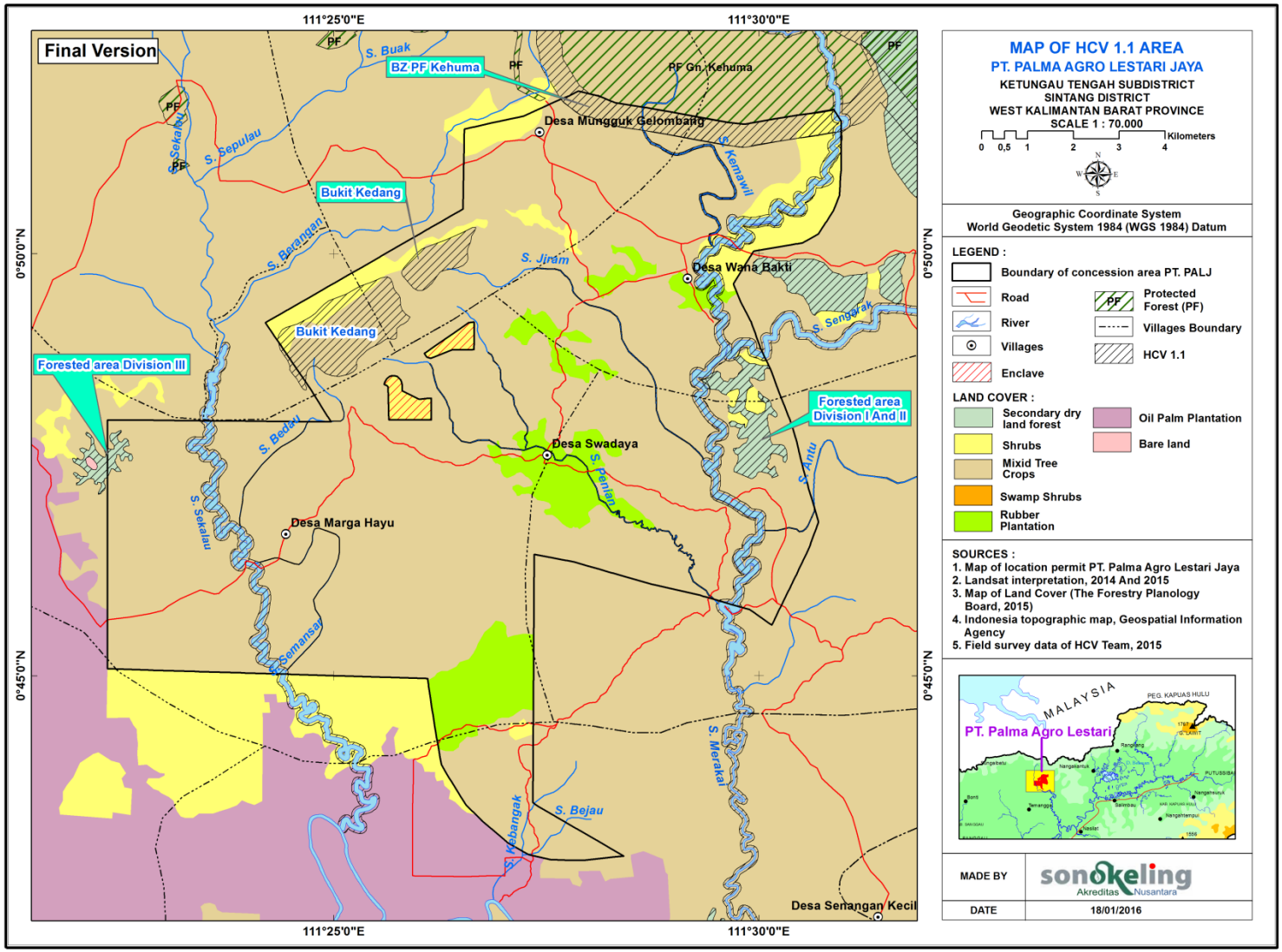


Figure 13. Map of Location and Distribution of HCV 1.1. in the Permit Area of PT PALJ

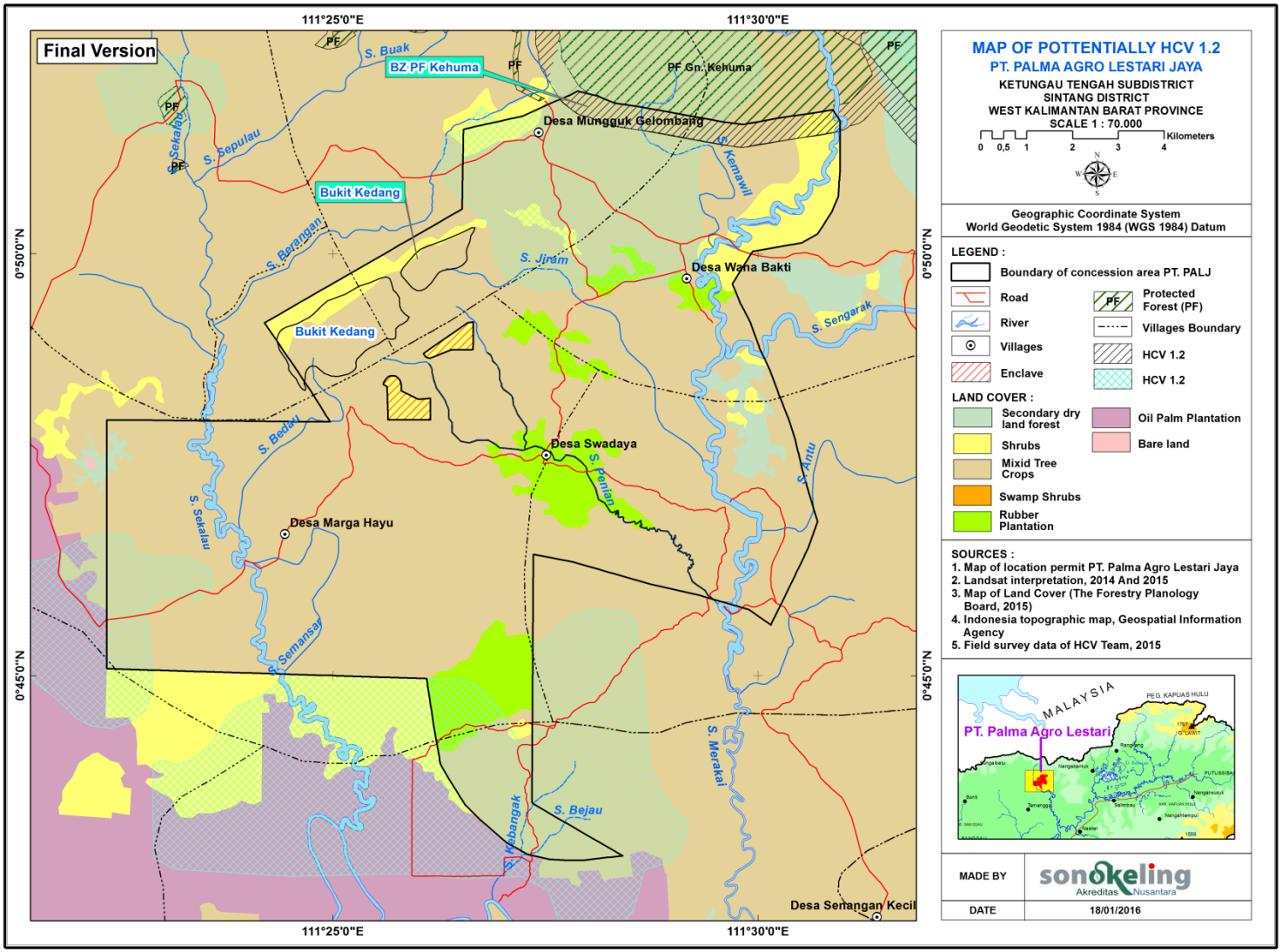


Figure 14. Map of Location and Distribution of HCV 1.2. in the Permit Area of PT PALJ

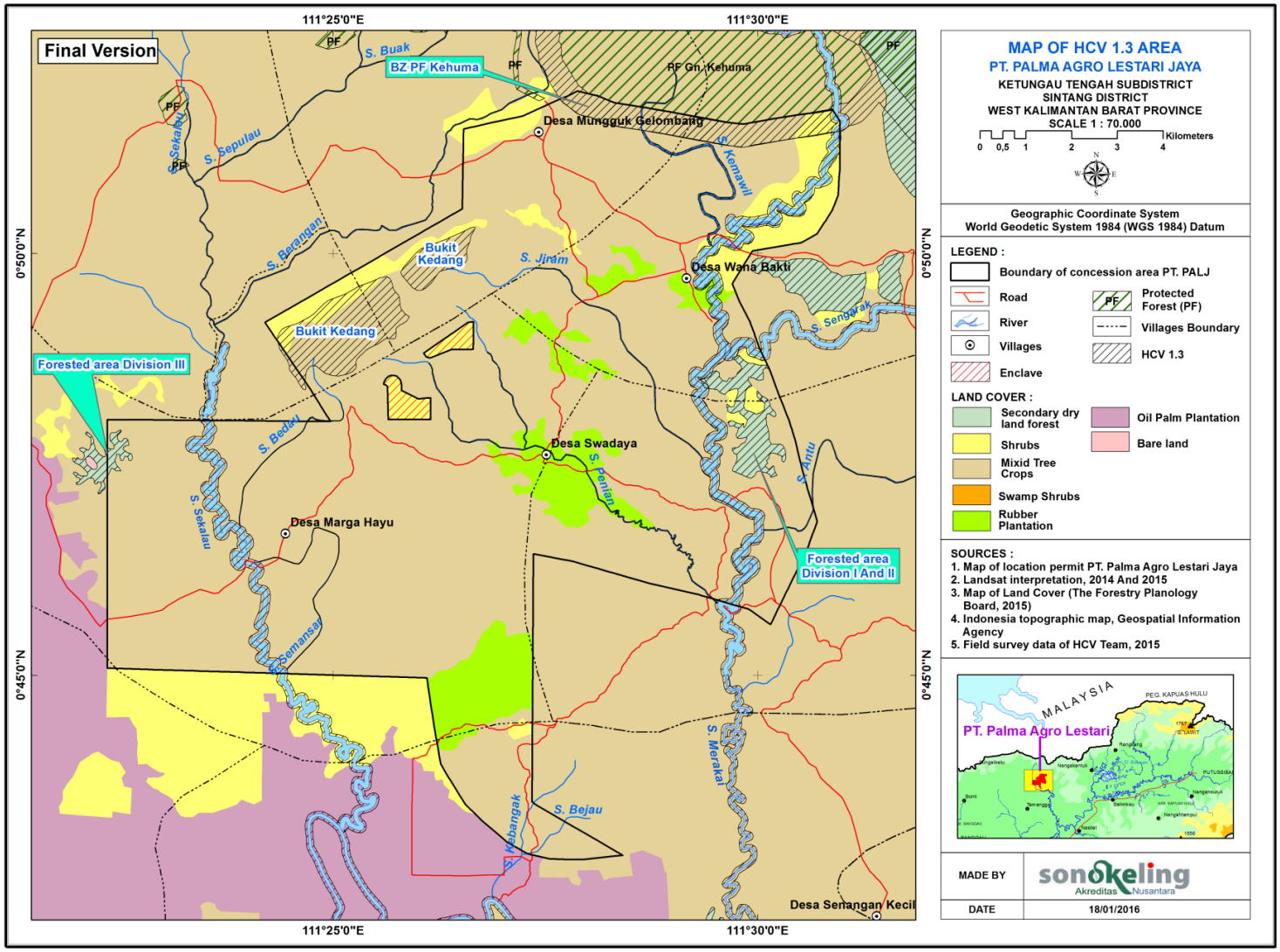


Figure 15. Map of Location and Distribution of HCV 1.3. in the Permit Area of PT PALJ

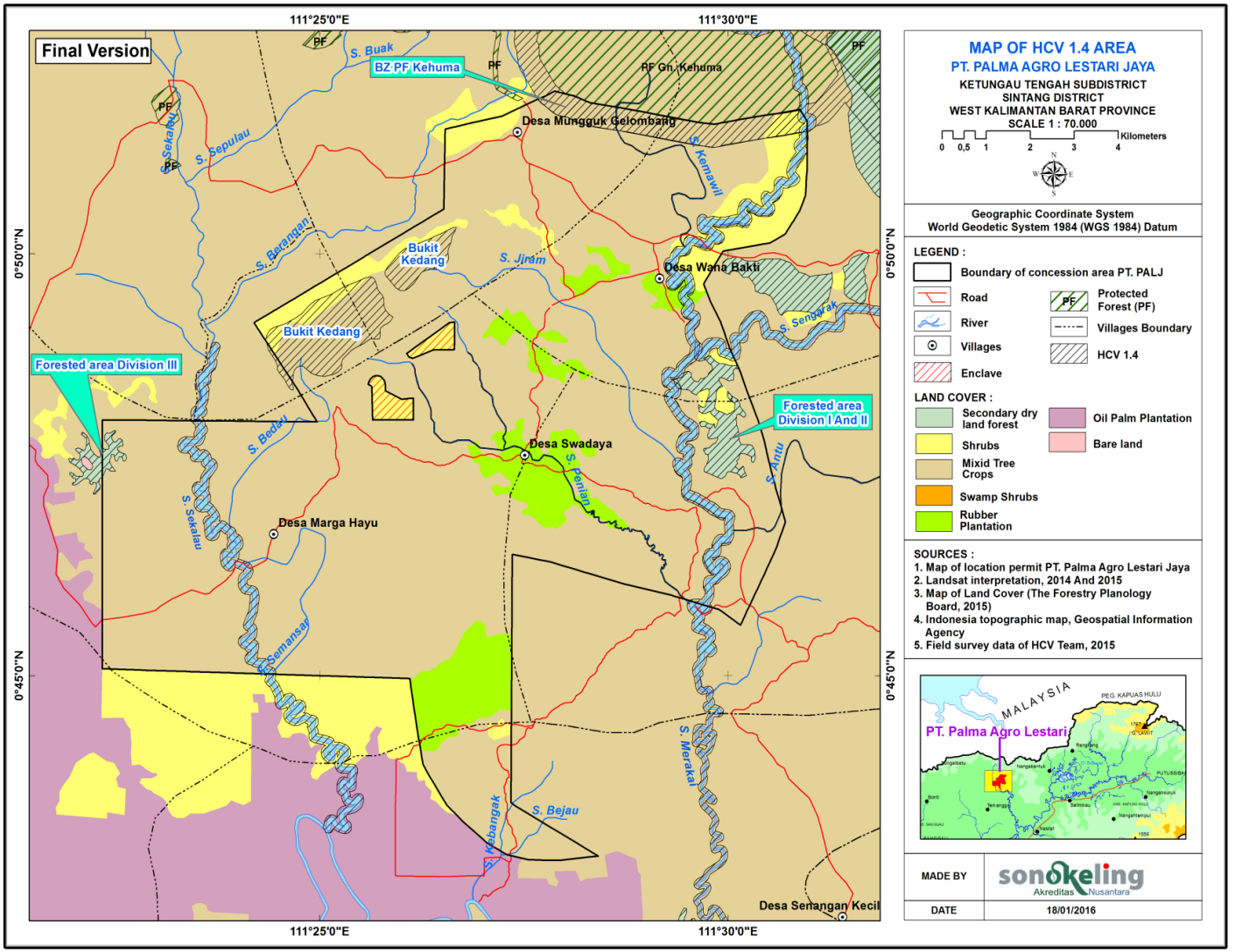


Figure 16. Map of Location and Distribution of HCV 1.4. in the Permit Area of PT PALJ

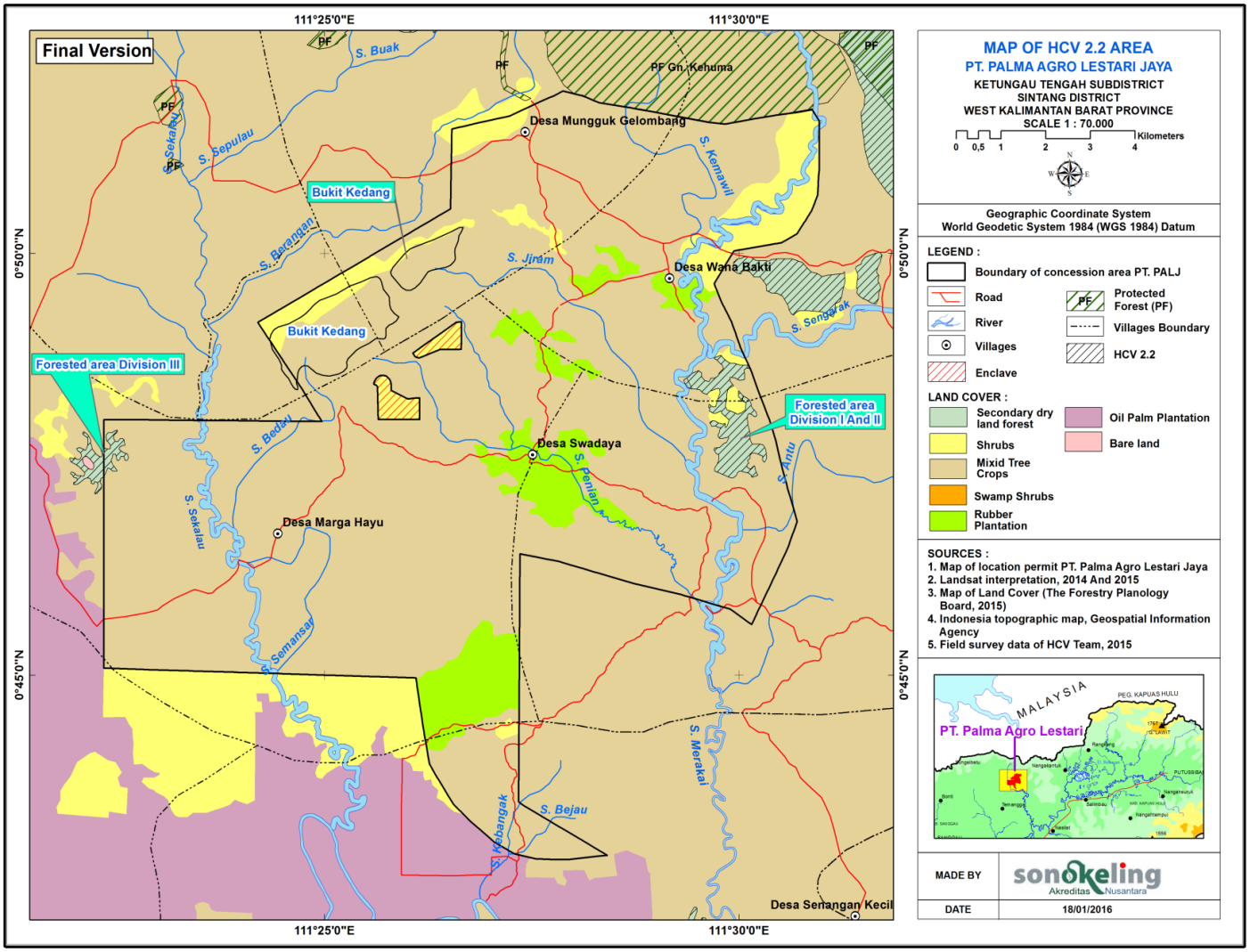


Figure 17. Map of Location and Distribution of HCV 2.2. in the Permit Area of PT PALJ

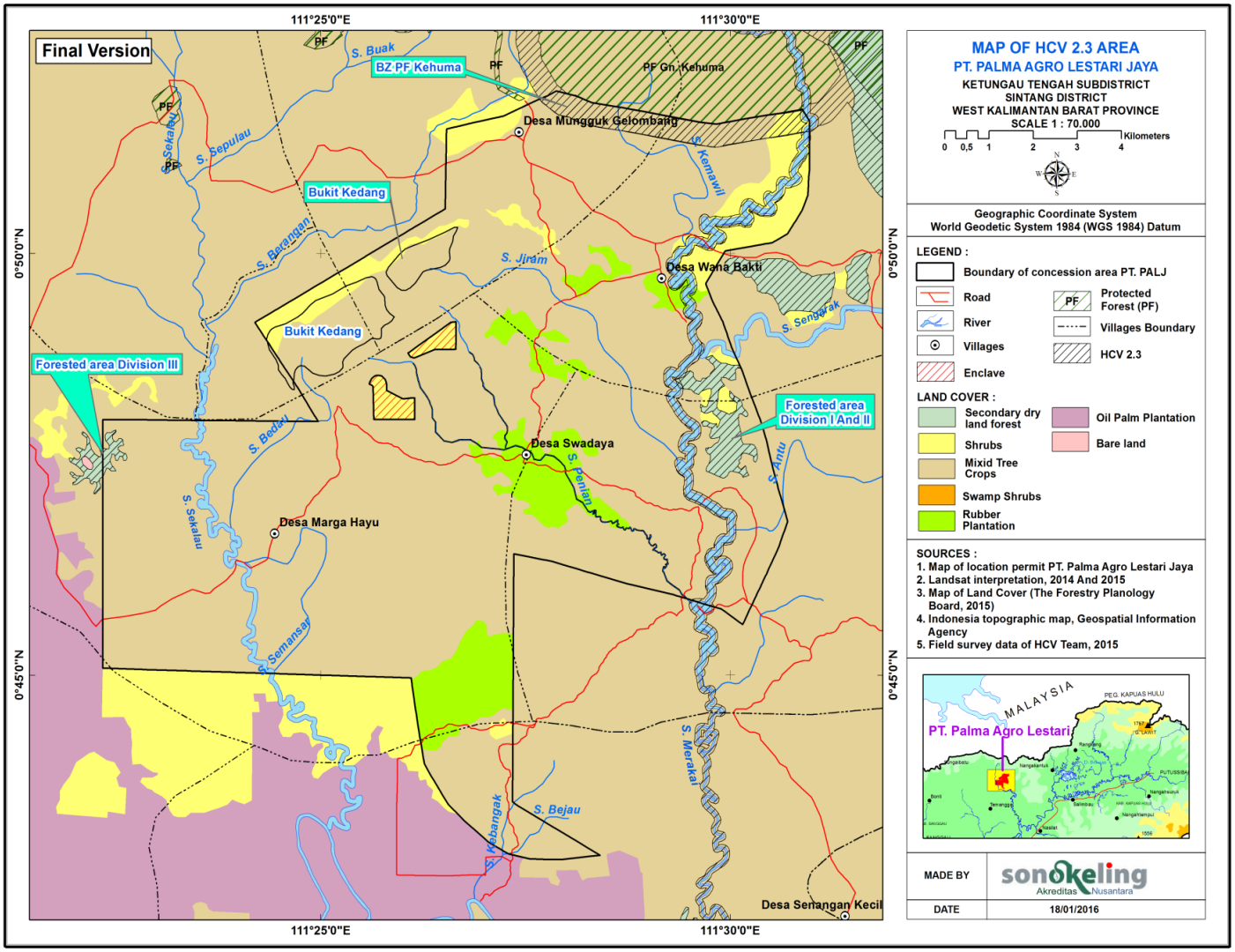


Figure 18. Map of Location and Distribution of HCV 2.3. in the Permit Area of PT PALJ

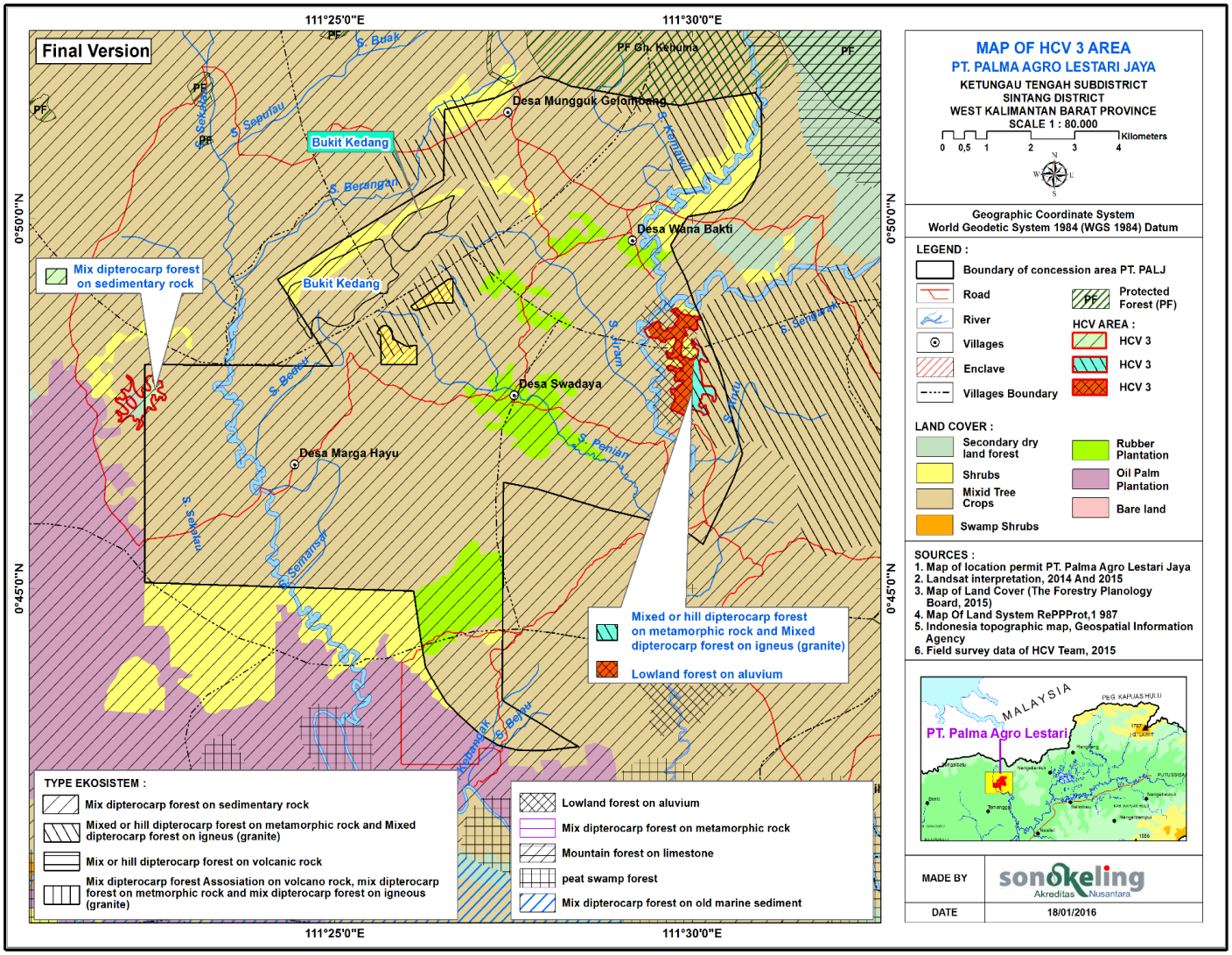


Figure 19. Map of Location and Distribution of HCV 3. in the Permit Area of PT PALJ

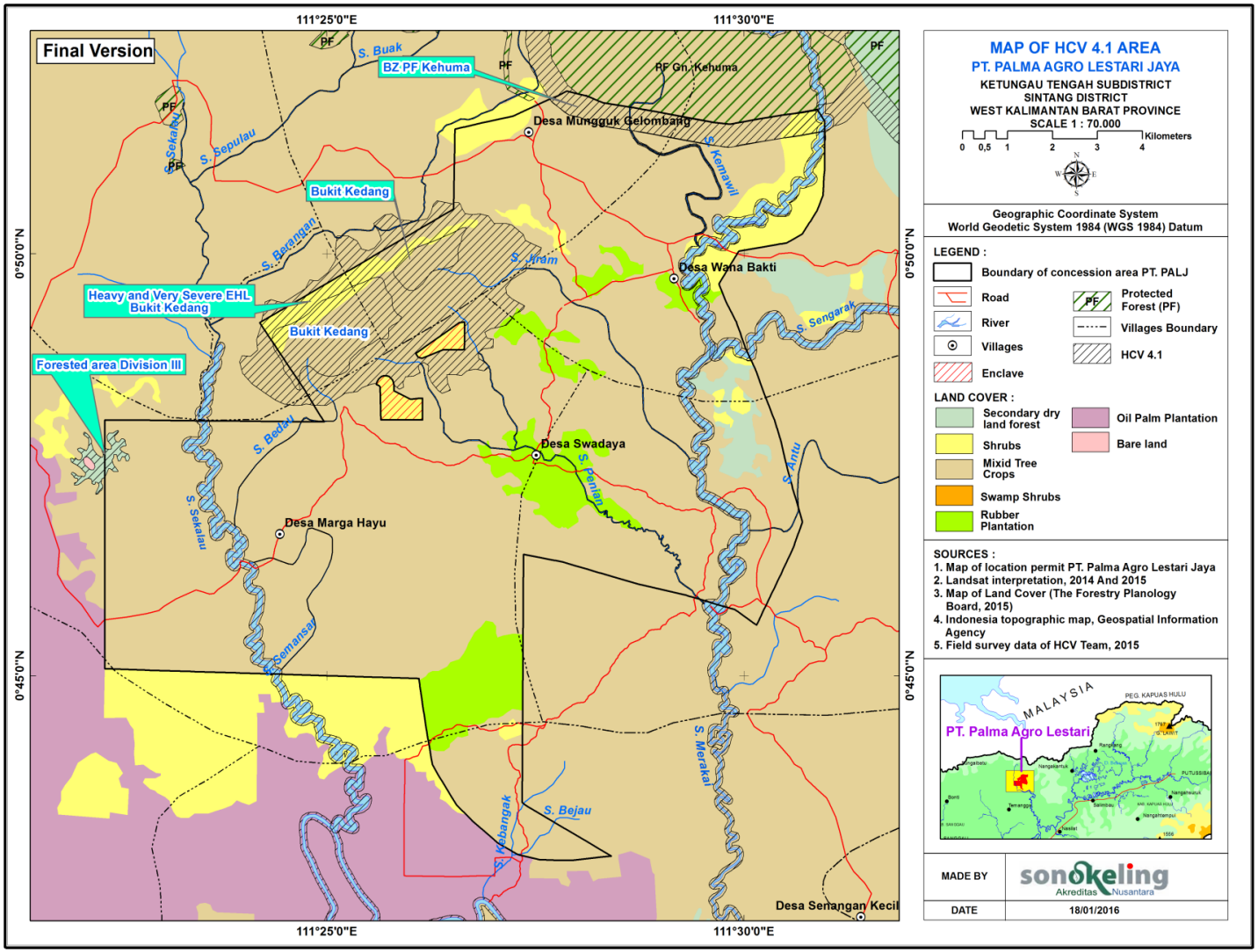


Figure 20. Map of Location and Distribution of HCV 4.1. in the Permit Area of PT PALJ

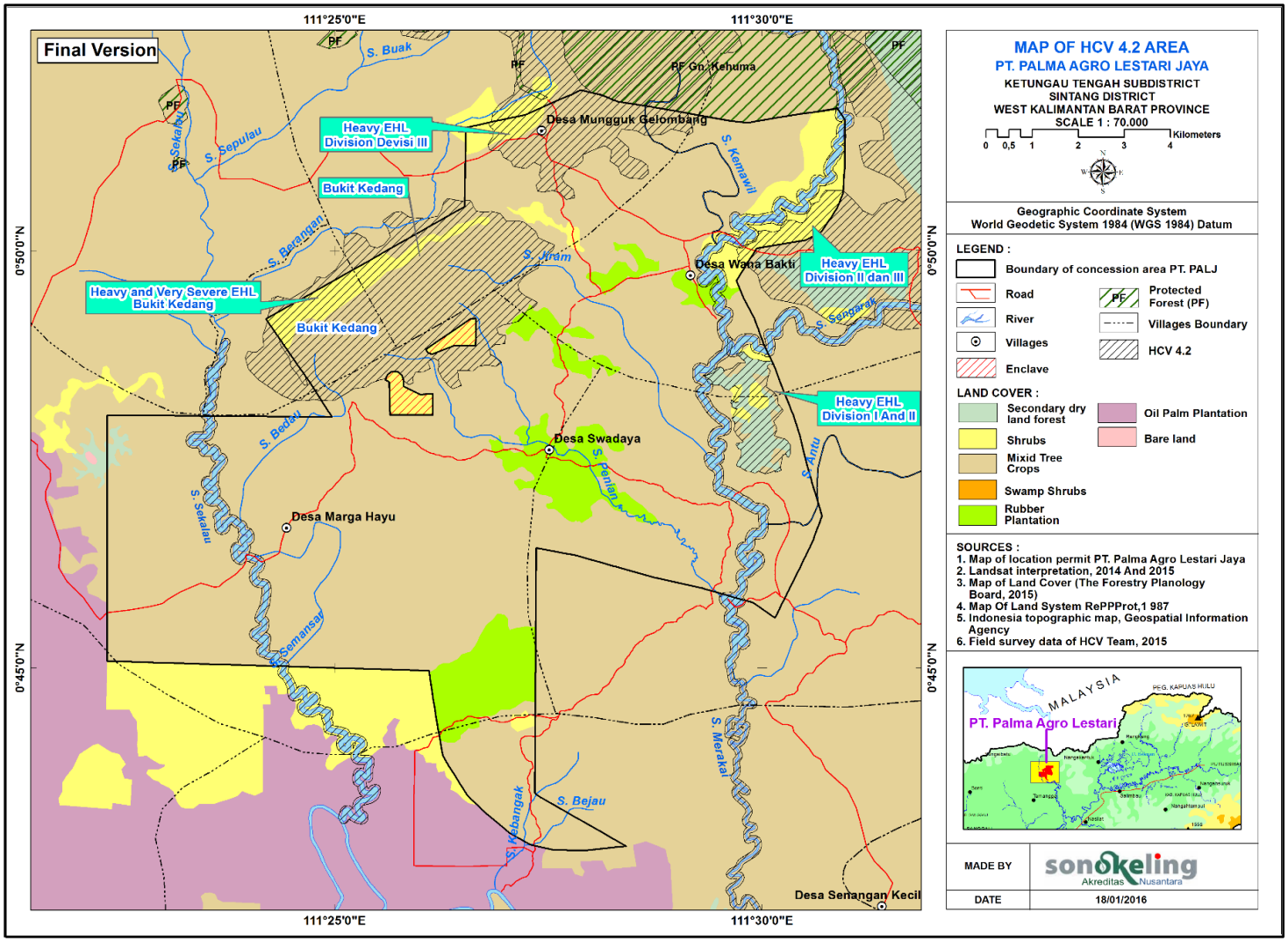


Figure 21. Map of Location and Distribution of HCV 4.2. in the Permit Area of PT PALJ

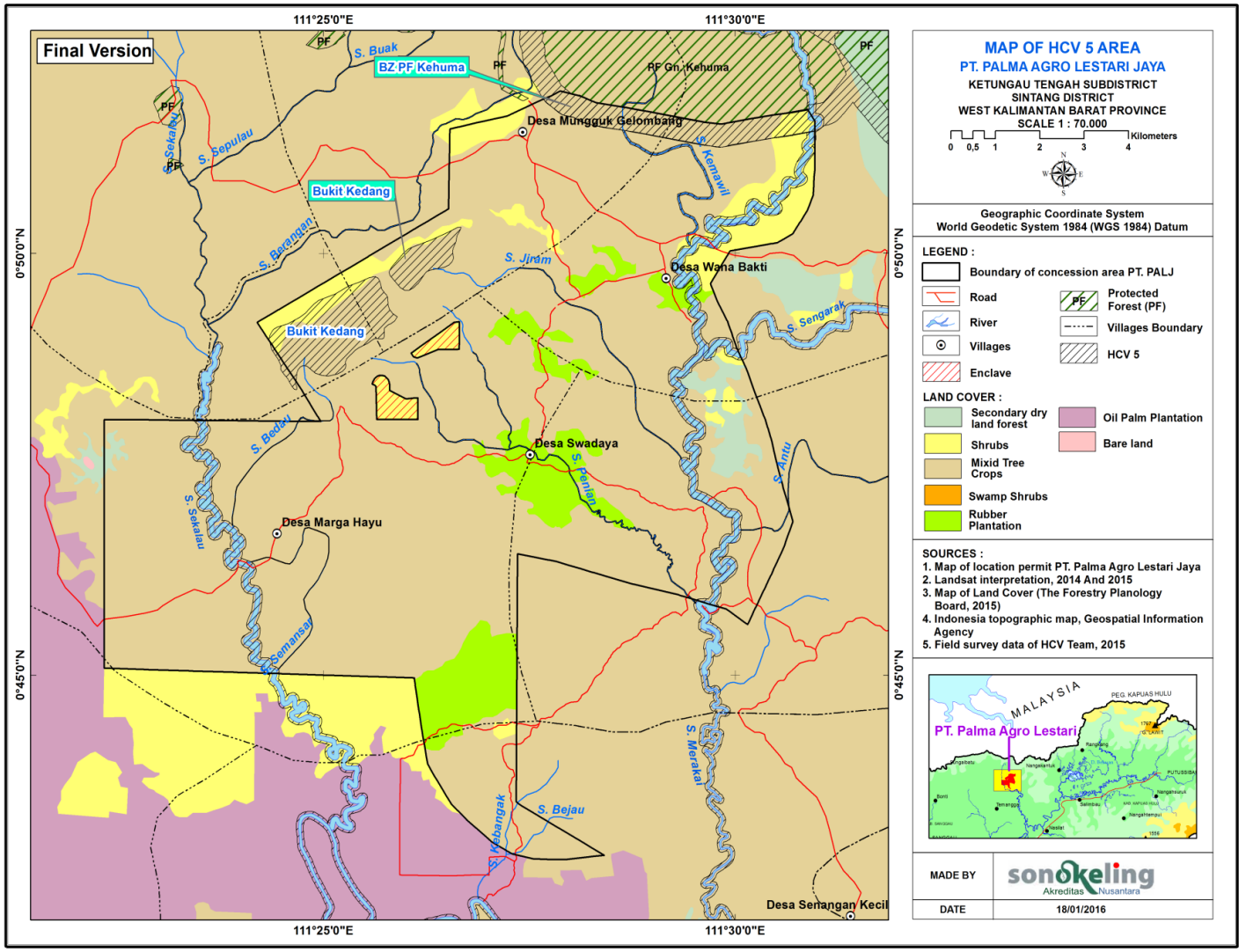


Figure 22. Map of Location and Distribution of HCV 5. in the Permit Area of PT PALJ

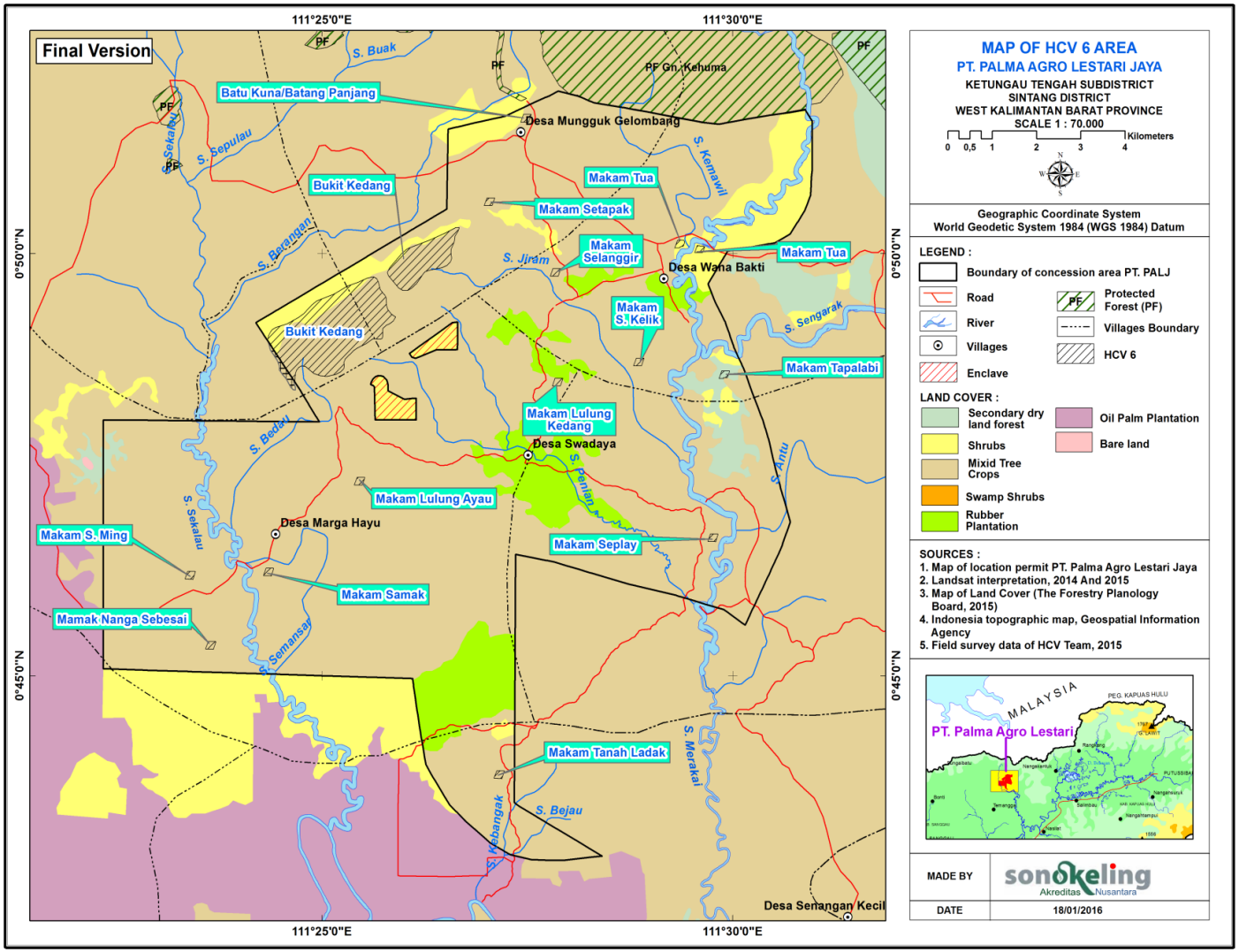


Figure 23. Map of Location and Distribution of HCV 6. in the Permit Area of PT PALJ

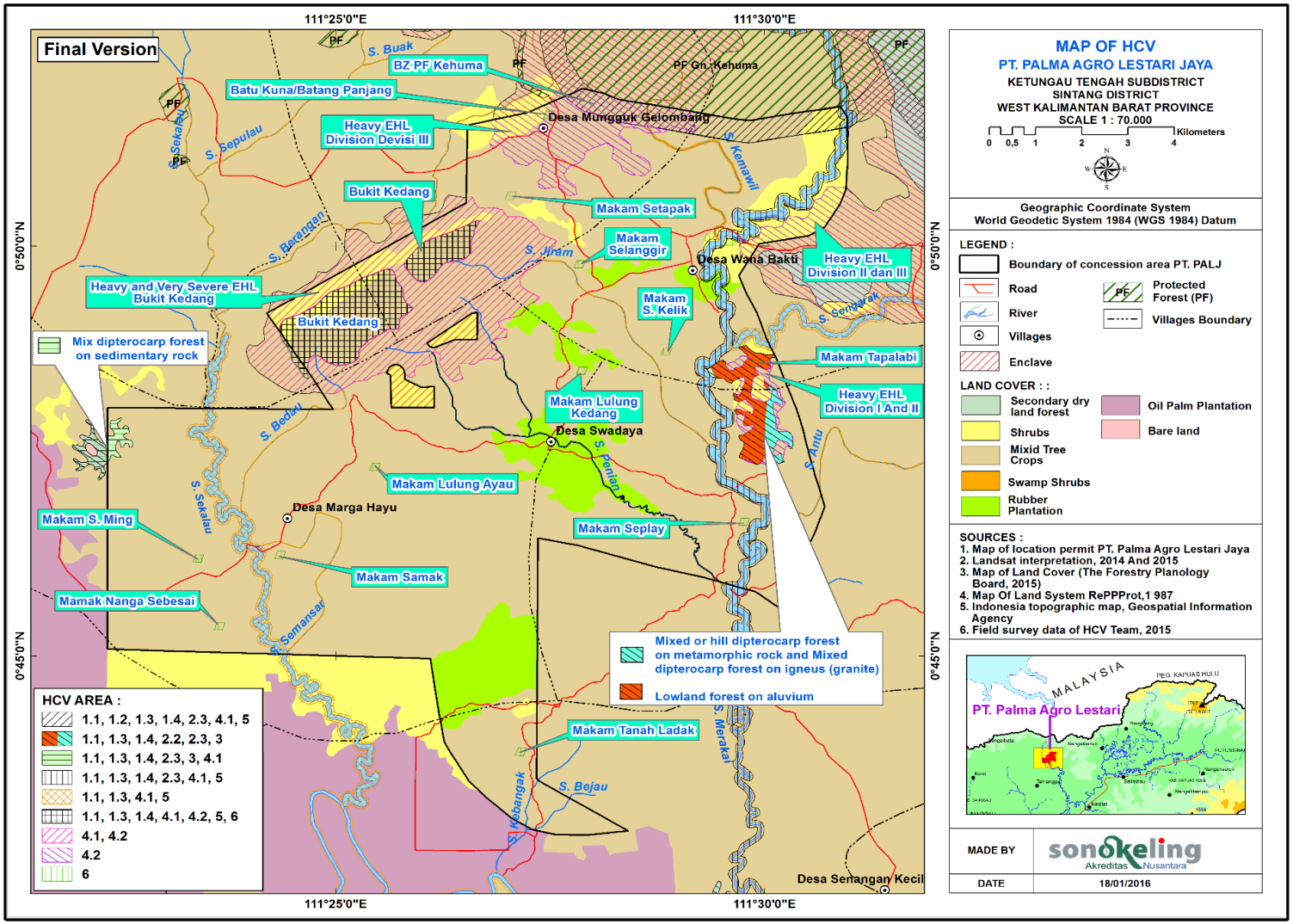


Figure 24. Map of Location and Distribution of All of HCV in the Permit Area of PT PALJ

Table 15. Summary of consultation with stakeholders as well as matters or major issues raised and recommendations proposed

No.	Date & Location	Name	Position/ Role	Organization	Methode	Key Corncern & Recommendation	Assessment Team Response
1	Ketungau Sub District, 17 November 2015	Edi	Head of Customary	Mungguk Gelombang Village	Public Consultation	Bemban swamp near of Kayu Ayau and Kayu Ampar Dagak and Rebong tomb in the Mungguk Gelombang set up as HCV. Tampar Dagak used by community as a place to ask when will do the cultivation and place to ask for rain	This was setting up HCV area
2	Ketungau Sub District, 17 November 2015	Lunjum	Head of Village	Swadaya Village	Public Consultation	Suggestions to the company that not to conduct land clearing activities in the vicinity of the tomb. Expected to be clarified with the data distribution of tombs or shrines	Yes, it is in accordance with FGDs with some village leaders, including customary figures that for the tombs in each village will be enclosed.
							The company also had an initial intention that all tombs and even copper would be enclosed. The explanation of the tomb enclave has been socialized by the company to the local community.
3	Ketungau Sub District, 17 November 2015	Yohannes	Village Secretary	Wirayuda Village	Public Consultation	As a downstream village, it will received an impact accumulation in case of pollution. Is PT PALJ will make water ponds in reducing pollution and land fires	There are SOPs to regulate the environment around PT PALJ, whether related to pollution or related to forest or land fire prevention
							Water sources must be protected, therefore PT PALJ does not dispose of waste into the River
4	Wanabhakti Village, 30 December 2015	Bambang	Kaur Ekonomi & Pembangunan	Wanabhakti	Focus Group Disscusion	Source of clean water for cooking and drinking comes from Petua River, Arak River, Jiram River, Merakai River and Sungai Kemawil. Company should be preserving of the rivers.	All of rivers All rivers have been defined as HCV areas

No.	Date & Location	Name	Position/ Role	Organization	Methode	Key Corncern & Recommendation	Assessment Team Response
5	Wanabhakti Village, 30 December 2015	Benyamin	Head of Nangasran sub village	Wanabhakti	Focus Group Disscusion	The grave is done at the end of the year before Christmas. Graves that want in the enclave like Lubuk Melaban and Tembawang Rambai. In Tembawang Rambai there are langsat, durian, buah sam, kemantan and so on. Also in the tembawang there is an inherited land, because of the inheritance of the ancestors. Around the cemetery and tembawang should not be logged because it can be exposed to customary law. Before land clearing, Company shoud be consultation with community in regards the important areas for basic needs.	PT PALJ will comply with the customory rules adopted by the community and conduct socialization prior to land clearing. Areas where there are graves will be enclave from production activities.
6	Wanabhakti Village, 30 December 2015	Filipus	Head of Empedau sub village	Wanabhakti	Focus Group Disscusion	Near Lubuk Melaban there is a Wood of Merubi that can not be felled. There are restrictions and customary laws that are believed to be violated will be fatal. Therefore people do not dare to cut down. Considering with customary status of the area, Company is expected not to clear of this area.	During land clearing activity, company will involved of the community to avoid areas that are rescued by the community
7	Wanabhakti Village, 30 December 2015	Gregarius Jembri	Head of Mg Mawang sub village	Wanabhakti	Focus Group Disscusion	Honey trees (Koompassia trees) have been cut down and the result is reduced, so there is no residents who work looking for honey. Companies should not cut down the honey tree, in order to increase honey production and become the livelihood of the community.	The company already has a land clearance SOP, in which Kempas tree is the type that will not be felled.
8	Wanabhakti Village, 30 December 2015	Ishak	Head of Kampung Baru 2 sub village	Wanabhakti	Focus Group Disscusion	Whether people can take rattan in the HCV area, because there are some people take advantage of the rattan in the forest that is left for sale.	The Company is still open access in the use of rattan, however, must comply with the specified SOP.
9	Wanabhakti Village, 30 December 2015	Ica	Head of Mg Landak sub village	Wanabhakti	Focus Group Disscusion	In the management of conservation areas (HCVs), companies should be collaboration with communities and conducted socialization about hunted and protected animals status and so that community know where location of the conservation area.	HCV management activities are conducted in an adaptive and participatory manner through community engagement

No.	Date & Location	Name	Position/ Role	Organization	Methode	Key Corncern & Recommendation	Assessment Team Response
10	Wanabhakti Village, 30 December 2015	Yusiphus	Head of Kampung Baru 1 sub village	Wanabhakti	Focus Group Disscusion	The community is not hunting in the area of PT PALJ because there is no more animals being hunted, hunting location is in the forest that is on the border with Malaysia	Hunting activities are still permitted as long as the hunted are the types of animals that are not protected
11	Wanabhakti Village, 30 December 2015	Yuswardi	Head of Wanabhakti village	Wanabhakti	Focus Group Disscusion	The community has already opened the area of the river body, according to the assessment and regulations of the law that the right-left of the river is included in the protected area. How is the solution, so that people get more clear information	The cleared area is a border area of the river, planting with fruit tree species becomes important as a rehabilitation effort
10	Margahayu Village, 31 December 2015	Risi	Village Secretary	Margahayu	Focus Group Disscusion	Clean water for drinking and cooking comes from the Sejaung River, Sungai Tungku, Bedaw River (specifically Dusun Lujuk). Bedaw River, Sekalau River, Semansar River (especially Dusun Pelajar). Sungai Merakit, Belantu River (specifically Belantu hamlet). The company must maintain the condition of the river water so it is not polluted and the social responsibility program is the well to meet the needs of clean water for the community	The company has SOPs and management of riparian areas. The proposal on clean water sources is an input to the company as one of the priorities
11	Margahayu Village, 31 December 2015	Bancik	Community Leader	Margahayu	Focus Group Disscusion	In the cemetery, every tree should not be felled and should not be burned. If want to cut down should be a distance of at least 100 meters. Cemetery Margahayu village there is a large wood called Ayau wood, precisely in the tombs. If deliberate logging in the area is subject to customary sanctions. Companies should be cautious in land clearing and are advised to involve the community in order to avoid violations of prevailing customs	Graves area including the types of plants that exist around it will be dienclave
12	Margahayu Village, 31 December 2015	Niko Dimas	Head of Village	Margahayu	Focus Group Disscusion	The company must disseminate the HCV area and how to manage the area, it is hoped that the community will be involved in order to increase the knowledge of the community. With the involvement of the community, will also provide additional	HCV management activities are conducted in an adaptive and participatory manner through community engagement

No.	Date & Location	Name	Position/ Role	Organization	Methode	Key Corncern & Recommendation	Assessment Team Response
						income.	
13	Margahayu Village, 31 December 2015	Sabtri Agus	Head of Village Representative Body	Margahayu	Focus Group Disscusion	Socialization of the types of animals protected to the community is very important and necessary. In the village of Margahayu still exist as a small community whose job is hunting, with the knowledge there is no hunting of protected species. In the area around the village and the company is no longer found orangutans.	The company will prepare posters on protected animal species and information boards about the status of forest areas
14	Margahayu Village, 31 December 2015	Najan	Head of sub village	Margahayu	Focus Group Disscusion	There are 415 kk which utilize kelinsau leaf and horn leaf for mat material. Needs mats for their own needs. In addition, mat materials such as rattan obtained from the edge of the River Semansar, River Merakit, Bedau River, and Segeriaw River. The company should not open the forest on the edge of the river for oil palm plantations, so that the people who make the mat do not lose their livelihood.	Right-left area of the river is a local protected area and designated as HCV so that land clearing is not carried out.
15	Swadaya Village, 2 January 2016	Parin	Community Leader	Swadaya Village	Focus Group Disscusion	Clean water comes from Ong Kandeh Waterfall which flows through the Penian River. Special Dusun Libuk Nibung and Dusun Terusan Hantu utilize clean water from Sungai Merakai. Companies must be protected areas that have important to meet the needs of clean water for the community.	The site has been designated as the HCV area and the company have responsible to manage this area
17	Swadaya Village, 2 January 2016	Handrianus	Head of sub village	Swadaya Village	Focus Group Disscusion	There is Kayu Merubi. It used to be around the Kayu Merubi wood to meditate on the Centipede King (Thousand foot). Kayu Merubi has fallen and live stumps only wood. But until now it is considered the wood becomes sacred because it can not be cut or impacted. When opening the land, the company must coordinate with the community in order to avoid locations that are still being rescued by the community	The site has been designated as the HCV area and the company have responsible to manage this area
18	Swadaya	Lujun	Head of	Swadaya	Focus Group	The village community hopes that the in the	The proposal has been

No.	Date & Location	Name	Position/ Role	Organization	Methode	Key Corncern & Recommendation	Assessment Team Response
	Village, 2 January 2016		Village	Village	Disscusion	future company can provide health facilities and medical personnel.	accommodated in the Social Impact Assessment
19	Swadaya Village, 2 January 2016	Utia	Costumary Leader	Swadaya Village	Focus Group Disscusion	Indigenous activities that are still carried out are ceremonies that "begelak" open ceremony / "mudas". Traditional "gawai" (ceremony after harvest) led by traditional chairman. The company is also expected to preserve the local culture. In the land clearing activities, companies must be enclave grave areas. The people have great respect for their deceased ancestors by keeping the gravel areas.	During land clearing activity, company will involved of the community to avoid areas that are rescued by the community
20	Mungguk Gelombang Village, 2 January 2016	Empuli	Chair of Village Representative Body	Mungguk Gelombang Village	Focus Group Disscusion	In the Berangan river there is a sacred hollow that is sacred. Six months ago the victim died from dredge the ground in the bottom. Berangan River becomes an area that must be protected.	All of rivers All rivers have been defined as HCV areas and During land clearing activity, company will involved of the community to avoid areas that are rescued by the community
						The people in the dusun Lubuk Payan utilize Berayan River as a source of clean water	All of rivers All rivers have been defined as HCV areas
21	Mungguk Gelombang Village, 2 January 2016	Edi Kurniawan	Co Chair of Village Representative Body	Mungguk Gelombang Village	Focus Group Disscusion	If the concession area will be opened for palm oil and there is Senggang Leaves then the location that has been compensated is not a problem, but if the location of leaf is still in the land owned by the people then it should not be cut.	During land clearing activity, company will involved of the community to avoid areas that are rescued by the community
						On the Bukit Kedang still found hornbills	Bukit Kendang have been defined HCV area

No.	Date & Location	Name	Position/ Role	Organization	Methode	Key Corncern & Recommendation	Assessment Team Response
22	Mungguk Gelombang Village, 2 January 2016	Ramai	Customary Leader	Mungguk Gelombang Village	Focus Group Disscusion	Areas considered sacred by residents such as Bukit Kedang, Gunung Tawa, Lubuk Pentik, Lubuk Larung. Inside Bukit Kedang there are types of Kayu Ayau, and Kayu Tampar Dagak. Wood Tampar Dagak; as a place of traditional ceremonies to ask for heat or rain. When going to open the field (had three times held a traditional ceremony). Under the Kayu Tampar, there is a footprint / small footprints. In Bukit Kedang there is also Batu Nyadi. Ancient Stone comes from humans. Where the ancient stones can be opened if there is an enemy head. The stone can change when there is a problem like changing green (alert). There is a Betang / Long House house as a storage area of the Old Stone (now stored in a box). To open the city must be performed ceremony / gawai, and must kill humans.	Bukit Kendang have been defined HCV area
23	Senangan Kecil Village, 3 January 2016	Yoshep	Village Secretary	Senangan Kecil	Focus Group Disscusion	Inside Sungai Merakai border, community are used for cultivation. In regard to the status of protected areas, what must be done to be understood by the community	The cleared area is a border area of the river, planting with fruit tree species becomes important as a rehabilitation effort
24	Senangan Kecil Village, 3 January 2016	Suparman	Co Chair of Village Representati ve Body	Senangan Kecil	Focus Group Disscusion	There is a free land about 20 hectares to be handed over to the company with the compensation and the MOU has been done in the Kecamatan.	Need to be discuss with company
25	Senangan Kecil Village, 3 January 2016	P Rugin	Customary Leader	Senangan Kecil	Focus Group Disscusion	There is a sacred tomb in Dusun Kedemak Rambai, Seplay grave which is the tombs of parents first (± 50 years ago).	During land clearing activity, company will involved of the community to avoid areas that are rescued by the community
						Customary rules; should not cut down trees around the grave. If when cutting timber on the tomb of elders citizens are subject to custom or on the basis of agreement.	During land clearing activity, company will involved of the community to avoid areas that are rescued by the community
26	Wirayuda Village, 3 January 2013	Henderayana	Village Secretary	Wirayuda	Focus Group Disscusion	Graves or tombs in Dusun Kebangak & Engketik have enclave. However, if the company opened the area it will be subject to	During land clearing activity, company will involved of the community to avoid areas that are

No.	Date & Location	Name	Position/ Role	Organization	Methode	Key Corncern & Recommendation	Assessment Team Response
						custom.	rescued by the community
						Adat that still exists in the village such as adat temuni (its features are wood bangris / Koompasia for honey).	
27	Wirayuda Village, 3 January 2016	Selimun	Village staff	Wirayuda	Focus Group Disscusion	Some residents such as Kebangak Hamlet and Sebetuk Hamlet use the Ketungau River to fulfill clean water for cooking, drinking and toilet facilities. Several Rivers Besides Ketungau River which is still utilized by the water of Kebangak River (inside HGU), Sebetuk River (outside HGU), and Bejaw River (inside HGU). Companies must keep the river water	All of rivers All rivers have been defined as HCV areas
						Traditional ceremonies that are still carried out such as; Gawai Adat, Ceremony when land opening "mudas" is praying to God for work to be safe. Adat Gawai is done once a year. Usually in months 6.7, and month 8 and implemented after harvest for the purpose of alms earth.	During land clearing activity, company will involved of the community to avoid areas that are rescued by the community
28	Wirayuda Village, 3 January 2016	Yohannes Sulistyo	Village Staff	Wirayuda	Focus Group Disscusion	The majority of land rights are obtained from farming. The land can not be opened by others and the land already has a customary certificate (an absolute right). There is a possibility that the fields that have been cultivated will be handed over as plasma to the company. However, if the field is still a forest, it becomes the ulayat right of the people.	

3.2.6. Threat Assessment

Table 16. Threat Assessment in the Permit Area PT PALJ and Around

HCV	Brief Description of Presence Value in the Assessment Area	The main threat
1	**Species Diversity :** • **HCV 1.1.** Protected area in the permit area of PT PALJ consist : Rivers Border Sempadan S. Merakai, S. Kemawil, S. Bedau, S. Sekalau, S. Sengarak, S. Jiram, S. Semansar, S. Penian, dan S. Antu, Bufferzone Gunung Kehuma Protected Forest dan Forested Area • **HCV 1.2.** In the area of permit location PT PALJ has the potential to contain wildlife of global concern and included in critically endangered namely Orang Utan (*Pongo pygmeus*) • **HCV 1.3**. found 8 plant species protected by PP no. 7 of 1999 or other regulations; 10 plant species included in CITES Appendix II; and found two types of plants belonging to the category VU / Vulnerable and 5 plant s[ecies included EN / Endangered (precarious) according to IUCN. Found 15 wildlife species (6 mammals species and 6 bird species) protected under PP. 7 of 1999; 10 species of wild animals (4 mammals species , 3 birds species and 3 reptiles species) included in the CITES List Appendix II, as well as 1 mammal species including VU / Vulnerable (vulnerable) • **HCV 1.4.** Species HCV 1.4: Rat Eagle (*Elanus caeruleus*) and Snake Eagle (*Spilornis cheela*).	**Internal Threat:** • Land clearing through / beyond the HCV area will cause habitat fragmentation and disruption of HCV area functions. • Road Construction and other facilities that pass through / over HCV areas will cause fragmentation and destruction of habitats for plants and wildlife and the disruption of HCV. • Road construction caused in easier access to HCV areas, so that HCV areas become vulnerable to disturbance. • Decreased river water quality due to land clearing • Conflict of employees with orangutans and other wildlife whose is protected, endemic and threatened status. • Orangutan hunting because it is considered a pest for oil palm plantations. • Planting exotic and / or invasive plant species, so it can spread and invade HCV areas which can ultimately damage the habitat for plants and wildlife. **External Threat** • Development road cross country. • Illegal logging and encroachment (illegal clearing of land and fields) as a result of the absence of recognition from relevant parties regarding the boundaries and existence of HCV areas and the lack of understanding of the importance of conservation of plant and animal habitats. • The loss of land cover in the river border • The existence of forest conversion as a result of RTRWP or RTRWK changes that do not consider the existence of HCV areas, thus eliminating the existence of habitat for plants and wildlife. • Forest and land fires that can damage habitat for plants and wildlife. • Conflict of community with orang utan, due they are considered as a pest for cultivated plants • Wild animal included orang utan hunting whose is endangered, endemic, rare and endangered status. • Illegal gold mining activities on the Sengarak and Merakai Rivers that can cause damage to the river border • Weak of law enforcement.
2	• **HCV 2.2.** found forested areas in the two interconnected ecosystem types with continuosly boundary (ecoton) between mixed dipterocarpaceae forest associations over metamorphic rocks and mixed dipterocarp forest over granite rocks with lowland forests above alluvium soils.	**Internal Threat:** • Land clearing through / beyond the HCV area will cause habitat fragmentation and disruption of HCV area functions. • Construction of roads and other facilities that pass through / over HCV areas will cause fragmentation and destruction of plants and wildlife habitats and the disruption of HCV. • Road construction caused in easier access to

HCV	Brief Description of Presence Value in the Assessment Area	The main threat
	• **HCV 2.3.** Landscape with such special potential is habitat / habitat part of high predator population such as: Elang Ular Bido (*Spilornis cheela*).	HCV areas, so that HCV areas become vulnerable to disturbance. **External Threat** • Development road cross country • The occurrence of illegal logging and encroachment (illegal clearing of land and fields) as a result of the absence of recognition from relevant parties regarding the boundaries and existence of HCV areas and the lack of understanding of the importance of conservation of plant and animal habitats. • The existence of forest conversion as a result of RTRWP or RTRWK changes that do not consider the existence of HCV areas, thus eliminating the existence of habitat for plants and wildlife. • Forest and land fires that can damage habitat for plants and wildlife. • Weak of law enforcement.
	• **HCV 3.** In the permit area of PT PALJ is found to be a rare and threatened ecosystem that is still a natural vegetation (forested area) in a mixed dipterocarpaceae ecosystem of mixed ecosystems of metamorphic rocks and mixed dipterocarpaceae forests of granite rock and lowland forests of alluvium soils, and which includes threatened areas forested on lowland forest ecosystems over sandstone.	**Internal Threat:** • Land clearing through / beyond the HCV area will cause habitat fragmentation and disruption of HCV area functions. • Roads Construction and other facilities that pass through / over HCV areas will cause fragmentation and destruction of plant and wildlife habitats and the disruption of HCV. • Road construction caused in easier access to HCV areas, so that HCV areas become vulnerable to disturbance. **External Threat** • The occurrence of illegal logging and encroachment (illegal clearing of land and fields) as a result of the absence of recognition from relevant parties regarding the boundaries and existence of HCV areas and the lack of understanding of the importance of conservation of plant and animal habitats. • The existence of forest conversion as a result of RTRWP or RTRWK changes that do not consider the existence of HCV areas, thus eliminating the existence of habitat for plants and wildlife. • Forest and land fires that can damage habitat for plants and wildlife. • Weak of law enforcement.
4	**Ecosystem Services** **HCV 4.1.** • **Rivers, tributaries and it's border**. 2 (two) main rivers namely Merakai river and Sekalau river. 7 (seven) tributaries : Sengarak, Kemawil, Penian & Antu rivers disembogue to Merakai river. Semansar, Bedau and Jiram rives disembogue to Sekalau river. Both of Merakai and Sekalau rivers disembogue to Ketungau river. • **Water Catchment Areas**, In the permit area of PT. Palma Agro	**Internal Threat :** • Construction of roads and other facilities that pass through / over HCV 4.1. areas. • Uncontrolled land clearing by contractors causes damage to areas that have HCV. • Reduced river water quality due to land clearance, leaching / fertilizer runoff & pesticides or other pollution from oil palm plantations entering rivers. • Hoarding and deflection of streams • The occurrence of silting the rivers caused by uncontrolled land clearing **External Threat:** • Low understanding of the community and

HCV	Brief Description of Presence Value in the Assessment Area	The main threat
	Lestari (PT PALJ) is bufferzone Kehuma Protected Forest, which functions as a water management arrangement and a water catchment area (recharge area) that infilts rainwater into ground water. In the location permit area of PT PALJ there is Bukit Kendang which plays an important role as water catchment area for downstream area. • **HCV 4.2** The area designated as HCV 4.2 in the permit area at PT PALJ is Areas with very high Erosion Hazard (TBE) potentials are hilly areas of Kedang	employees about the significance of HCV 4 areas, • The occurrence of illegal logging activities and the encroachment of the area as a result of the lack of understanding of the community about the importance of the conservation of HCV. • Forest and land fires that may cause loss or loss of functional areas containing HCVs. • Law enforcement. • Illegal gold mining activities on the Sengarak and Merakai Rivers can lead to degradation of river water quality and siltation.
5	**HCV 5.** Based on alternative availability and sustainable use, the area that has HCV 5 value in the concession area of PT PALJ is the flow of Merakai River, Sungai Kemawil, Bedau River, Sekalau River, Sengarak River, Jiram River, Semansar River, Penian River and Antu River. River water is for the villagers around PT PALJ is the only source of water that is widely used for drinking water, cooking and toilets, as well as for fishing.	**Internal Threat :** • Construction of roads and other facilities that pass through / over HCV 5 areas. • Uncontrolled land clearing by contractors causes damage to areas that have HCV 5. • Reduced river water quality due to land clearance, leaching / fertilizer runoff & pesticides or other pollution from oil palm plantations entering rivers. **External Threat :** • Low understanding of the community and employees about the significance of HCV 4 areas. • The occurrence of illegal logging activities and the encroachment of the area as a result of the lack of understanding of the community about the importance of the conservation of HCV 5. • Forest and land fires that may cause loss or loss of functional areas containing HCV 5. • Law enforcement. • Houshold waste disposal • Illegal gold mining activities on the Sengarak and Merakai Rivers can lead to degradation of river water quality and siltation.
6	**HCV 6.** Indigenous activities that are still implemented are customary activities such as marriage ceremonies, births, deaths, as well as ceremonies of "*sumpah adat*", "*begelak", adat temuni, mudas*, and so on which are held annually. Sumpah adat (the term = *bersih desa*) is a ceremony performed if there are certain events or crimes that happen to the village. In addition, the customary oath ceremony is done because there are citizens who violate the customary oath or use black magic for a particular crime. There are types of trees that are believed to have power (sacred)	**Internal Threat** • Construction of roads and other facilities that pass through / over HCV 5 areas. • Uncontrolled land clearing by contractors causes damage to areas that have HCV 6. • Closed community access to sites believed to be cultural and sacred identity according to the community. **External Threat** • The occurrence of illegal logging activities and encroachment of the area as a result of the absence of recognition from related parties about the boundaries and the existence of areas that have cultural value. • The existence of forest conversion as a result of RTRWP or RTRWK changes that do not consider the existence of HCV areas, thus eliminating the existence of areas with cultural values. • Forest and land fires that can damage areas of cultural value. • Law enforcement

3.3. Soil and topography

Description and soil clasification

Based on the Land Taxonomy Criteria (USDA, 2010) and its equivalent to the National Classification System (BBSDL, 2014), the land units are classified in morphogenesis to the land type category (subgroup) based on morphological data from field observations obtained as follows Table 17 and Figure 25):

Table 17. Land clasification in the PT. PALJ

Ordo	Sub Ordo	Group	Sub Group	Area (Ha)
Inceptisol	Udepts	Dystrudepts	Typic Dystrudepts	6.311,82
	Aquepts	Endoaquepts	Typic Endoaquepts	438,71
		Epiaquepts	Typic Epiaquepts	67,31
Entisol	Psamments	Ustipsamment	Aquic Ustipsamment	29,17
			Typic Ustipsamment	329,10
	Aquents	Fluvaquents	Typic Fluvaquents	80,09
		Epiaquents	Typic Epiaquents	986,46
Ultisol	Aquults	Endoaquults	Typic Endoaquults	35,89
	Udults	Hapluudults	Typic Hapludults	5.481,97
		Plintuhudults	Typic Plinthudults	95,11
Histosol	Saprist	Haplosaprist	Typic Halplosaprists	25,48
	Fibrist	Haplofibrist	Typic Haplofibrist	18,90
			Total	**13.900**

Based on Table 11, the most extensive type of soil in PT. PALJ is the soil type of the Inceptisol and Ultisol orders of 6,311.82 ha and 5,481.97 ha respectively. The results of compiling the Land Map based on terrain analysis and field validation with landform as the main differentiator, then the land in the location of PT. PALJ is grouped in 40 Land Map Units (Table 18 and Figure 26**).**

Table 18. Land Map Units Description in PT. PALJ

SPT Number	Description of Land Map Unit	Area	
		Ha	%
1	Aquic Ustipsamment- Sedimentary rock plains, wavy to wavy-silt, mudstone, sandstone, new (fresh) river deposits, 3 - 8%	29,17	0,21
2	Typic Dystrudepts- Sedimentary rock plain, small hilly - Sandstone, silt, mudstone, marl, 3 - 8%	182,34	1,31
3	Typic Dystrudepts- Sedimentary rock plain, small hilly - Sandstone, silt, mudstone, marl, 8 - 15%	25,83	0,19
4	Typic Dystrudepts- Sedimentary rock plains, wavy to wavy-silt, mudstone, sandstone, new (fresh) river deposits, 0 - 3%	1.826,92	13,14
5	Typic Dystrudepts- Sedimentary rock plains, wavy to wavy-silt, mudstone, sandstone, new (fresh) river deposits, 3 - 8%	4.128,00	29,70
6	Typic Dystrudepts- Sedimentary rock, wavy to wavy-silt, mud rock, sandstone, new (fresh) river deposits, 8 - 15%	23,54	0,17
7	Typic Dystrudepts- Irregular sedimentary mountains -	56,78	0,41

SPT Number	Description of Land Map Unit	Area	
		Ha	%
	Sandstone, conglomerates, silt, 15 - 25%		
8	Typic Dystrudepts- Irregular sedimentary rocks - Sandstone, conglomerates, silt, 8 - 15%	68,40	0,49
9	Typic Endoaquepts- Swampy floodplains from narrow (fresh) river valleys; 0 - 3%	25,73	0,19
10	Typic Endoaquepts- Swampy floodplains from narrow (fresh) river valleys, 3 - 8%	56,41	0.41
11	Typic Endoaquepts- Swampy floodplains from narrow (fresh) narrow river valleys, 8 - 15%	34,31	0,25
12	Typic Endoaquepts- Sedimentary rock, wavy to wavy-silt, mud rock, sandstone, new (fresh) river deposits, 0 - 3%	179,00	1,29
13	Typic Endoaquepts- Sedimentary rock, wavy to wavy-silt, mud rock, sandstone, new (fresh) river deposits, 3 - 8%	123,12	0,89
14	Typic Endoaquepts- Sedimentary rock, wavy to wavy-silt, mud rock, sandstone, new (fresh) river deposits, 8 - 15%	20,14	0,14
15	Typic Endoaquults- Sedimentary rock, wavy to wavy-silt, mud rock, sandstone, new (fresh) river deposits, 0 - 3%	35,89	0,26
16	Typic Epiaquents- Sedimentary rock, wavy to wavy-silt, mud rock, sandstone, new (fresh) river deposits 8 - 15%	15,96	0,11
17	Typic Epiaquents- Irregular sedimentary rocks - Sandstone, conglomerates, silt >40%	445,78	3,21
18	Typic Epiaquents- Irregular sedimentary rocks - Sandstone, conglomerates, silt 25 - 40%	82,75	0,60
18=19	Typic Epiaquents- Irregular sedimentary rocks - Sandstone, conglomerates, silt 8 - 15%	441,97	3,18
20	Typic Epiaquepts- Sedimentary rock, wavy to wavy-silt, mud rock, sandstone, new (fresh) river deposits 8 - 15%	67,31	0,48
21	Typic Fluvaquent- Swampy floodplains from narrow (fresh) narrow river valleys 0 - 3%	58,15	0,42
22	Typic Fluvaquent- Swampy floodplains from narrow (fresh) narrow river valleys 0 - 3%	11,91	0,09
22	Typic Fluvaquent- Swampy floodplains from narrow (fresh) narrow river valleys 3 - 8%	10,03	0,07
24	Typic Haplofibrist- Sedimentary rock, wavy to wavy-silt, mud rock, sandstone, new (fresh) river deposits 3 - 8%	18,90	0,14
25	Typic Haplosaprist- Swampy floodplains from narrow (fresh) river valleys; peat 8 - 15%	25,48	0,18
26	Typic Hapludults- Swampy floodplains from narrow (fresh) narrow river valleys 0 - 3%	29,21	0,21
27	Typic Hapludults- Swampy floodplains from narrow (fresh) narrow river valleys 3 - 8%	29,97	0,22
28	Typic Hapludults- Swampy floodplains from narrow (fresh) narrow river valleys 8 - 15%	90,02	0,65
29	Typic Hapludults- Sedimentary rock, small hilly - Sandstone, silt, mud stone, marl 0 - 3%	44,37	0,32
30	Typic Hapludults- Sedimentary rock, small hilly - Sandstone,	10,53	0,08

SPT Number	Description of Land Map Unit	Area	
		Ha	%
	silt, mud stone, marl 15 - 25%		
31	Typic Hapludults- Sedimentary rock, small hilly - Sandstone, silt, mud stone, marl 3 - 8%	665,79	4,79
32	Typic Hapludults- Sedimentary rock, small hilly - Sandstone, silt, mud stone, marl 8 - 15%	484,50	3,49
33	Typic Hapludults- Sedimentary rock, wavy to wavy-silt, mud rock, sandstone, new (fresh) river deposits 0 - 3%	467,12	3,36
34	Typic Hapludults- Sedimentary rock, wavy to wavy-silt, mud rock, sandstone, new (fresh) river deposits 3 - 8%	3.396,42	24,43
35	Typic Hapludults- Sedimentary rock, wavy to wavy-silt, mud rock, sandstone, new (fresh) river deposits8 - 15%	264,05	1,90
36	Typic Plinthudults- Sedimentary rock, wavy to wavy-silt, mud rock, sandstone, new (fresh) river deposits 3 - 8%	95,11	0,68
37	Typic Ustipsamment- Sedimentary rock, wavy to wavy-silt, mud rock, sandstone, new (fresh) river deposits 3 - 8%	31,63	0,23
38	Typic Ustipsamment- Sedimentary rock, wavy to wavy-silt, mud rock, sandstone, new (fresh) river deposits 0 - 3%	13,11	0,09
39	Typic Ustipsamment- Sedimentary rock, wavy to wavy-silt, mud rock, sandstone, new (fresh) river deposits 3 - 8%	181,65	1,31
40	Typic Ustipsamment- Sedimentary rock, wavy to wavy-silt, mud rock, sandstone, new (fresh) river deposits 8 - 15%	102,70	0,74
TOTAL		**13.900**	**100**

Discussing about peat, based on land systems (based on RePPProT, 1988) is a Beliti land system with an area of 375.75 ha (general condition). While the results of the semi-detailed survey study (November, 2016) found peatland area of 44.38 ha (actual condition).

Topography

The shape of the land surface of the study area is based on the results of the DEM SRTM analysis is a relatively flat-wavy area and slightly steep hills. The description of the 3 (three) dimensions of land surface is presented in Figure 3. The area of the most flat-wavy area dominates about 83.80% of the total area. The study area is at an altitude of 36 - 324 meters above sea level. Based on the slope class, it is divided into 5 (five) types, namely flat, sloping, rather steep, steep and very steep (**Table 19, Figure 27 and Figure 28**).

Table 19. Topography and Land Slope in PT. PALJ

No.	Slope class	Description	Area (ha)	Prosentase (%)
1.	0 – 8 %	Flat	11.648,23	83,80
2.	8 – 15 %	Sloping	1.655,93	11,91
3.	15 – 25 %	A little steep	67,31	0,48
4.	25 – 40 %	Steep	82,75	0,60
5.	> 40 %	Very Steep	445,78	3,21
		Total	**13.900**	**100**

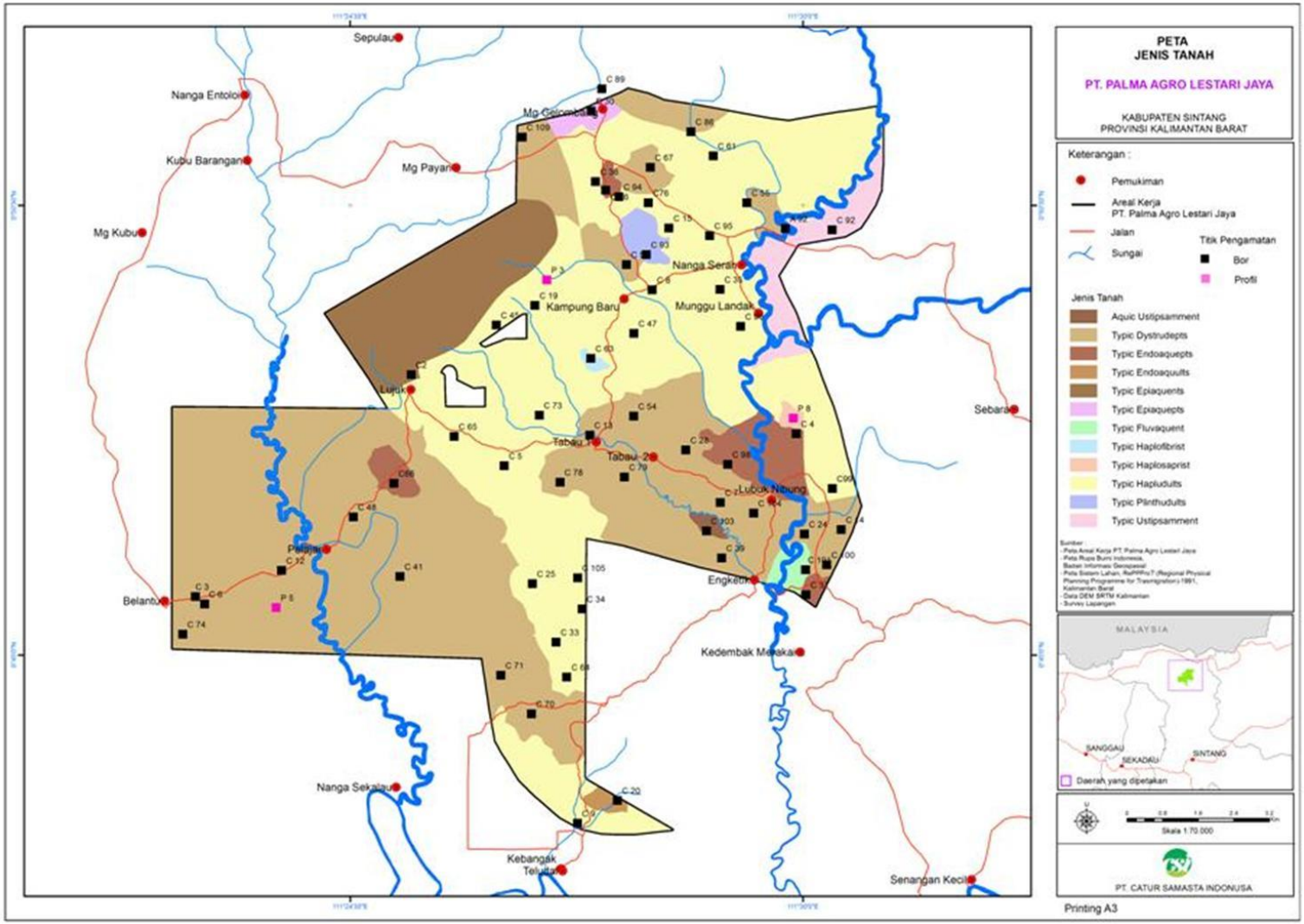


Figure 25. Type of soil map in the PT. PALJ

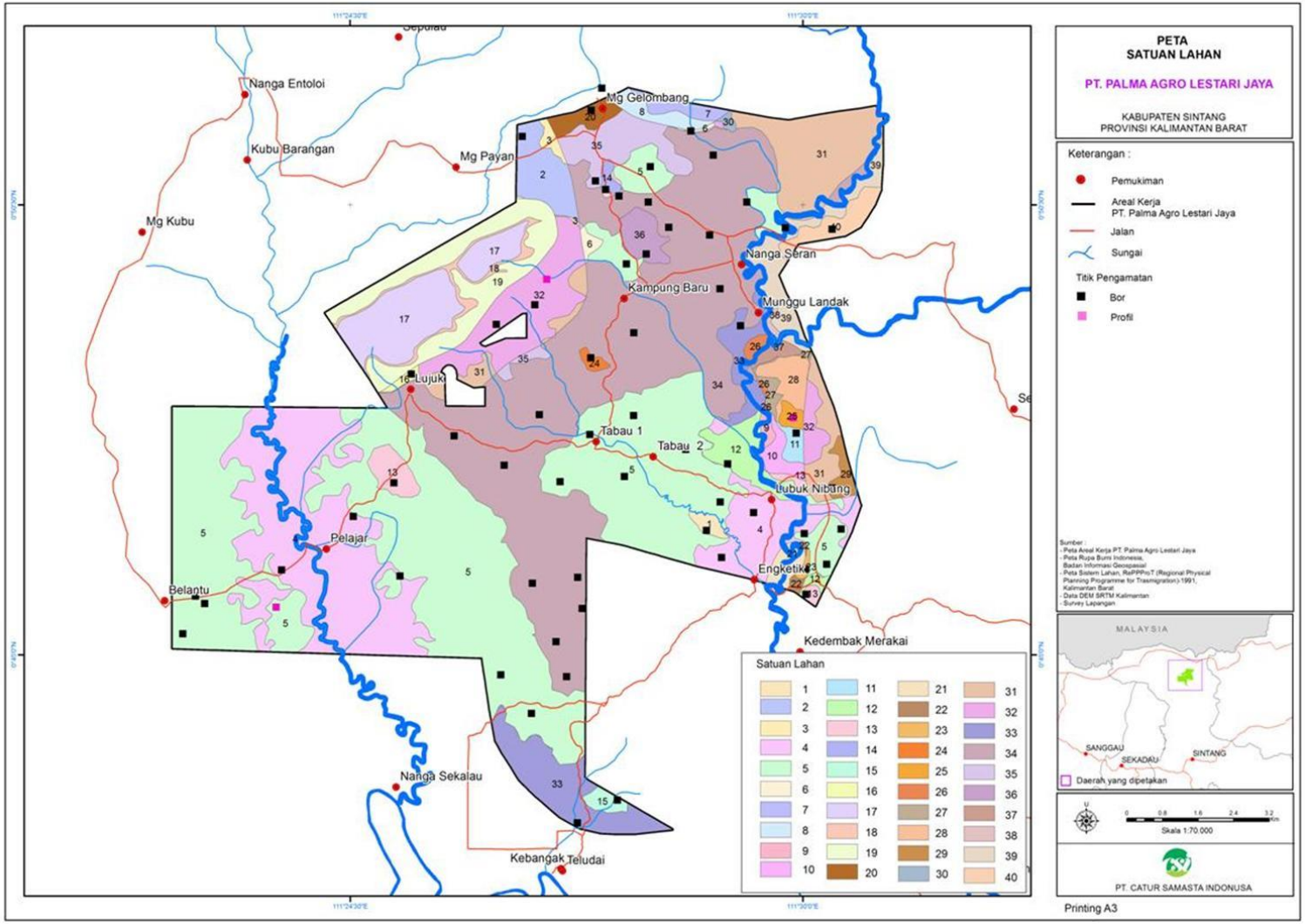


Figure 26. Land Map Units in the PT. PALJ

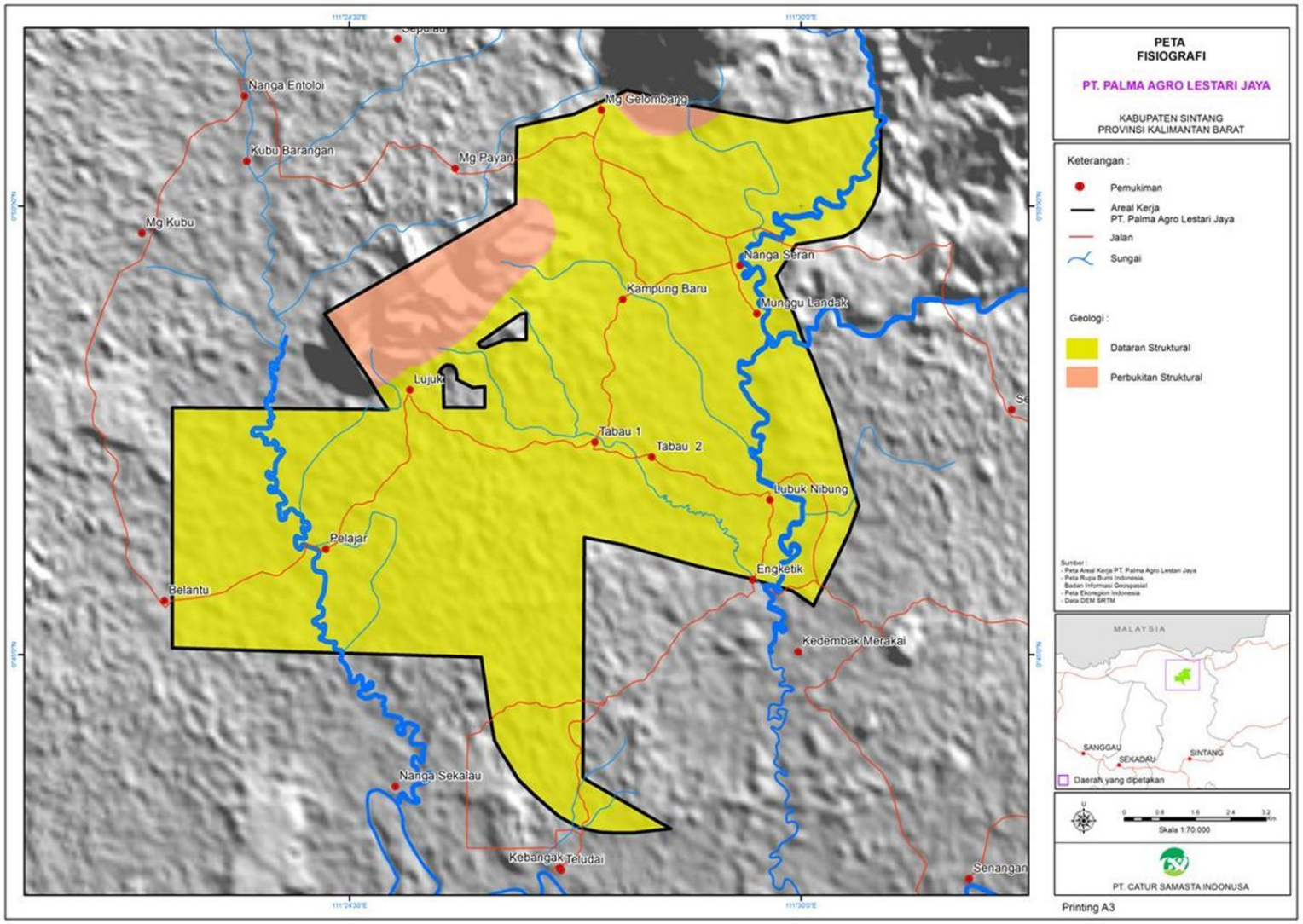


Figure 27. Land Physiography in the PT. PALJ

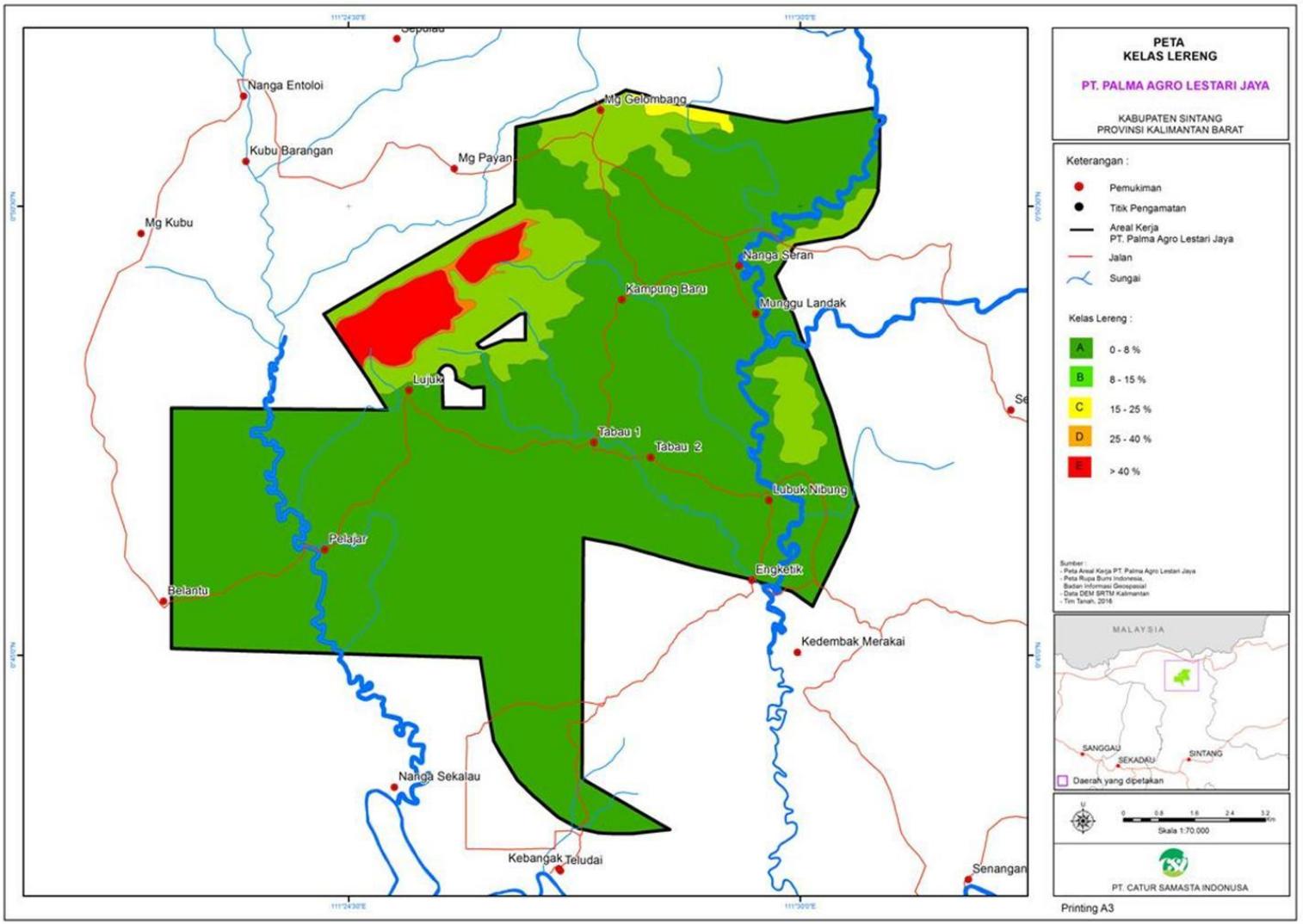


Figure 28. Slope class in the PT. PALJ

3.4. Summary of Carbon Stock Assessment and GHG emissions

Total carbon stock in the area of PT. PALJ is the total value of the amount of carbon stock in various classes of land cover (stratum) and the amount of carbon stock in peat soil in the area of PT. PALJ. Analysis of total carbon stock in various classes of land cover and carbon stock from all peat soils in the PT. PALJ, presented in Table 20 and Table 21.

Table 20. Carbon Stock in various land cover classes

Land Cover Class	Area (ha)	Carbon Stock (tC/ha)	Total Carbon Stock (tC)
Disturbed forest	277,92	139,55	38.783,74
Shrub land	572,61	7,63	4.369,01
Tree Crops	10.316,13	51,64	532.724,95
Food Crops	2.540,02	2	5.080,04
Settlement	270,21	0	0
Water body	99,58	0	0

Tabel 21. Peat soil carbon stock

Carbon Sources	Area (ha)	Carbon Stock (tC/ha)	Total Carbon Stock(tC)
Peat Soil	44,38	1.924,65	**85.415,97**

Remarks: Peatsoil is based on the results of a semi-detailed study of the soil, November 2016

Integration of Carbon Stock with HCV Findings

Based on the HCV area identification study, in the permit area of PT. PALJ has a total HCV area of 3,207.50 ha. Table 22 shows the integration of carbon stocks at various land coverings with HCV areas. HCV area in the permit area of PT. PALJ is integrated with a carbon stock area of 3,039.75 ha

Table 22. Summary Integration of Carbon Stock with HCV Findings.

Land cover & Carbon stock estimates	HCV Area (ha)
Disturbed Forest (139,55 ton C/ha)	215,28
Shrub land (7,63 ton C/ha)	324,03
Tree crops (51,64 ton C/ha)	1.120,20
Food crops (2 ton C/ha)	1.380,22
Total	**3.039,75**

The results of the semi-detailed mapping of the land and the suitability of the land in the permit area of PT. PALJ has a total area of peatland of 44.38 ha. Shows the integration of carbon stocks at various land coverings with peatlands. Peatlands in PT. PALJ is spread over disturbed forest land cover (17.63 ha), tree plantations (20.18 ha) and annual crops / food (6.58 ha).

Table 23. Summary Integration of Carbon Stock with Peatland.

Land cover & Carbon stock estimates	Peat land Area (ha)
Disturbed Forest (139,55 ton C/ha)	17,63
Tree crops (51,64 ton C/ha)	20,18
Food crops (2 ton C/ha)	6,58
Total	**44,38**

Map showing estimates of carbon stocks with HCV levels and peatlands in the oil palm plantation area of PT. Palma Agro Lestari Jaya is presented in Figure 29. Whereas maps showing areas to avoid and the potential for new planting in the oil palm plantation area of PT. Palma Agro Lestari Jaya is presented in Figure 30.

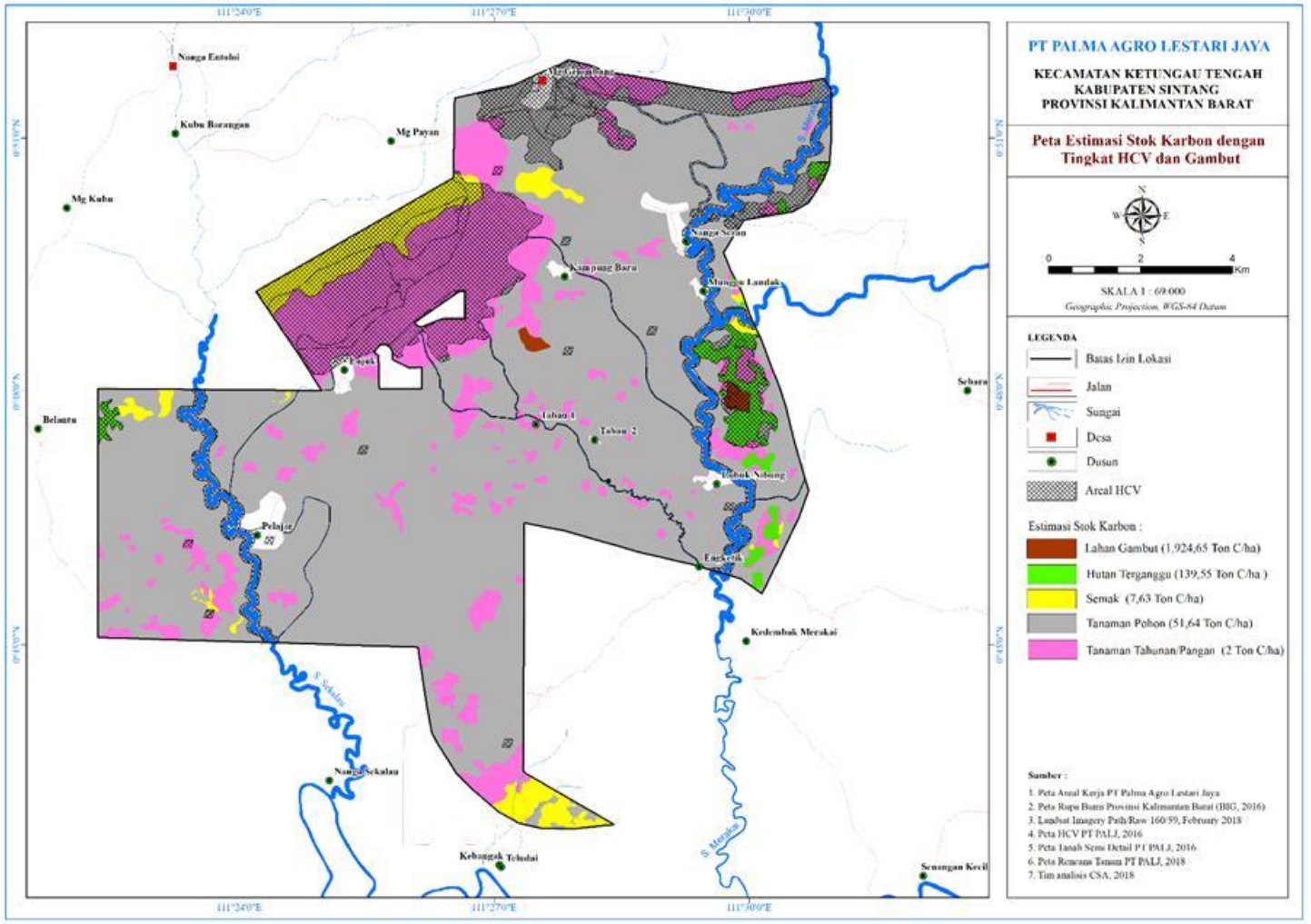


Figure 29. Map of Carbon Stock Estimates at various land cover with HCV and Peatland levels in the area of PT. PALJ

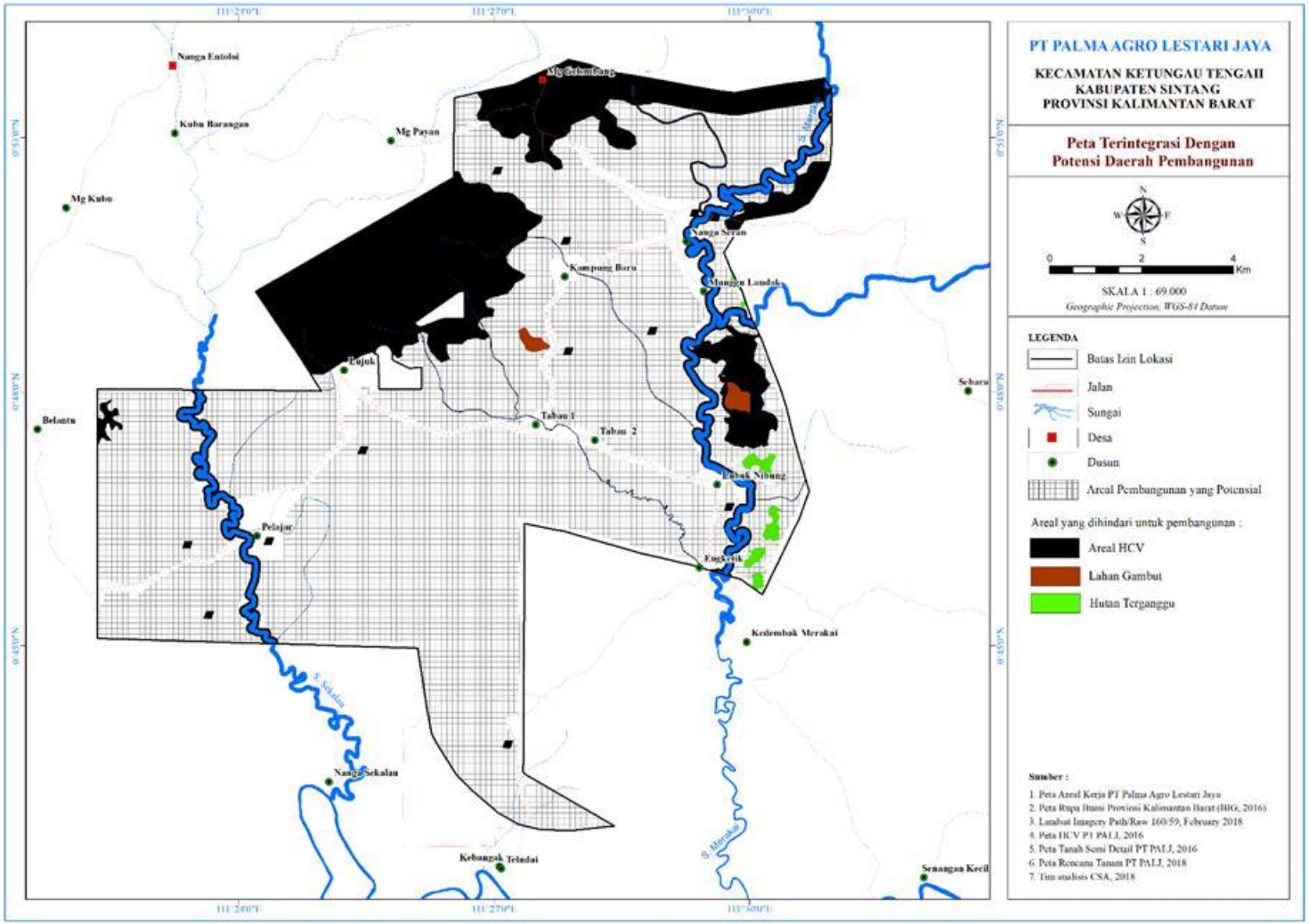


Figure 30. Map of areas to be avoided and the potential for new planting in the area of PT. Palma Agro Lestari Jaya

New Development Scenario

Table 24. Scenario for new development in the PT PALJ

Scenario	Explanation
Scenario 1 (S1)	▪ All potential land cover for new planting is opened for oil palm. ▪ All Peat and Disturbed Forests will be conserved ▪ There are no methane capture facilities planned for the plant ▪ There is no land clearing in the identified HCV area ▪ Planned plant area = 9,576.96 ha ▪ Plan for conservation area = 3,291,83 ha
Scenario 2 (S2)	▪ All potential land cover for new planting is opened for oil palm ▪ All Peat and Disturbed Forests will be conserved ▪ There are methane capture facilities planned for the plant ▪ There is no land clearing in the identified HCV area ▪ Planned plant area = 9,576.96 ha ▪ Plan for conservation area = 3,291,83 ha♣

		S1	S2
Regions avoided for new development	HCV	3.182,02 ha	3.182,02 ha
	HCV (Peat)	25,48 ha	25,48 ha
	Disturbed forest	65,43 ha	65,43 ha
	Peat Land	18,90 ha	18,90 ha
Areas that have the potential for new planting	Scrhub	231,15 ha	231,15 ha
	Tree plant	8.301,74 ha	8.301,74 ha
	Annual plant / food	1.044,07 ha	1.044,07 ha
POME treatment	Convensional treatment	Yes	No
	Methane trap	Not	Exist

4.3. GHG Emission Projection

The GHG emission projection in the area of PT. Palma Agro Lestari Jaya is calculated using the RSPO New Development GHG Calculator to determine the emissions projections associated with the choice of scenarios developed. Description below a shows the results of the calculation of GHG emissions projections in the area of PT. PALJ.

Scenario 1

Emmision & Carbon absorb (assumsion maximum oil palm growth - for use by large scale operations)

Field emissions & sinks (Assumes vigorous growth for oil palm - for use by large scale operations)			
	t CO_2e	t CO_2e/ha	t CO_2e/t FFB
Land clearing	63,441.20	6.62	0.33
Crop sequestration	-89,656.95	-9.36	-0.47
Fertilisers	5,485.82	0.57	0.03
N2O	6,384.40	0.67	0.03
Field fuel	738.15	0.08	0.00
Peat	0.00	0.00	0.00
Conservation credit	-9,234.10	-0.96	-0.05
Total	-22,841.47	-2.39	-0.12
Mill emissions & credit	tCO_2e	t CO_2e/ha	tCO_2e/tFFB
POME	37,544.93	3.92	0.20
Mill fuel	7,020.83	0.73	0.04
Purchased electricity	0.00	0.00	0.00
Credit (excess electricity exported)	0.00	0.00	0.00
Credit (sale of biomass for power)	0.00	0.00	0.00
Total	44,565.76	4.65	0.23
Total emissions, tCO_2e (field and mill)	21,724		
Allocation:			
t CO_2e/t CPO	0.43		
t CO_2e/t PK	0.43		

Scenario 2

Emission & Carbon absorb (assumsion maximum oil palm growth - for use by large scale operations)

Field emissions & sinks (Assumes vigorous growth for oil palm - for use by large scale operations)			
	t CO_2e	t CO_2e/ha	t CO_2e/t FFB
Land clearing	63,441.20	6.62	0.33
Crop sequestration	-89,656.95	-9.36	-0.47
Fertilisers	5,485.82	0.57	0.03
N2O	6,384.40	0.67	0.03
Field fuel	738.15	0.08	0.00
Peat	0.00	0.00	0.00
Conservation credit	-9,234.10	-0.96	-0.05
Total	-22,841.47	-2.39	-0.12
Mill emissions & credit	tCO_2e	t CO_2e/ha	tCO_2e/tFFB
POME	5,493.58	0.57	0.03
Mill fuel	7,020.83	0.73	0.04
Purchased electricity	0.00	0.00	0.00
Credit (excess electricity exported)	0.00	0.00	0.00
Credit (sale of biomass for power)	0.00	0.00	0.00
Total	12,514.41	1.31	0.07
Total emissions, tCO_2e (field and mill)	-10,327		
Allocation:			
t CO_2e/t CPO	-0.20		
t CO_2e/t PK	-0.20		

Based on the consideration up to now PT PALJ has no plans to build Methane Capture and then for the new planting plan, the land cover that is opened is only prioritized on bush cover, tree crops and annual crops / food. Then scenario 1 is the optimal development choice in the area of PT. Palma Agro Lestari Jaya. In this scenario, GHG emissions from land clearing and operational activities will be absorbed by Conservation Areas (HCV Areas), Disturbed Forests, Peatlands and oil palm plants. Summary of GHG emissions for new development plans in the PT. Palma Agro Lestari Jaya is presented in Figure 31. While the New Development Plan Map in the area of PT. Palma Agro Lestari Jaya is presented in Figure 32.

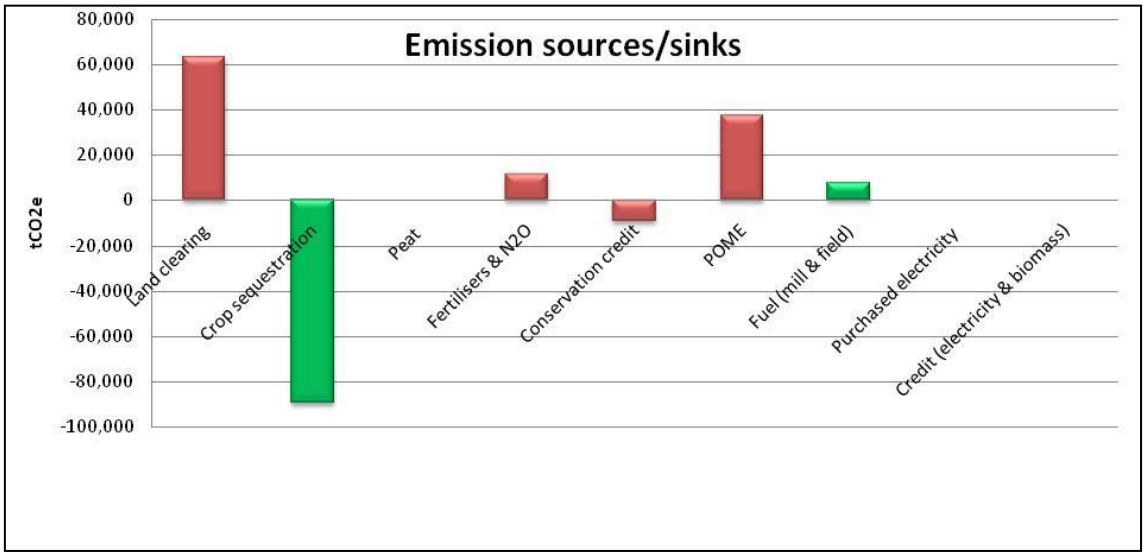


Figure 31. Summary of GHG emissions (tCO_2e) for new development plans in the PT. Palma Agro Lestari Jaya

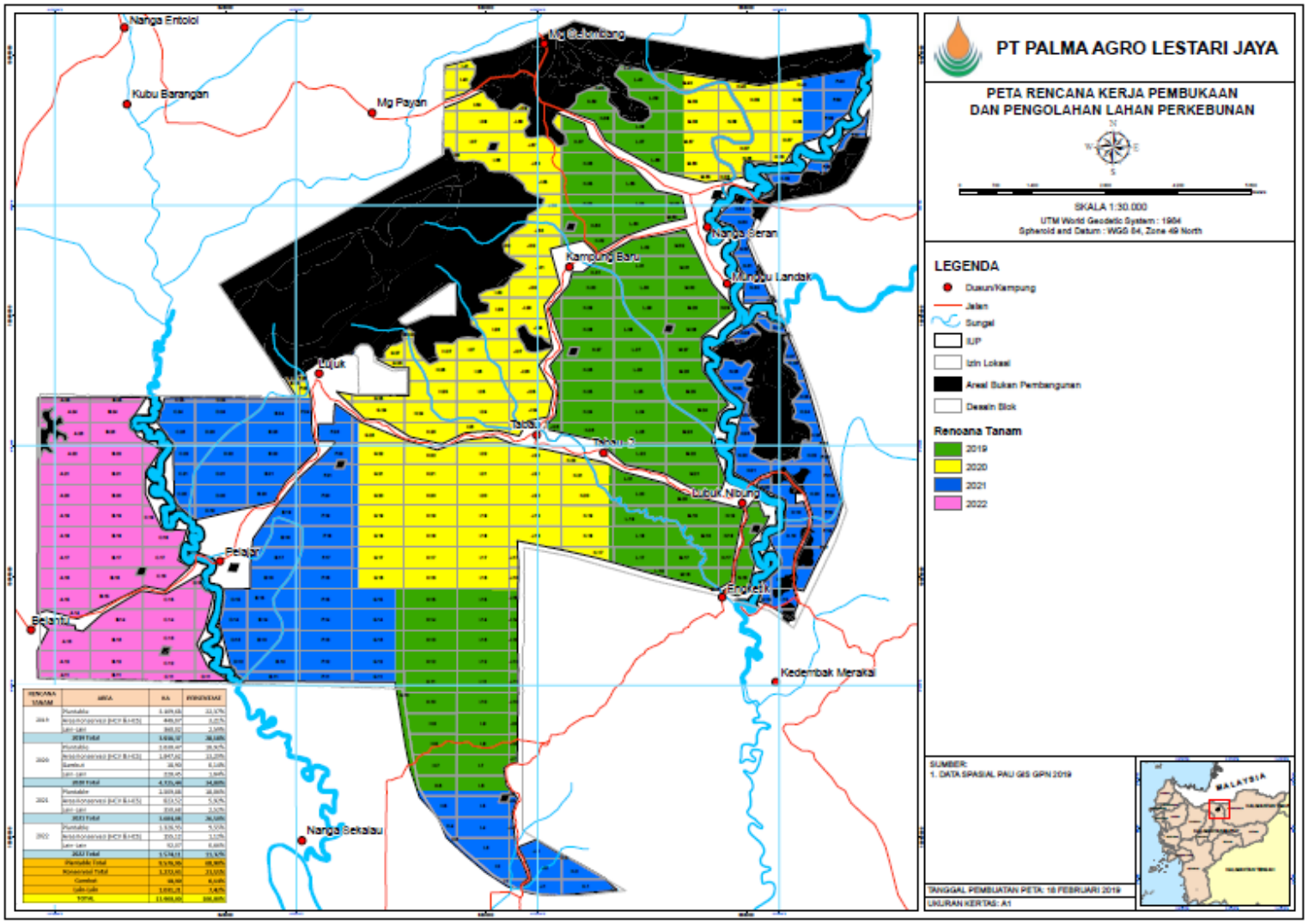


Figure 32. New Development Plan Map in the area of PT. PALJ

3.5. LUC analysis

Historical Analysis of Land Use Change

Table 25. Historical Analysis of Land Use Change in the PT PALJ

No.	Code	Land cover	Large (ha)					
			Before November 1, 2005	November 1, 2005 - November 31, 2007	December 1, 2007 - December 31, 2009	January 1, 2010 – May 9, 2014	May 9, 2014 – HCV identified	Ground truthing, 2018
1	DIF	*Disturbed Forest*	399,33	397,36	337,14	259,27	254,14	254,14
2	DSF	*Disturbed Swamp Forest*	58,00	58,00	23,78	23,78	23,78	23,78
3	MTC	*Mixed Tree Crops*	9.731,87	9.284,33	9.421,04	9.421,04	9.283,14	9.283,14
4	SCH	*Shrubs*	675,50	619,07	584,09	580,58	572,61	572,61
5	RPL	*Rubber Plantation*	1.243,82	1.243,82	1.222,09	1.222,09	1.184,64	1.032,99
6	DCL	*Dry Cultivation Land*	1.598,16	2.104,10	2.118,55	1.963,33	2.388,37	2.540,02
7	SET	*Settlements*	270,21	270,21	270,21	270,21	270,21	270,21
8	WAB	*Water Bodies*	99,58	99,58	99,58	99,58	99,58	99,58
Total (ha)			**14.076,48**	**14.076,48**	**14.076,48**	**14.076,48**	**14.076,48**	**14.076,48**

Environmental Remidiation

Because land clearing activities for oil palm development and infrastructure until this study were compiled in 2018 have not been carried out, there is no distribution of areas lost due to oil palm development and prohibited by the RSPO P & C in the PT. PALJ. So there is no potential remediation until the end of the liability period.

LUCA result before multiplying with vegetation coefficient

Land clearing activities for oil palm development and infrastructure in the PT. PALJ until this study was compiled in 2018 has not been done both Corporate and Non-Corporate, so the results of LUCA calculations in the PT. PALJ has a value of 0.

Table 26. The results of LUCA calculations in the PT Palma Agro Lestari Jaya area before multiplying by the vegetation coefficient

Land cover class	Vegetation Coefficient	Nov 1, 2005 to Nov 30, 2007	Dec 1, 2007 to Dec 31, 2009	Jan 1, 2010 to May 9, 2014	After May 9, 2014
One or more land cover classes which fulfill the criterion of vegetation coefficient 1.0	1.0	-	-	-	-
One or more land cover classes which fulfill the criterion of vegetation coefficient 0.7	0.7	-	-	-	-
One or more land cover classes which fulfill the criterion of vegetation coefficient 0.4	0.4	-	-	-	-
One or more land cover classes which fulfill the criterion of vegetation coefficient 0.0	0	-	-	-	-
Total (sum of rows)		**-**	**-**	**-**	**-**

Final compesation liability

Prediction of compensation amount is calculated using the area of land clearing that occurs in each period of liability multiplied by the vegetation coefficient of land cover in 2005 (Baseline).

Table 27. The results of LUCA calculations in the PT Palma Agro Lestari Jaya area after multiplied by the vegetation coefficient

Period of land clearance	Land controlled by a non-member at time of clearance	Land controlled by a RSPO member at time of clearance. This Includes land acquired from other RSPO members
After May 9, 2014	0	-
January 1, 2010 – May 9, 2014	0	-
December 1, 2007 - December 31, 2009	0	-
November 1, 2005 - November 31, 2007	0	-
Total (ha)	0	-

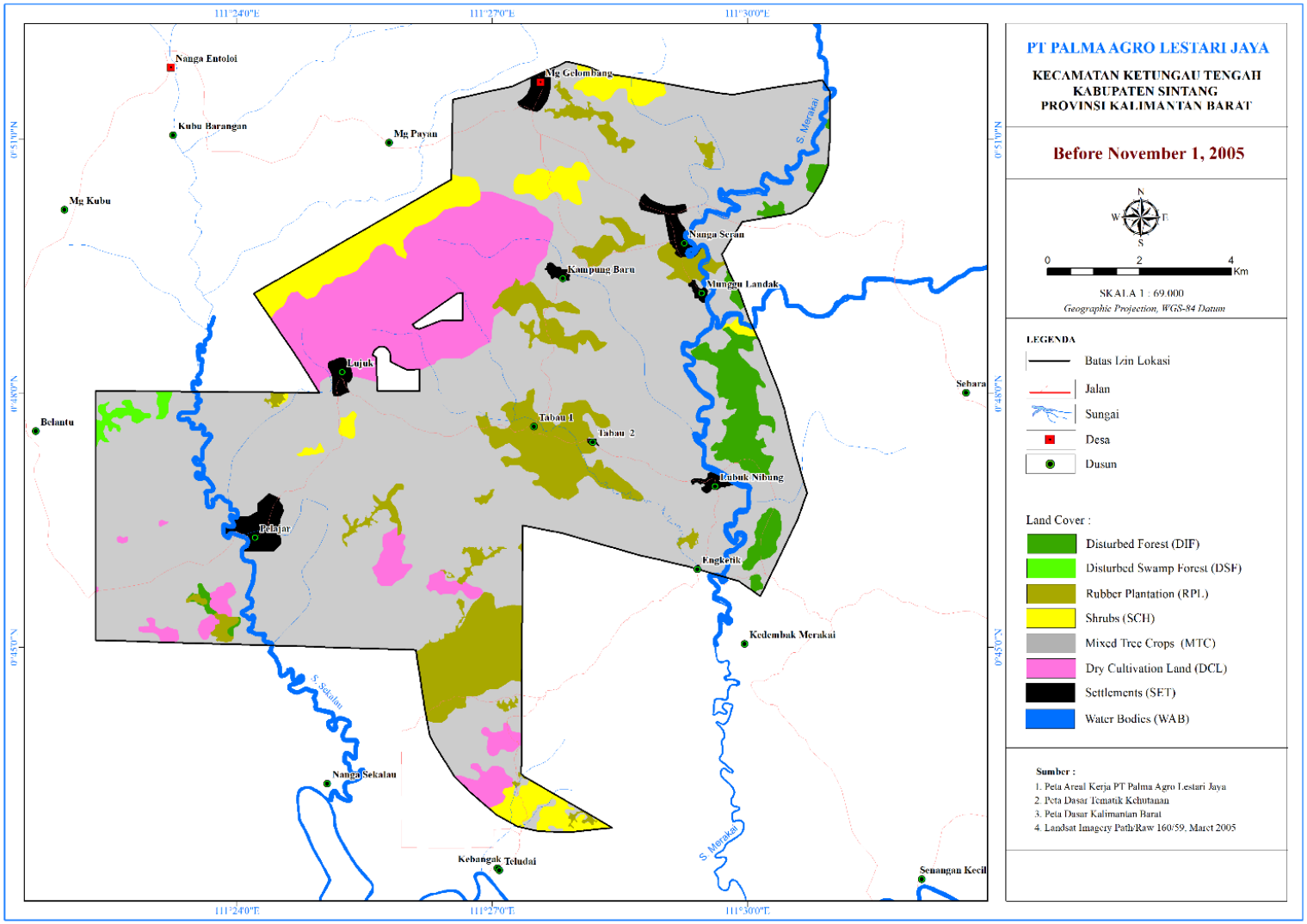


Figure 33. Land cover map - *Before November 1, 2005*

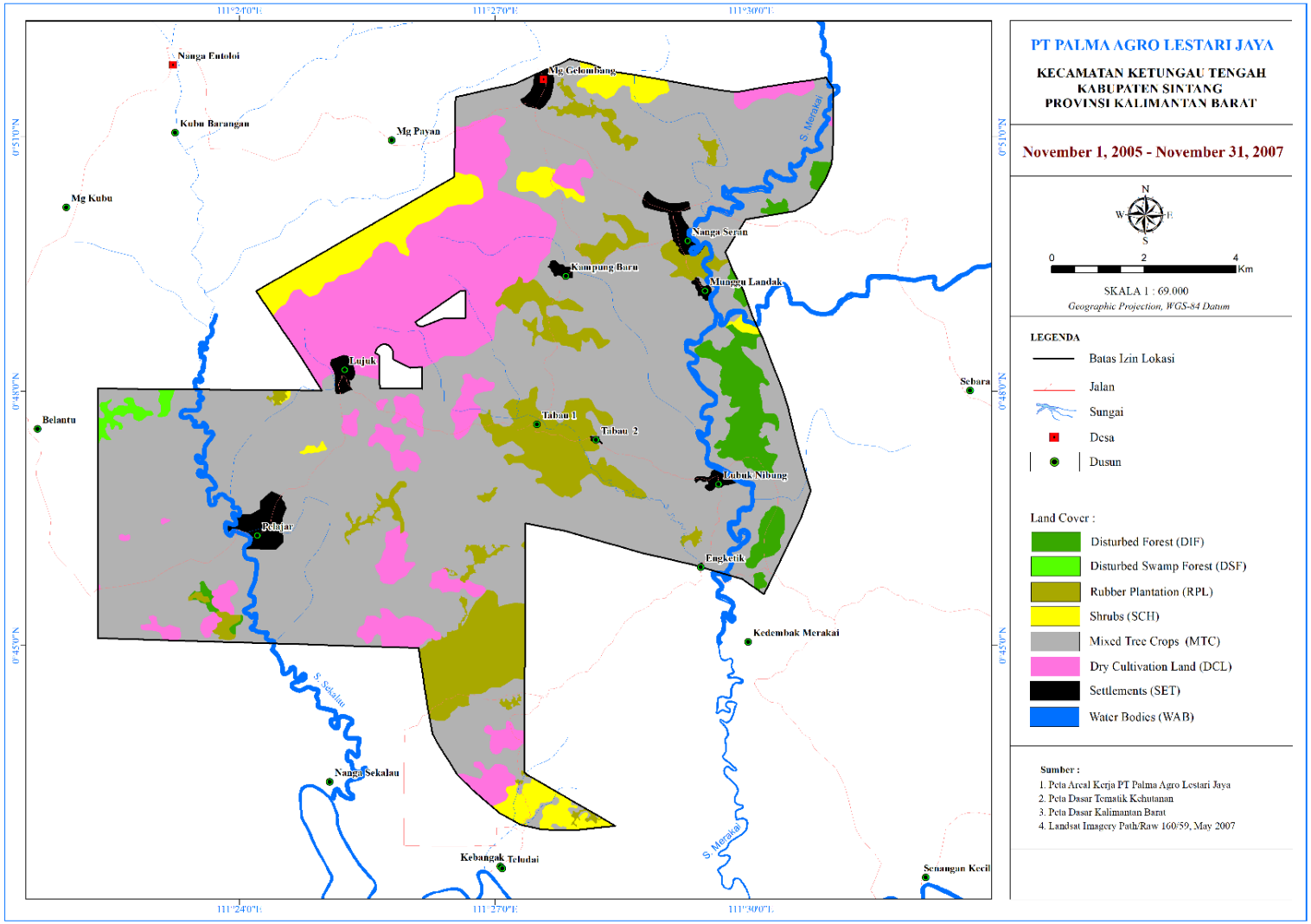


Figure 34. Land cover map - *November 1, 2005 - November 31, 2007*

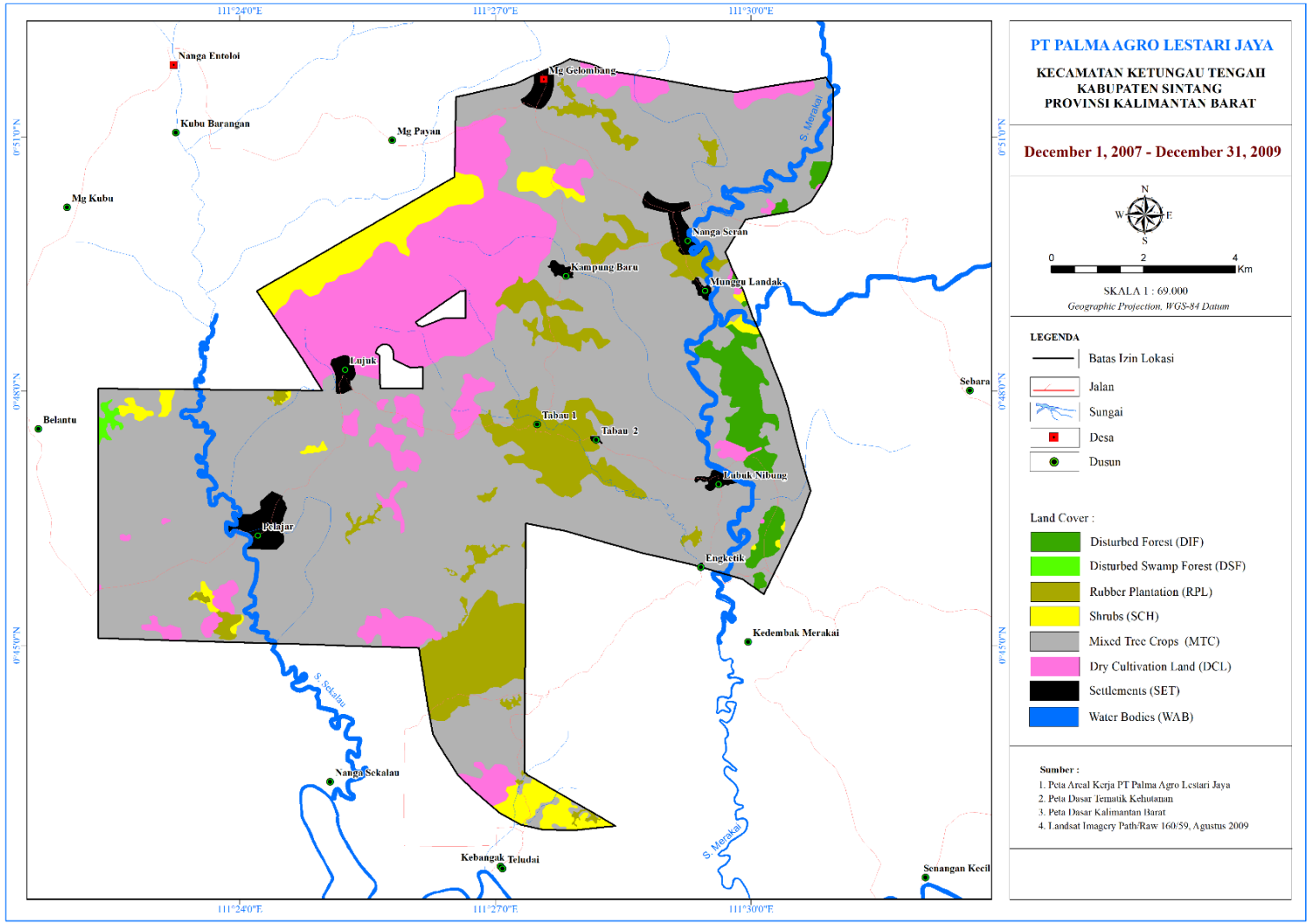


Figure 35. Land cover map - *December 1, 2007 - December 31, 2009*

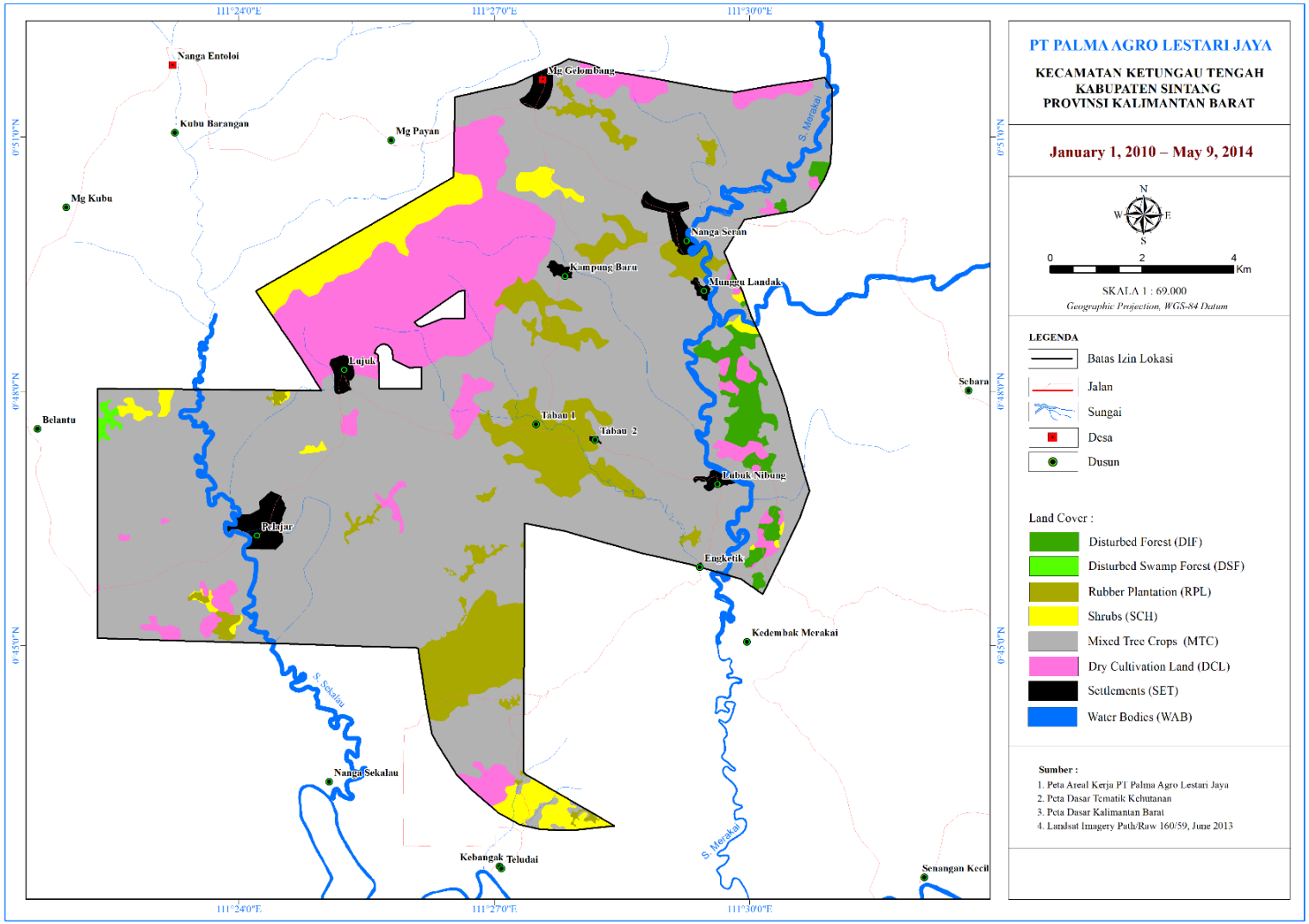


Figure 36. Land cover map - *January 1, 2010 – May 9, 2014*

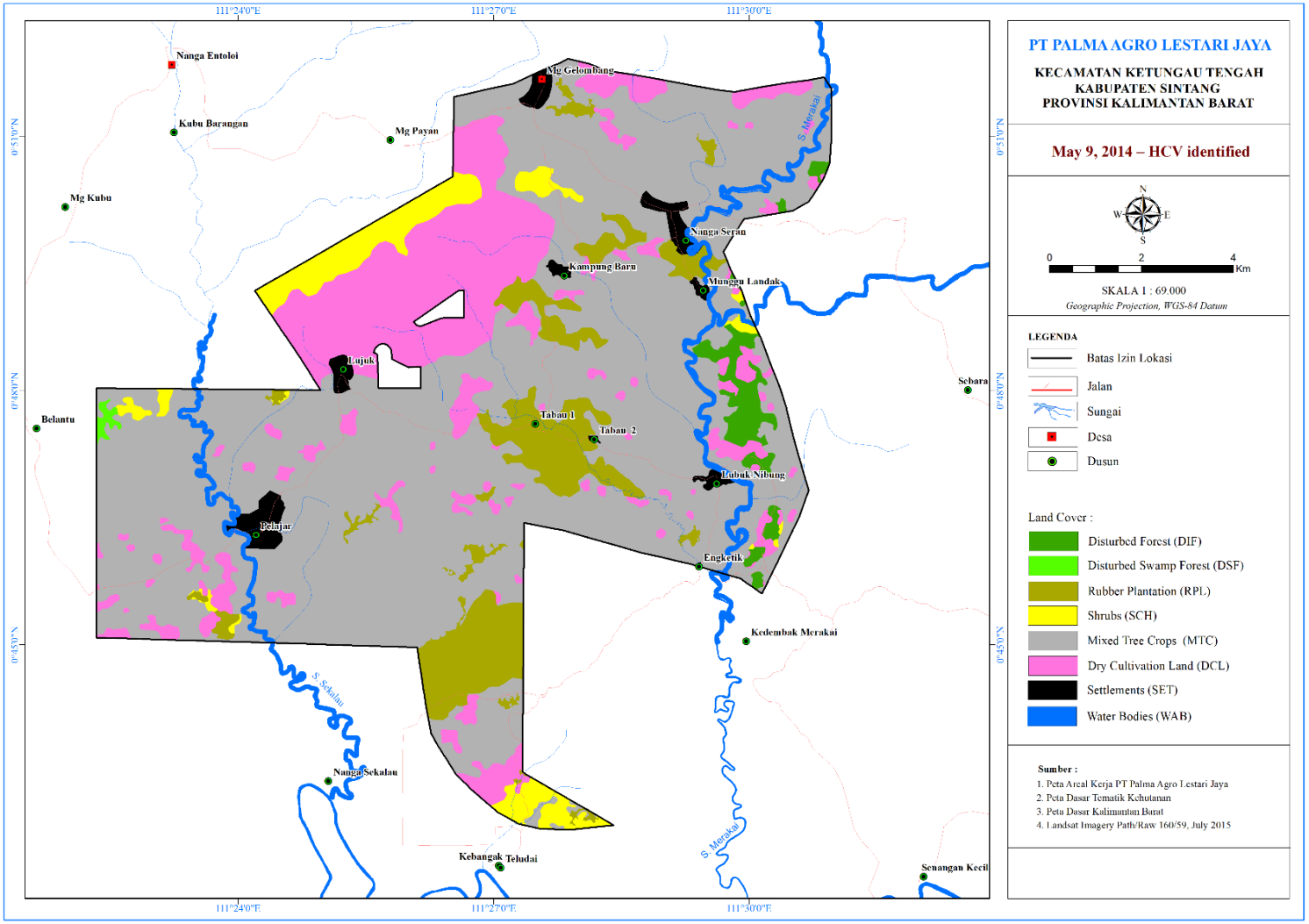


Figure 37. Land cover map - *May 9, 2014 – HCV identified*

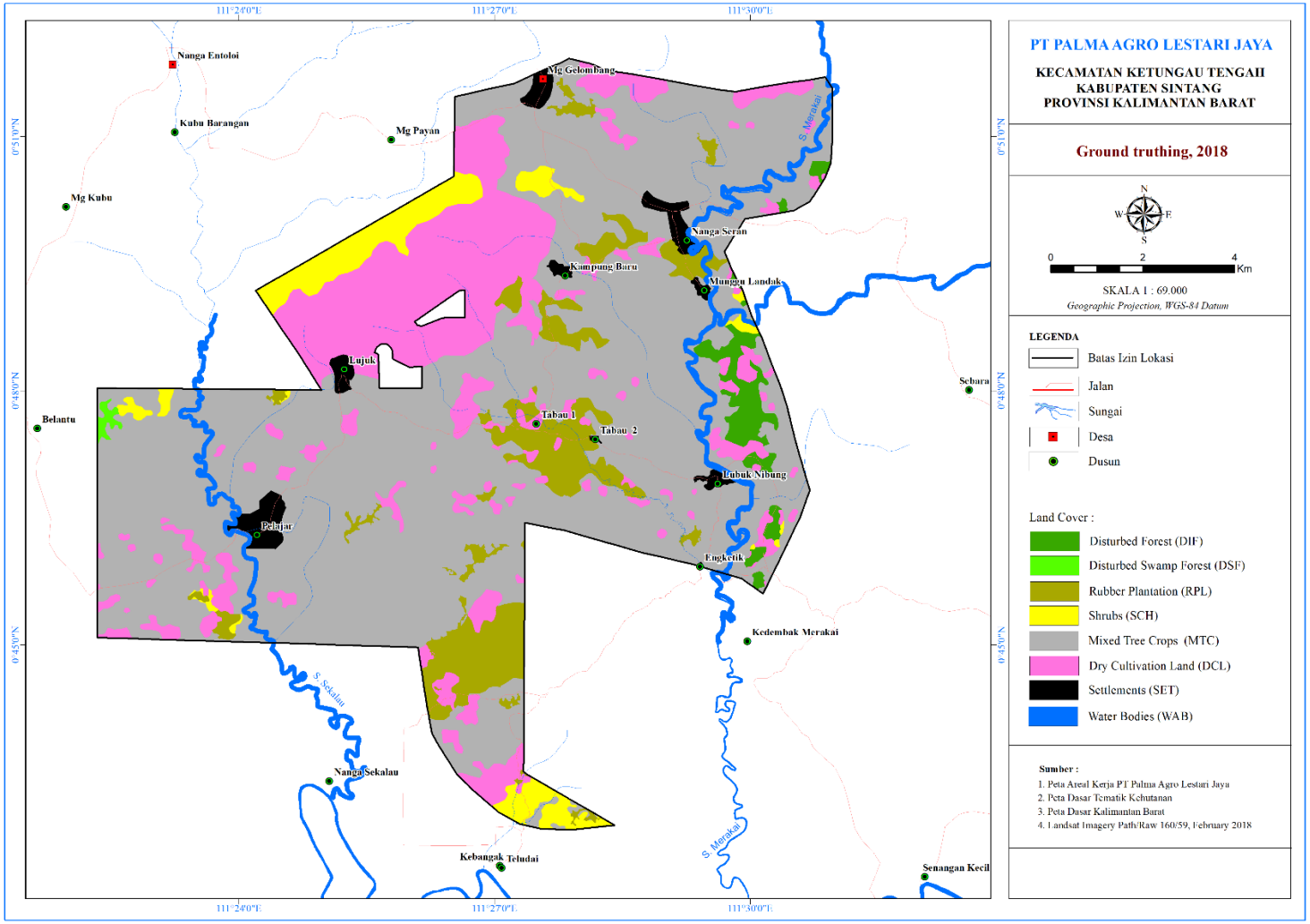


Figure 38. Land cover map - *Ground truthing, 2018*

3.6. FPIC process

Land ownership

Land ownership by the community around PT. The area of PALJ is different. These lands are recognized by custom even though they are not certified. The difference in land area is the result of differences in the work of each community in clearing land, so that people who are able to open land are more extensive, then they will have more land / land that is also wider. The way to obtain land area for residents around PT. PALJ is presented in Table 28.

Table 28. How to Obtain Land Area Performed by Residents Around PT. PALJ

No	Village	Land ownership in the concesion
1.	Wirayuda	- Land is controlled by only a few people. - Land acquisition is obtained by farming
2.	Swadaya	- The majority of people's land tenure is from former ancestral claims. - 80% of the people's private land. - Land conflict between Swadaya Village and Wana Bhakti Village within the concession. The area that is in conflict is in Block O95
3.	Margahayu	- Land acquisition is obtained from farming and inheritance from parents.
4.	Wana Bhakti	- Land ownership by residents is obtained from the expansion of fields and inheritance from parents from generation to generation
5.	Senangan Kecil	- Land acquired from former fields and making huts
6.	Mungguk Gelombang	- Land ownership within the concession area by the Landlord. - Land tenure is based on their former fields. - In addition, land tenure is also based on the acquisition of ancestors from generation to generation

Land use

Land use within the PT PALJ concession has almost the same. Land in the concession area is used by residents for agriculture, plantations and cultivation. Several types of plants planted by the community in the concession area, including: rice, corn, cassava, rubber, rice / pepper and others. When the survey was carried out, rice, rubber, sahang / pepper were the dominant types of plants cultivated by the community. The use of land in other concessions is for tombs, both the tombs of previous ancestors and the tombs that are still active. The tombs are protected by custom and have also been agreed by the company to be diverted so that they will not be opened for oil palm plantations.

Other land uses are tembawai or tembawang, which are forest-like lands, containing fruit trees that can be utilized by the community (Table 29)

.

Table 29. Land Utilization by Residents PT PALJ

No	Village	Landuse in the concession area
1.	Wirayuda	- The land is dominated by rubber and tembawang (nyatu trees, tengkawang and fruit trees such as cempedak, rambutan, durian, etc.)
2.	Swadaya	- Planted rice, sahang, and rubber.
3.	Margahayu	- Residents' land is dominated by rubber, and few for sahang and tembawang plants
4.	Wana Bhakti	- The land is used for rubber and copper (= tembawang) - About 40% of rubber, rice, and tengkawang plants, but - residents do not know the exact land area. - In the O95 block which is a conflict, there are many types of tree, rengas, tengkawang, wood tekam, meranti, bamboo, etc..
5.	Senangan Kecil	- Land in the PT PALJ concession is planted with sahang / pepper, rubber, and tembawang (village customary forest)
6.	Mungguk Gelombang	- Utilization of land in the concession with other rubber and Tembawang plants, such as rambutan, durian, langsat, etc. as well as a little for sahang / pepper plants

FPIC Analysis

1) FPIC Phase 1 – Stakeholder identification

Regarding the plan to open a plantation by PT PALJ, several parties have been identified, including muspika, residents as village government officials, community leaders, religious leaders, and so on. Mapped land users refer to the 2015 RSPO FPIC Toolkit, namely landlords, farmers, migrant workers, seasonal users, communal land, private land, etc. The information is adjusted to the prevailing habits in the villages around PALJ, so that it can be different in each region. In order to start the opening of oil palm plantations, the company first conducts socialization, including in relation to land compensation or commonly referred to as Land compensation (GRL). According to residents, the release / release of land by the company began in 2013. Land acquisition through GRL by the company is still experiencing various obstacles, so the target for the opening of oil palm plantations is delayed. Meanwhile, the public wants the land that has been freed to be realized immediately opened.

2) FPIC Phase 2 – Formation of Work Group

In accordance with the conditions imposed by the RSPO on the 2015 FPIC Toolkit the formation of working groups must involve representatives of each layer of society, and the community determines for themselves the representative. From the FGD results and interviews with several community leaders who were proposed to be able to join work teams or work groups. This working group is called the Village Team.

3) FPIC Phase 3 - Participatory Mapping

The implementation of participatory mapping was carried out by showing a sketch of the concession map planned for opening partner gardens. The next stage is discussion participants (Village Head, BPD Chairperson, LPM Chairperson, community leaders,

and traditional leaders) are asked to indicate the location or area within the concession area that is still used by residents to grow crops as a source of livelihood, concession boundaries PT PALJ, village administrative boundaries, fulfillment of basic needs and other land uses. The results of the study with the participatory mapping method will obtain information on the area indicated that it needs mitigation as well as areas that are the focus of FPIC activities. Map sketches made with participatory mapping are then verified. Verification method by overlaying sketches of maps with real conditions in the field using the application of geographic information systems (GIS) for the benefit of the results of FPIC analysis regarding the concession area. The process of participatory mapping can be seen in **Figure 27**.

Desa Swadaya

Desa Wana Bhakti

Desa Mungguk Gelombang

Desa Marga Hayu

Figure 39. The process of participatory mapping

From Figure 28 it can be seen (red circle) that in the area of the prospective concession there are already many people who use their land to fulfill their livelihood needs with oil palm, rubber, pepper, secondary crops, horticulture and other dry land agriculture and when FPIC is carried out in status has not been compensated or in GRL by the company. And based on the discussion it was found that each citizen was able to open land for agriculture / plantations within the concession area ranging from ± 2-4 hectares. Thus to determine the land area and GRL of each citizen who acquired it, a follow-up of FPIC for this phase (participatory mapping) was needed by actively involving community leaders and villagers.

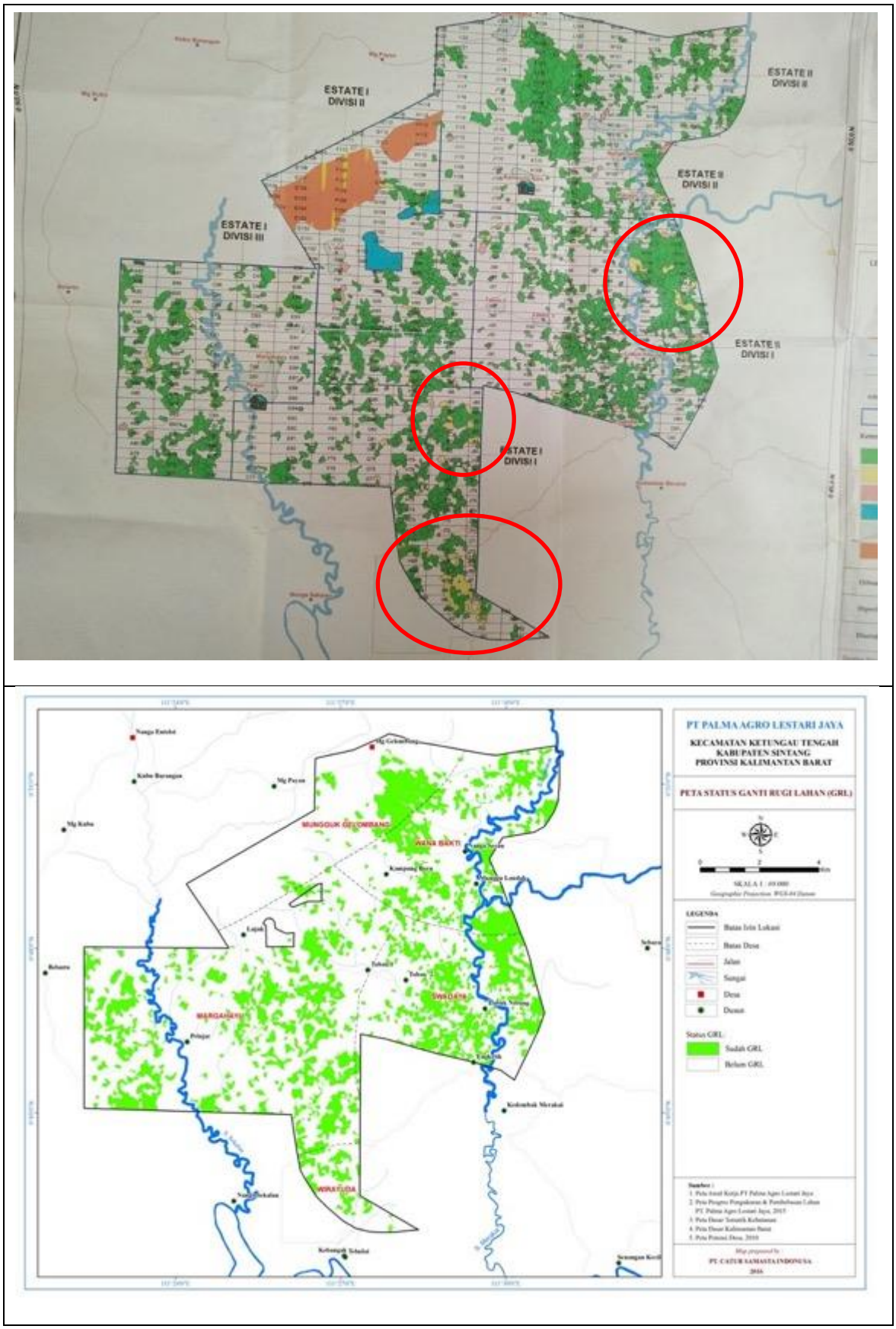


Figure 40. Sketch of Participatory Maps and GIS Mapping Results

4) FPIC Phase 4 - Information Giving Process from the Company

The process of providing information regarding the planned opening of oil palm plantations by PT PALJ has been carried out, but only limited to public awareness / consultation at the time of AMDAL, socialization of land acquisition, public consultation on HCV, CSA, SIA activities.

But the socialization has not yet all the people understood it, some people still question relate:

- ✓ Residents have long waited for clarity on the realization of the opening of the garden.
- ✓ When the FPIC was conducted the residents also asked about the clarity of the company's obligation to fulfill the plasma plantation (partnership plantation).
- ✓ Questioning the problem of employment opportunities at PT PALJ

For this reason, on September 4, 2018, PT PALJ carried out a socialization related to the planned opening of the oil palm plantation. Minutes from the PT PALJ company meeting with community leaders.

The next thing that must be done by PT PALJ is the provision of clarity of information regarding the plan to open and construct partnership gardens, timelines and targets, the plantation management plan including the percentage sharing scheme, and grievance mechanism).

5) FPIC Phase 5 - Negotiation Process in the Community

The negotiation phase in the community has been carried out by the company contained in the minutes of the socialization and the process of land acquisition in each village. In addition, negotiations are also carried out within the framework of fulfilling MOUs or cooperation between the company and surrounding villages including agreement on the pattern of distribution of plasma nucleus gardens with proof of physical land tenure (SPORADIK), declaration of land surrender, map results, declaration release of rights and receive compensation, photos of themselves and other evidence as a sign of agreement and agreement.

6) FPIC Phase 6 - Decision-making

The agreement as a joint decision was carried out and set forth in the MOU between PT PALJ and the surrounding village is related to the Oil Palm Plantation Development plan signed by the PT PALJ, the village and witnessed by the Central Ketungau Military Commander, Central Ketungau Police Chief, and known by the Central Ketungau head district.

CHAPTER 4. Summary of Management Plans

4.1. Team responsible for development and implementation of management plans

Show the key personnel that is involved during the development and implementation of management plans.

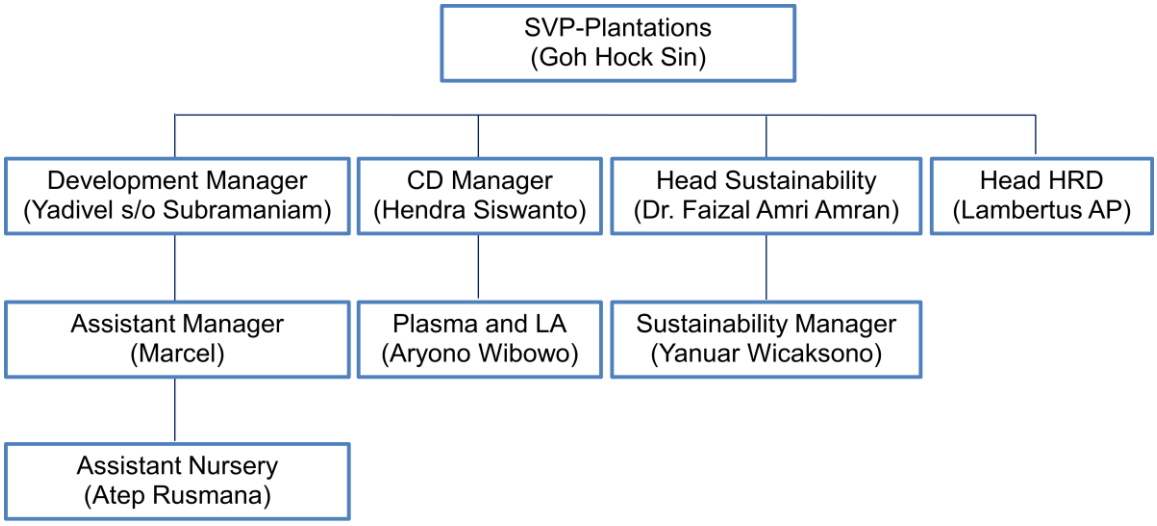


Figure 41. Team responsible for development & implementation of management plans

4.2. Stakeholder to be involved

Stakeholders are parties who give or receive influence from existence oil palm plantation in PT PALJ. The parties referred to in this study focused on key stakeholder, are parties directly, significant and interactive and give each other a sustainability stakeholder.

In addition to involving stakeholders in HCV identification, PT PALJ in the future in management and monitoring is also shared with stakeholders, such as conducting studies on the conservation of natural resources and ecosystems with the BKSDA, the Community and NGOs engaged in the environment, coordinating with companies around them, namely PT Makmur Jaya Malindo, PT Kiara Sawit Abadi and PT. Finantara Intiga and the Forestry Service in the management of HCV areas that are interconnected and coordinate and collaborate with the community and related agencies in order to prevent, protect, and overcome disturbances to the river and its boundaries, and hilly areas, as well as effective law enforcement. Stakeholder involvement is also described point 4.2.3. Elements to be included for HCV Assessment.

4.3. Elements to be included in management plans

4.3.1. Elements to be included for SEIA

Matrix of Social Environmental Management Plans in Oil Palm Plantations PT PALJ

Social and Environment Impact	Source of Impact	Indicator of Success	Form of Management	Location of Management	Management Period	Management Institution
Diversity of Community Perceptions	✓ Socialisation ✓ Making boundaries and land acquisition	Increased positive perception of the community	Socio-economic approach	Wirayuda, Swadaya, Margahayu, Wana Bhakti, Senangan Kecil, Mungguk Gelombang Village	Continue	✓ PT PALJ Management ✓ Related agencies from the regional government
Social Conflict	✓ Socialisation ✓ Making boundaries and land acquisition	Decreased social conflict	Technology approach, socio-economic approach, institutional approach	Wirayuda, Swadaya, Margahayu, Wana Bhakti, Senangan Kecil, Mungguk Gelombang Village	Continue	✓ PT PALJ Management ✓ Related agencies from the regional government
Decreasing air quality and noise	✓ Mobilization of equipment and materials ✓ Land making and land maturation ✓ Development of facilities and infrastructure	✓ PP. No. 41 tahun 1999 ✓ Kepmen LH No. Kep-45/MENLH/10/1997 ✓ Kepmen LH No. KEP-48/MENLH/11/1996	Technology approach, socio-economic approach, institutional approach	Wirayuda, Swadaya, Margahayu, Wana Bhakti, Senangan Kecil, Mungguk Gelombang Village	Continue	✓ PT PALJ Management ✓ Related agencies from the regional government
Decreasing the quality of surface water	✓ Opening and maturing of land ✓ Development of facilities and infrastructure ✓ Maintenance of immature plants	PP No. 82 Tahun 2001	Technology approach, socio-economic approach	Wirayuda, Swadaya, Margahayu, Wana Bhakti, Senangan Kecil, Mungguk Gelombang Village	Continue	✓ PT PALJ Management ✓ Related agencies from the regional government
Potential for forest and land fires	✓ Opening and maturing of land ✓ Maintenance of immature plants	There are no forest and land fires	Technology approach, socio-economic approach, institutional approach	Wirayuda, Swadaya, Margahayu, Wana Bhakti, Senangan Kecil, Mungguk Gelombang Village	Continue	✓ PT PALJ Management ✓ Related agencies from the regional government
Potential for erosion and sedimentation	✓ Opening and maturing of land ✓ Development of facilities and infrastructure	No sedimentation in the body of water	Technology approach, socio-economic approach, institutional approach	Wirayuda, Swadaya, Margahayu, Wana Bhakti, Senangan Kecil, Mungguk Gelombang Village	Continue	✓ PT PALJ Management ✓ Related agencies from the regional government

Social and Environment Impact	Source of Impact	Indicator of Success	Form of Management	Location of Management	Management Period	Management Institution
Potential damage to road and bridge infrastructure	Mobilization of equipment and materials	No damage to roads and bridges	Technology approach, socio-economic approach, institutional approach	Wirayuda, Swadaya, Margahayu, Wana Bhakti, Senangan Kecil, Mungguk Gelombang Village	Continue	✓ PT PALJ Management ✓ Related agencies from the regional government
Decreasing biodiversity	Opening and maturation of land	Biodiversity is maintained	Technology approach, socio-economic approach, institutional approach	Conservations area	Continue	✓ PT PALJ Management ✓ Related agencies from the regional government
Increased community income	Workforce recruitment, community empowerment	Increased community income	Technology approach, socio-economic approach, institutional approach	Wirayuda, Swadaya, Margahayu, Wana Bhakti, Senangan Kecil, Mungguk Gelombang Village	Continue	✓ PT PALJ Management ✓ Related agencies from the regional government

Matrix of Strategic Issues and Social Impact Management Plans in Oil Palm Plantations PT PALJ

Category	Social Strategy / Impact Issues	Community Hope	Parties involved	Target Party (Village)	Recommendations or Alternative Strategies / activities
Critical	Strategic Issues		-	-	-
	Inter-village boundary arrangements	There is no horizontal conflict between villages / regions	- District - BPN - PT PALJ, - Village Goverment, - Tokoh Adat, - Public figure	- Wana Bhakti, - Swadaya	✓ Facilitation and Mediation and participating in the settlement of village boundaries ✓ Compilation of SOPs
	Citizens' cultivation with the fire System	✓ The company can help TKD and rice field printing areas in the surrounding villages. ✓ Agricultural products and community plantations will increase in the future	- PT PALJ, - Village Goverment, - Tokoh Adat, - Public figure	- Marga Hayu, - Swadaya, - Wana Bhakti, - Mungguk Gelombang, - Senangan Kecil, - Wirayuda	✓ Hold agricultural, plantation, fishery and livestock extension activities ✓ Regular socialization of the danger of opening fields by burning ✓ Establish a Fire Care Society (MPA) in each village
	Social problem	✓ Companies can facilitate the settlement of social problems, both between villagers and companies and between villagers ✓ Residents hope PT PALJ will immediately start planting oil palm ✓ People don't expect promises ✓ Coordination between companies and villages and communities must be better.	- PT PALJ, - Village Goverment, - Tokoh Adat, - Public figure	- Marga Hayu, - Swadaya, - Wana Bhakti, - Mungguk Gelombang, - Senangan Kecil, - Wirayuda	✓ Dissemination regarding NPP plans ✓ Building a village environment as a forum for communication with stakeholders in each village ✓ Compilation of SOPs
	Poor access to village roads	Routine repair and maintenance of damaged roads from the company	- PT PALJ, - Village Goverment, - Tokoh Adat, - Public figure	- Marga Hayu, - Swadaya, - Wana Bhakti, - Mungguk Gelombang, - Senangan Kecil,	✓ Road Repair and Maintenance CSR Program ✓ Compilation of SOPs

Category	Social Strategy / Impact Issues	Community Hope	Parties involved	Target Party (Village)	Recommendations or Alternative Strategies / activities
	Negative Impact	-	-	-	-
	Concerns of residents about river pollution as a source of clean water for residents if oil palm plantations operate	✓ Companies can help residents in the provision or handling of clean water sources. ✓ Assistance for bore wells or dug wells and assistance in making water reservoirs (profiles or water tanks)	- PT PALJ, - Village official, - Pulic figure, - Citizens	- Marga Hayu, - Swadaya, - Wana Bhakti, - Mungguk Gelombang, - Senangan Kecil, - Wirayuda	✓ Community Development (Comdev) Clean Water CSR Program ✓ CSR Program Governance Mechanisms ✓ Compilation of SOPs
	Potential social conflict when land compensations is due to unclear community land boundaries	✓ Some residents expect the clarity of the land acquisition process ✓ The company must ensure the GRL process directly to the land owner	- PT PALJ, - BPN, - Head of District, - Village Goverment, - Tokoh Adat, - Citizens	- Wana Bhakti, - Mungguk Gelombang,	✓ Re-socialization of Land Acquisition ✓ Formation of village land acquisition teams ✓ Compilation of SOPs
High	***Strategic issue***		-	-	-
	Limitations on Fulfillment of Clean Water Sources	✓ Companies can help residents in the provision or handling of clean water sources. ✓ Assistance for bore wells or dug wells and assistance in making water reservoirs (profiles or water tanks)	- PT PALJ, - Village Goverment, - Tokoh Adat,	- Marga Hayu, - Swadaya, - Wana Bhakti, - Mungguk Gelombang, - Senangan Kecil, - Wirayuda	✓ Community Development (Comdev) Clean Water CSR Program ✓ CSR Program Governance Mechanisms ✓ Compilation of SOPs
	Crop failure “Sahang”	Hope for PT PALJ to be able to become a foster father if residents will change the cropping pattern from sahang / pepper to oil palm	- PT PALJ, - Farmers	- Marga Hayu, - Swadaya, - Wana Bhakti, - Mungguk Gelombang, - Senangan Kecil, - Wirayuda	✓ Penyuluhan Pertanian, Perkebunan, Perikanan, dan Peternakan
	Land compensations	✓ Residents get the compensation of land if the price can be increased again	- PT PALJ, - BPN, - Head of District,	- Marga Hayu, - Swadaya, - Wana Bhakti,	✓ Re-socialization of Land Acquisition ✓ Compilation of SOPs

Category	Social Strategy / Impact Issues	Community Hope	Parties involved	Target Party (Village)	Recommendations or Alternative Strategies / activities
		from the previous GRL ✓ Some residents expect the clarity of the land acquisition process ✓ participatory mapping regarding land owned by residents	- Village Goverment, - Tokoh Adat, - Landowners	- Mungguk Gelombang, - Senangan Kecil, - Wirayuda	
	Negative Impact	-	-	-	▪
	Forest areas began to decrease and concerns over the conversion of community plantation land from sahang / pepper, rubber into oil palm plantations	- PT PALJ's ability to become a foster fostered changes in the cropping pattern of sahang / pepper to oil palm	- PT PALJ, - Farmers	- Marga Hayu, - Swadaya, - Wana Bhakti, - Mungguk Gelombang, - Senangan Kecil, - Wirayuda	Establish partnerships / cooperation in developing community palm oil
	Changes in forest area or resources that cause a reduction in sources of fulfillment of basic needs	- There are alternatives as a substitute for forest resources	- PT PALJ, - Community Empowerment Service, - Agriculture & Plantation Service, - Village officials, - Public figure, - Citizen	- Marga Hayu, - Swadaya, - Wana Bhakti, - Mungguk Gelombang, - Senangan Kecil, - Wirayuda	✓ Extension of agriculture & plantations ✓ Compilation of SOPs
	Bringing workers from outside the village can provoke emotion, social jealousy	- The company makes it easy for its citizens to become workers / employees	- PT PALJ, - Village goverment, - Tokoh Adat, - Public firgure	- Marga Hayu, - Swadaya, - Wana Bhakti, - Mungguk Gelombang, - Senangan Kecil, - Wirayuda	- Compilation of SOPs
	Community concerns about the loss of	The company can help people who have lost their livelihood	- Company, - Community and	- Marga Hayu, - Swadaya,	- Extension of Agriculture, Plantation, Fisheries and farm

Category	Social Strategy / Impact Issues	Community Hope	Parties involved	Target Party (Village)	Recommendations or Alternative Strategies / activities
	livelihoods	after releasing their land to the company	Village Empowerment Service, - PPL of Agriculture, Plantation, Fisheries or farm Services, - Citizens	- Wana Bhakti, - Mungguk Gelombang, - Senangan Kecil, - Wirayuda	- Compilation of SOPs
	The inter-village connecting road in the form of a road as well as a road that is often crossed by workers and PT PALJ workers is in a damaged condition.	The company should carry out routine monitoring of road conditions that are passed by the residents and the roads that are passed by the company's vehicles	- PT PALJ, - Village goverment, - Tokoh Adat	- Marga Hayu, - Swadaya, - Wana Bhakti,	Compilation of SOPs
Medium	***Strategic issue***	-	-	-	▪
	Low Citizenship Education	✓ Decreasing unemployment and crime rates ✓ Residents can continue their education to a higher level. ✓ Scholarships for poor people and high achievers	- PT PALJ, - Village Drop Out Residents	- Marga Hayu, - Swadaya, - Wana Bhakti, - Mungguk Gelombang, - Senangan Kecil, - Wirayuda	- Scholarship CSR Program - Compilation of SOPs
	Unemployment	✓ Can work at PT PALJ ✓ Training and fostering unemployed citizens and dropouts ✓ Companies can help activities that can reduce unemployment and crime rates	- PT PALJ, - Village government, - Community and Village Empowerment Service, - Youth organization,	- Marga Hayu, - Swadaya, - Wana Bhakti, - Mungguk Gelombang, - Senangan Kecil, - Wirayuda	✓ CSR Training Program and local potential based Entrepreneurship Assistance ✓ Dissemination to villages related to recruitment of workers. ✓ Compilation of SOPs

Category	Social Strategy / Impact Issues	Community Hope	Parties involved	Target Party (Village)	Recommendations or Alternative Strategies / activities
			- Citizens		
	Negative impact	-	-	-	▪
	Reducing forests will have an impact on the wildlife population that is increasingly rare	- There are alternatives as a substitute for forest resources	- PT PALJ, - Community Empowerment Service, - Fisheries and farm Service, - Village officials, - Public figure, - Citizens	- Marga Hayu, - Swadaya, - Wana Bhakti, - Mungguk Gelombang, - Senangan Kecil, - Wirayuda	✓ Extension of fisheries & farm ✓ Compilation of SOPs
	Social jealousy between community leaders towards the sago hati given by the company	- There is even distribution of heart sago for every community leader	- PT PALJ, - Village government,	- Marga Hayu, - Swadaya, - Wana Bhakti, - Mungguk Gelombang, - Senangan Kecil, - Wirayuda	- Resocialization of the problem Sago hati
Low	***Strategic Issue***		-	-	
	Limitations on Marketing Access	Can work with PT PALJ in the sale of agricultural products	- PT PALJ, - Farmer	- Marga Hayu, - Swadaya, - Wana Bhakti, - Mungguk Gelombang, - Senangan Kecil, - Wirayuda	CSR program based on economic development of citizens
	Community Organization / Institution	✓ There needs to be cooperation between PT PALJ and village institutions ✓ The life of the village administration runs as it should ✓ Residents demand the active role of BPD and LPM	- PT PALJ, Village government, - - Community Empowerment Service, - Tokoh Adat	- Marga Hayu, - Swadaya, - Wana Bhakti, - Mungguk Gelombang, - Senangan Kecil, - Wirayuda	✓ Building cooperation between PT PALJ and village institutions or government ✓ Training and fostering the role of village institutions

Category	Social Strategy / Impact Issues	Community Hope	Parties involved	Target Party (Village)	Recommendations or Alternative Strategies / activities
	Limitations on Access to Information Services	✓ Support for PLTS lighting facilities for villagers	- PT PALJ, - Village government, - Tokoh Adat, - Kelompok rentan	- Marga Hayu, - Swadaya, - Wana Bhakti, - Mungguk Gelombang, - Senangan Kecil, - Wirayuda	✓ Facilitation of information infrastructure facilities (PLTS) in accordance with the company's ability for vulnerable groups ✓ Compilation of SOPs
	Negative impact			-	
	People's perception that there are no more vacant land that can be cultivated by residents	There are alternatives to replace the scarcity of arable land	- PT PALJ, - Village government, - Tokoh Adat, - Farmer	- Marga Hayu, - Swadaya, - Wana Bhakti, - Mungguk Gelombang, - Senangan Kecil, - Wirayuda	✓ Agricultural and Plantation Extension ✓ Compilation of SOPs
	Concern about the location of the plasma or the partnership garden that is far from the village position	Expect the company so that the plasma location is not far from Likasu village (adjacent)	- PT PALJ, - Village government, - Tokoh Adat, - Farmer - Koperasi	- Marga Hayu, - Swadaya, - Wana Bhakti, - Mungguk Gelombang, - Senangan Kecil, - Wirayuda	✓ Establishment of Plasma Cooperatives in each Village ✓ Compilation of SOPs

4.3.2. Elements to be included for HCV Assessment

HCV	Threats	Management Recommendation	Monitoring Recommendation
1	• Land clearing through / beyond the HCV area will cause habitat fragmentation and disruption of HCV area functions. • Road Construction and other facilities that pass through / over HCV areas will cause fragmentation and destruction of habitats for plants and wildlife and the disruption of HCV. • Decreased quality of river water due to land clearing • Road construction caused in easier access to HCV areas, so that HCV areas become vulnerable to disturbance. • Planting exotic and / or invasive plant species, so it can spread and invade HCV areas which can ultimately damage the habitat for plants and wildlife. • Development road cross country. • Illegal logging and encroachment (illegal clearing of land and fields) as a result of the absence of recognition from relevant parties regarding the boundaries and existence of HCV areas and the lack of understanding of the importance of conservation of plant and animal habitats. • Conflict of human (employess and community) with orang utan. • Orang utan and other wildlife hunting whose is protected, endemic, rare and threatened status. • The existence of forest conversion as a result of RTRWP or RTRWK changes that do not consider the existence of HCV areas, thus eliminating the existence of plants and wildlife habitast. • Forest and land fires that can damage	• Participatory boundary marking of HCV areas and Maintenance of boundary marks in the rivers borders (border width 15 – 50 meters), secondary forest and bufferzone Gn Kehuma Protected Forest. • Installing sign boards for limited hunting (eg: no hunting of protected and / or rare wild animals). • Conduct routine patrols in established of the HCV area. • Socialization of the importance of HCVs internally and externally. • Preventing, protecting and handling disruptions to HCV management areas (illegal logging, illegal logging and unlicensed gold mining) through activities: the installation and maintenance of HCV signs in strategic access points. • Conduct further surveys to ensure the presence of flora-fauna with CR status, especially Orang Utan, in collaboration with BKSDA, the Community, and NGOs that are engaged in the conservation of orangutans. • Conducted socialization and awareness campaigns to employees and community regarding of orangutans preservation and other wildlife whose status is protected, threatened, endemic and rare both directly and through various media such as leaflets, posters and prohibition boards. • Building SOPs for the Rescue of Orangutans and other wildlife whose is protected, threatened, endangered, rare and endemic status. • Established Task Force to handling Human-wildlife specially Orang Utan Conflict • Build partnerships between adjacent companies to establish orangutan corridors and early warning systems for the presence of orangutans. • Conducting rehabilitation and restoration of river border areas, bufferzone HL Gunung Kehuma and other HCV areas that act as corridors with local plant species such as Meranti, Durian and others. • Coordinate with related agencies in order to reduce illegal	• Conduct annual monitoring of HCV1 species populations in HCV Management Areas. • Develop a routine monitoring system to ensure that unauthorized hunting and mining activities can be minimized. • Conduct periodic monitoring of the effectiveness of prevention, protection and prevention activities against disturbances in HCV management areas that have been carried out. • Conduct periodic monitoring of the intensity of disruptions to river borders and hilly areas where there are water sources, including illegal hunting. • Conduct regular monitoring of potential areas for orangutan habitat. • Conduct an inventory and monitoring of food source trees for orangutans. • Conduct regular monitoring of socialization and conservation campaigns for preservation of orangutans and other wildlife species whose is protected, threatened, endemic and endangered status to employees and the community through interviews, focus group discussions. • Monitor the effectiveness of implementing SOPs to Orangutans preservation • Joint patrols on areas designated as orangutan corridors • Monitoring the presence of flora-fauna with CR status, especially orangutans • Conduct periodic monitoring of rehabilitation and restoration activities in

HCV	Threats	Management Recommendation	Monitoring Recommendation
	plants and wildlife habitats. • Weak of law enforcement. • Illegal gold mining caused river border damage, silting increased and degraded of river water quality	poaching and illegal gold mining within the concession area, as well as effective law enforcement. • Provision of patrol and fire prevention facilities. • Training of staffs PT PALJ related to (1) prevention and control of illegal logging, encroachment of area, exotic and / or invasive species, and forest and land fires and (2) public education. • Improvement / refinement of SOPs (SOPs for prevention and control of exotic and invasive species, Land Clearing SOP, SOP for Maintenance of oil palm, SOP for harvesting and transporting of palm fruit, SOP for road construction and other means, SOP for forest protection, and SOP for extension). • Coordinate with surrounding companies, namely PT Makmur Jaya Malindo, PT Kiara Sawit Abadi and PT. Finantara Intiga and the Forest Service in the management of the interconnected areas of HCVs.	boundary areas of rivers and hilly areas with water sources. • Monitoring the effectiveness of SOP-SOP implementation • Routine monitoring of the level of staff and community understanding through questionnaires and socialization. • Applying spatial-based monitoring "SMART Patrol", to obtain valid monitoring results. • Conducting joint monitoring with adjacent companies namely PT Makmur Jaya Malindo, PT Kiara Sawit Abadi and PT. Finantara Intiga and the Forest Service to the interconnected HCV areas.
2	• Land clearing through / beyond the HCV area will cause habitat fragmentation and disruption of HCV area functions. • Road Construction and other facilities that pass through / over HCV areas will cause fragmentation and destruction of habitats for plants and wildlife and the disruption of HCV. • Road construction caused in easier access to HCV areas, so that HCV areas become vulnerable to disturbance. • Development road cross country. • Illegal logging and encroachment (illegal clearing of land and fields) as a result of the absence of recognition from relevant parties regarding the boundaries and existence of HCV areas and the lack of understanding of the importance of conservation of plant and animal habitats. • The existence of forest conversion as a result of RTRWP or RTRWK changes that	• Conduct routine patrols in established of the HCV areas. • Socialization of the importance of HCVs internally and externally. • Installing HCV sign boards and warning board (eg: no hunting of protected and / or rare wild animals). • Preventing, protecting and handling disruptions to HCV management areas (illegal logging, illegal logging and unlicensed gold mining) through activities: the installation and maintenance of HCV signs in strategic access points. • Conducting rehabilitation and restoration of river border area, bufferzone HL Gunung Kehuma and other NKT areas that act as corridors with local plant species such as Meranti, Durian and others. • Coordinate with related agencies in order to reduce illegal poaching and illegal gold mining within the concession area, as well as effective law enforcement. • Provision of patrol and fire prevention facilities. • Training of staffs PT PALJ related to (1) prevention and control of illegal logging, encroachment of area, exotic and / or invasive species, and forest and land fires and (2) public	• Conduct annual monitoring of HCV 2 species populations in HCV Management Areas. • Develop a routine monitoring system to ensure that unauthorized hunting and mining activities can be minimized. • Conduct periodic monitoring of the effectiveness of prevention, protection and prevention activities against disturbances in HCV management areas that have been carried out. • Conduct periodic monitoring of the intensity of disruptions to river borders and hilly areas where there are water sources, including illegal hunting. • Monitoring the presence of flora-fauna with CR status, especially orangutans • Conduct periodic monitoring of rehabilitation and restoration activities in boundary areas of rivers and hilly areas

HCV	Threats	Management Recommendation	Monitoring Recommendation
	do not consider the existence of HCV areas, thus eliminating the existence of habitat for plants and wildlife. • Forest and land fires that can damage habitat for plants and wildlife. • Weak of law enforcement.	education. • Improvement / refinement of SOPs (SOPs for prevention and control of exotic and invasive species, Land Clearing SOP, SOP for Maintenance of oil palm, SOP for harvesting and transporting of palm fruit, SOP for road construction and other means, SOP for forest protection, and SOP for extension). • Coordinate with surrounding companies, namely PT Makmur Jaya Malindo, PT Kiara Sawit Abadi and PT. Finantara Intiga and the Forest Service in the management of the interconnected areas of HCVs.	with water sources. • Monitoring the effectiveness of SOP-SOP implementation • Routine monitoring of the level of staff and community understanding through questionnaires and socialization. • Applying spatial-based monitoring "SMART Patrol", to obtain valid monitoring results. • Conducting joint monitoring with adjacent companies namely PT Makmur Jaya Malindo, PT Kiara Sawit Abadi and PT. Finantara Intiga and the Forest Service to the interconnected HCV areas.
3	• Land clearing through / beyond the HCV area will cause habitat fragmentation and disruption of HCV area functions. • Road Construction and other facilities that pass through / over HCV areas will cause fragmentation and destruction of habitats for plants and wildlife and the disruption of HCV. • Road construction caused in easier access to HCV areas, so that HCV areas become vulnerable to disturbance. • Development road cross country. • Illegal logging and encroachment (illegal clearing of land and fields) as a result of the absence of recognition from relevant parties regarding the boundaries and existence of HCV areas and the lack of understanding of the importance of conservation of plant and animal habitats. • The existence of forest conversion as a result of RTRWP or RTRWK changes that do not consider the existence of HCV areas, thus eliminating the existence of habitat for plants and wildlife.	• Conduct routine patrols in established of the HCV areas. • Socialization of the importance of HCVs internally and externally. • Installing HCV sign boards and warning board (eg: no hunting of protected and / or rare wild animals) . • Preventing, protecting and handling disruptions to HCV management areas (illegal logging, illegal logging and unlicensed gold mining) through activities: the installation and maintenance of HCV signs in strategic access points. • Conducting rehabilitation and restoration of river border area, bufferzone HL Gunung Kehuma and other NKT areas that act as corridors with local plant species such as Meranti, Durian and others. • Coordinate with related agencies in order to reduce illegal poaching and illegal gold mining within the concession area, as well as effective law enforcement. • Provision of patrol and fire prevention facilities. • Training of staffs PT PALJ related to (1) prevention and control of illegal logging, encroachment of area, exotic and / or invasive species, and forest and land fires and (2) public education. • Improvement / refinement of SOPs (SOPs for prevention and control of exotic and invasive species, Land Clearing	• Conduct annual monitoring of HCV 3 Management Areas. • Develop a routine monitoring system to ensure that illegal logging and encroachment area can be minimized. • Conduct periodic monitoring of the effectiveness of prevention, protection and prevention activities against disturbances in HCV management areas that have been carried out. • Conducting periodic monitoring to the rehabilitation and restoration area of HCV 3 • Monitoring the effectiveness of SOP-SOP implementation • Routine monitoring of the level of staff and community understanding through questionnaires and socialization • Applying spatial-based monitoring "SMART Patrol", to obtain valid monitoring results. • Conducting joint monitoring with adjacent companies namely PT Makmur Jaya Malindo, PT Kiara Sawit Abadi and PT.

HCV	Threats	Management Recommendation	Monitoring Recommendation
	• Forest and land fires that can damage habitat for plants and wildlife. • Weak of law enforcement.	SOP, SOP for Maintenance of oil palm, SOP for harvesting and transporting of palm fruit, SOP for road construction and other means, SOP for forest protection, and SOP for extension). • Coordinate with surrounding companies, namely PT Makmur Jaya Malindo, PT Kiara Sawit Abadi and PT. Finantara Intiga and the Forest Service in the management of the interconnected areas of HCVs.	Finantara Intiga and the Forest Service to the interconnected HCV areas. • Applying spatial-based monitoring "SMART Patrol", to obtain valid monitoring results. • Conducting joint monitoring with adjacent companies namely PT Makmur Jaya Malindo, PT Kiara Sawit Abadi and PT. Finantara Intiga and the Forest Service to the interconnected HCV areas.
4	• Uncontrolled land clearing by contractors causes damage to areas that have HCVs and river silting, • Potential entry of chemicals (herbicides and fertilizers) to the water bodies that cause water quality degradation so that it can disrupt the life of water biota and its utilization for human. • Deposition and deflection of streams • The surrounding community and workers (employees) have not fully understood the importance of HCV. • The occurrence of area encroachment activities as a result of the lack of understanding of the community about the importance of the conservation of HCV. • Forest and land fires that may cause loss or loss of functional areas containing HCVs. • Weak law enforcement. • Illegal Gold mining activities on the Sengarak and Merakai Rivers that can lead to degradation of river water quality and siltation	• Participatory boundary marking of HCV areas and Maintenance of boundary marks in the rivers borders (border width 15 – 50 meters), secondary forest and bufferzone Gn Kehuma Protected Forest. • Prevention and mitigation of unlicensed gold mining in NKTA through activities: installation and maintenance of HCV signs in strategic access points, as well as patrols on a regular basis. • Installing HCV sign boards and warning board • Applied the best practices management through soil and water conservation activities in hilly areas such as terracing, sediment trap and trenches on either side of the road. • Applied land cover crops on the main road and hilly areas to minimize soil erosion. • Developing and implementing SOPs for the use of chemicals and SOPs for waste management, as well as land clearance SOP, construction and maintenance of roads and other facilities, as well as planting and maintenance of plants that minimize erosion and maintain water quality. • Ensure the construction of roads and other facilities, and land clearing has been done correctly in accordance with the SOP that has been prepared. • With the consideration that all river borders and hilly areas are now controlled by the community, it is necessary to be further discussed with the community through FPIC	• Establish a monitoring station for the physical condition of rivers, as well as the quality and quantity of water. • Conducting periodic monitoring with community of the physical condition of river s as well as the rivers water quality and quantity • Periodically monitoring illegal gold mining activities of local community. • Conduct perodic erosion monitoring. • Conduct periodic monitoring of land cover changes and regeneration naturally in river border and hilly areas. • Perform monitoring and evaluation of SOPs that are applied periodically. • Routine monitoring of the level of staff and community understanding through questionnaires and socialization. • Applying spatial-based monitoring "SMART Patrol", to obtain valid monitoring results. • Conducting joint monitoring with adjacent companies namely PT Makmur Jaya Malindo, PT Kiara Sawit Abadi and PT. Finantara Intiga and the Forest Service to the interconnected HCV areas.

HCV	Threats	Management Recommendation	Monitoring Recommendation
		activities to obtain approval whether or not to be compensated. • Coordinate and cooperate with communities and relevant agencies in order to prevent, protect, and cope with disruptions to rivers and borders, and hill areas, and effective law enforcement. • Capacity building of staff through training	
5	• The construction of roads and other facilities through the HCV area will cause damage or fragmentation of aquatic ecosystems • The potential contamination of chemicals (herbicides and fertilizers) that enter the waters, so it can affect the life of aquatic biota. • Pesticide disposal of waste plastic waste • The occurrence of illegal logging activities and encroachment area as a result of lack of understanding of the importance of the conservation of the aquatic ecosystems. • The existence of forest conversion as a result of RTRWP or RTRWK changes that do not consider the existence of HCV areas, so that will cause damage or fragmented aquatic ecosystems. • Forest and land fires that may damage or fragment the aquatic ecosystem. • Gold mining activities on the Sengarak and Merakai Rivers that can lead to degradation of river water quality and siltation. • Household waste disposal • Water pollution sourced from the disposal of waste water transportation fuel (diesel) • Harvesting of fish using poison • Weak law enforcement	• Conducting boundary marking and maintenance of boundary markings of boundary areas (border width 15 - 50 m) in a participatory manner. This activity is integrated with the management of HCVs 1 and 4. • Installing sign board to catch environmentally friendly fish (eg: do not electrocute or using harmful chemicals). • Socialization both internally and externally about activities that could potentially contaminate the river waters. • Prevent and mitigate illegal gold mining in HCVA through activities: the installation and maintenance of HCV signs in strategic access points, as well as patrols on a regular basis. • Developing and implementing SOPs for the use of chemicals and SOPs for waste management, as well as land clearance SOP, construction and maintenance of roads and other facilities, as well as planting and maintenance of plants that minimize erosion and maintain water quality. • Coordinate and cooperate with communities and relevant agencies in order to prevent, protect, and cope with disruptions to rivers and borders and enforcement effectively. • Capacity building of staff through training • Coordinate with surrounding companies, namely PT Makmur Jaya Malindo, PT Kiara Sawit Abadi and PT Finantara Intiga and the Forest Service in the management of the interconnected areas of HCVs.	• Perform routine monitoring per six months on water quality in the river waters of Merakai river, Kemawil river, Bedau river, Sekalau river, Sengarak river, Jiram river, Semansar river, Penian river dan Antu river. Monitoring activitiy integrated with HCV 4. • Develop and implement a participatory monitoring system to find the availability of basic community needs on a periodic basis. • Conduct periodic monitoring of community participation in reducing environmental impacts (eg unlicensed gold mining and use of fertilizers and pesticides in paddy fields and gardens / lading). Integrated monitoring activities with HCV 4 • Perform periodic monitoring of community perceptions of the quantity and quality of river water • Applying spatial-based monitoring "SMART Patrol", to obtain valid monitoring results. • Conducting joint monitoring with adjacent companies namely PT Makmur Jaya Malindo, PT Kiara Sawit Abadi and PT Finantara Intiga and the Forest Service to the interconnected HCV areas.
6	• The construction of roads and other facilities through HCV areas will cause damage to areas with cultural values.	• Participatory HCV 6 boundary marking and periodic maintenance of markers on the ground to prevent site disturbance from occurring.	• Develop a simple HCV 6 monitoring system that is easily understood by the community. • The Company, together with the

HCV	Threats	Management Recommendation	Monitoring Recommendation
	• Uncontrolled land clearing by contractors causes damage to areas that have HCVs • Closed community access to cultural sites and sacred sites according to the community. • The occurrence of illegal logging activities and encroachment of the area as a result of the absence of recognition from related parties about the boundaries and the existence of areas that have cultural value. • The occurrence of forest conversion as a result of RTRWP or RTRWK changes that do not take into account the existence of HCV areas, thus eliminating the existence of areas with cultural values. • Forest and land fires that can damage areas of cultural value. • Weak of law enforcement	• Involved community members during land clearing activities, especially those located adjacent to or adjacent to HCV 6 areas to avoid disruption to existing sites. • Develop SOPs for identification, boundary marking and maintenance of boundary markers in the field, as well as the protection of all HCV 6 sites together with the community. • Provide convenience to all communities to access HCV 6 sites. • Coordinate with surrounding companies, namely PT Makmur Jaya Malindo, PT Kiara Sawit Abadi and PT Finantara Intiga and the Forest Service in the management of the interconnected areas of HCVs.	community, regularly monitors HCV 6 sites and prepares its reporting. • Applying spatial-based monitoring "SMART Patrol", to obtain valid monitoring results. • Conducting joint monitoring with adjacent companies namely PT Makmur Jaya Malindo, PT Kiara Sawit Abadi and PT Finantara Intiga and the Forest Service to the interconnected HCV areas.

4.3.3. Elements to be included for soil analysis

SPL	Suitability of Actual Land		Limiting factor	Suitability of Potential Land	Repair Recommendations	Large	
	Class	Sub Class			Input Type	Ha	%
1	S2	S2nr	Nutrient Retention, Soil Acidity	S1	Fertilization, Calcification, addition of organic matter,	29,17	0,21
2	S2	s2nr	Nutrient Retention, Soil Acidity	S1	Fertilization, Calcification, addition of organic matter,	182,34	1,31
3	S2	s2enr	Topografi, Nutrient Retention, Soil Acidity, erosion	S1	Fertilization, Calcification, addition of organic matter, cover crop	25,83	0,19
4	S2	S2nr	Nutrient Retention, Soil Acidity	S1	Calcification, addition of organic matter, cover crops	1,826,92	13,14
5	S2	S2nr	Nutrient Retention, Soil Acidity	S1	Calcification, addition of organic matter, cover crops (teras)	4.128,00	29,70
6	S2	S2nr	Nutrient Retention, Soil Acidity	S1	Fertilization, Calcification, addition of organic matter	23,54	0,17
7	S3	S3enr	Topografi, Nutrient Retention, Soil Acidity,erosion	S2	Fertilization, Calcification, addition of organic matter, cover crop (terrace)	56,78	0,41
8	S2	S2enr	Topografi, Nutrient Retention, Soil Acidity,bahaya erosu	S1	Fertilization, Calcification, addition of organic matter, cover crop (terrace)	68,40	0,49
9	S2	S2nr	Nutrient Retention, Soil Acidity	S1	Fertilization, Calcification, addition of organic matter, cover crop (terrace)	25,73	0,19
10	S2	S2nr	Nutrient Retention, Soil Acidity	S1	Fertilization, Calcification, addition of organic matter	56,41	0,41
11	S2	S2enr	Topografi, Nutrient Retention, Soil Acidity, erosion	S1	Fertilization, Calcification, addition of organic matter, cover crop	34,31	0,25
12	S2	S2nr	Nutrient Retention, Soil Acidity	S1	Fertilization, Calcification, addition of organic matter	179,00	1,29
13	S3	s3nr	Nutrient Retention, Soil Acidity	S2	Fertilization, Calcification, addition of organic matter, cover crop (terrace)	123,12	0,89
14	S2	S2nr	Nutrient Retention, Soil Acidity	S1	Fertilization, Calcification, addition of organic matter	20,14	0,14
15	S2	S2nr	Nutrient Retention, Soil Acidity	S1	Fertilization, Calcification, addition of organic matter	35,89	0,26
16	S2	S2nr	Nutrient Retention, Soil Acidity	S1	Fertilization, Calcification, addition of organic matter	15,96	0,11
17	N	Ne	Not Corresponding, hilly topography	N	Conservation	445,78	3,21
18	N	Ne	Not Corresponding, hilly topography	N	Conservation	82,75	0,60
19	S3	S3enr	Topografi, Nutrient Retention, Soil Acidity, erosion	S2	Fertilization, Calcification, addition of organic matter, cover crop (terrace)	441,97	3,18

SPL	Suitability of Actual Land		Limiting factor	Suitability of Potential Land	Repair Recommendations	Large	
	Class	Sub Class			Input Type	Ha	%
20	S2	S2enr	Topografi, Nutrient Retention, Soil Acidity	S1	Fertilization, Calcification, addition of organic matter, cover crop	67,31	0,48
21	S2	S2nr	Nutrient Retention, Soil Acidity	S1	Fertilization, Calcification, addition of organic matter,	58,15	0,42
22	S2	S2nr	Nutrient Retention, Soil Acidity	S1	Fertilization, Calcification, addition of organic matter,	11,91	0,09
23	S2	S2nr	Nutrient Retention, Soil Acidity	S1	Fertilization, Calcification, addition of organic matter,	10,03	0,07
24	**S2**	**S2nr**	**Nutrient Retention, Soil Acidity**	**S1**	The type of peat soil is not opened	**18,90**	**0,14**
25	**S2**	**S2enr**	**Topografi, Nutrient Retention, Soil Acidity, erosion**	**S1**	The type of peat soil is not opened	**25,48**	**0,18**
26	S2	S2nr	Nutrient Retention, Soil Acidity	S1	Fertilization, Calcification, addition of organic matter,	29,21	0,21
27	S2	S2nr	Nutrient Retention, Soil Acidity	S1	Fertilization, Calcification, addition of organic matter,	29,97	0,22
28	S2	S2enr	Topografi, Nutrient Retention, Soil Acidity, erosion	S1	Fertilization, Calcification, addition of organic matter, cover crop	90,02	0,65
29	S2	S2nr	Nutrient Retention, Soil Acidity	S1	Fertilization, Calcification, addition of organic matter,	44,37	0,32
30	S3	S3enr	Topograsi agak curam, retensi hara dan tingkat kemasaman tanah	S2	Fertilization, Calcification, addition of organic matter, cover crop, terasering	10,53	0,08
31	S2	S2nr	Nutrient Retention, Soil Acidity	S1	Fertilization, Calcification, addition of organic matter,	665,79	4,79
32	S2	S2enr	Topography is rather steep, nutrient retention and soil acidity, erosion	S1	Fertilization, Calcification, addition of organic matter, cover crop,	484,50	3,49
33	S2	S2nr	Nutrient Retention, Soil Acidity	S1	Fertilization, Calcification, addition of organic matter,	467,12	3,36
34	S2	S2nr	Nutrient Retention, Soil Acidity	S1	Fertilization, Calcification, addition of organic matter,	3.396,42	24,43
35	S2	S2enr	Nutrient Retention, Soil Acidity	S1	Fertilization, Calcification, addition of organic matter,	264,05	1,90
36	S2	S2nr	Nutrient Retention, Soil Acidity	S1	Fertilization, Calcification, addition of organic matter,	95,11	0,68
37	S2	S2nr	Nutrient Retention, Soil Acidity	S1	Fertilization, Calcification, addition of organic matter,	31,63	0,23
38	S2	S2nr	Nutrient Retention, Soil Acidity	S1	Fertilization, Calcification, addition of organic matter,	13,11	0,09
39	S2	S2nr	Nutrient Retention, Soil Acidity	S1	Fertilization, Calcification, addition of organic matter,	181,65	1,31
40	S2	S2enr	Topografi landai, Nutrient Retention, Soil Acidity	S2	Fertilization, Calcification, addition of organic matter, cover crop,	102,70	0,74
					Total	**13.900**	**100**

4.3.4. Elements to be included for carbon stocks and GHG emissions

No	Mitigation	Monitoring	Protected Area
1.	Marking participatory protected area boundaries	Maintenance of protected area boundary signs periodically.	HCV area, disturb forest, peat land (Non HCV)
2.	Dissemination of boundary signs and protected areas to contractor and PT staff who handle land clearing, construction of roads and other facilities, and maintenance of oil palm plants, harvesting and transportation of palm fruit.	Understanding of contractor / UM staff is related to boundaries and boundaries of protected areas, extension services, and prevention and control of forest and land fires, illegal logging and encroachment in protected areas	HCV area, disturb forest, peat land (Non HCV)
3.	Socialization of protected areas to surrounding communities	Understanding of surrounding communities is related to the boundaries and boundaries of protected areas, education, and prevention and control of forest and land fires, illegal logging and encroachment in protected areas	HCV area, disturb forest, peat land (Non HCV)
4.	Prevention and control of fire and encroachment disturbances in protected areas through the establishment of task forces	Periodic patrol	HCV area, disturb forest, peat land (Non HCV)
5.	Inventory and identify land cover in protected areas	Monitor the structure and composition of vegetation	HCV area, disturb forest
6.	Rehabilitation and enrichment planting in protected areas	Realization and percentage of life of plants planted in rehabilitation and enrichment activities.	HCV area, disturb forest
7.	Water management so that there is no subsidence and drought.	Monitoring water level especially during the dry season	peat land (Non HCV)

CHAPTER 5. REFERENCES

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Social Impact Assessment (SIA) Report of PT Palma Agro Lestari Jaya, date October 2018, Conduct and Prepare by Sigit Pamungkas. West Java, Indonesia

CHAPTER 6. INTERNAL RESPONSIBILITY

The oil palm grower signs to confirm that the necessary assessment have been done and completed in accordance to the relevant RSPO procedure.

Sign of behalf SIA Assessor

Sigit Pamungkas, SP., M.Si.
Lead Assessor
Date : 30 oktober 2018

Sign of behalf HCV Assessor

Ir. Kresno Dwi Santosa, M.Si.
PT Sonokeling Akreditas Nusantara
Date : 29 Oktober 2018.

Sign of behalf LUCA Assessor

Kasuma Wijaya, S.Hut., M.Si.
Lead Assessor
Date : 29 Oktober 2018

Sign of behalf CSA Assessor

Kasuma Wijaya, S.Hut., M.Si.
Lead Assessor
Date : 29 Oktober 2018

The implementation of the management and mitigation plan will be carried out, to follow each of the proposed management plan.

PT. PALMA AGRO LESTARI JAYA

Dr. Faizal Amri Amran
Head Sustainability

Date : 31 / 10 / 18

Contact Person :

PT. Palma Agro Lestari Jaya

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