ASSESSMENT SUMMARIES and MANAGEMENT PLANS
PT AGRIPLUS
Sub-District of Marau & Jelai Hulu, District of Ketapang
West Kalimantan Province

1. Preliminary

1.1 Executive Summary

PT Agriplus is one of the oil palm plantation companies operating in Ketapang - West Kalimantan. The location permit of PT Agriplus is covering 6,100 ha which have been opened by the previous management since 2006, then was taken over by Bumitama in 03 April 2017.

The first location permit for development area of PT Agriplus was obtained in 05 May 2006 with the Decree of the Ketapang Regent No. 121 year 2006. The last change was on 05 August 2010 with number 436 of 2010 covering an area of 6,100 ha.

In line with Bumitama Sustainability Policy and the RSPO New Planting Procedures which came into force beginning 1 January 2010, PT Agriplus had recently conducted the Social Environment Impact Assessment (SEIA/ AMDAL), High Conservation Value (HCV) identification, Social Impact Assessment (SIA), Carbon Stock Assessment and Land Use Change Analysis (LUCA), HCS and soil delineation assessment of this area, so that Bumitama can ensure no HCV, HCS, and peat area will be cleared as per the Sustainability Policy of Bumitama and to be in compliance to the RSPO P&C.

The assessments were conducted from 5 July – 5 November 2017, involves pre-assessment (5 July-2 August 2017) and assessment phases (9 August-5 November 2017) by Gagas Dinamiga Aksenta (Aksenta) which the key consultants conducting these assessments who have been approved by HCVRN Assessor Licensing Scheme, and the report has been declared satisfactory by HCVRN Quality Panel on 9 January 2020.

The results of the HCV assessment and LUC analysis had shown that there is no primary forest in the concession of PT Agriplus. The land cover is dominated by the oil palm (51.3%), agroforestry (19.4%), and young shrub (16.2%). The total area of HCV (including HCVMA area) based on Public summary report covering 1,974.5 ha (32.3%), this identified HCV area includes 6 types of HCV. Meanwhile, in the HCS study, no High Priority Patch (HPP) was found, the Medium Priority Patch (MPP) was found which was later identified as an HCS area, has been categorized as an HCV Area in the previous assessment.

As stated on the HCV Report, the most important recommendation is to delineate and demarcate the identified HCV areas, to determine the definitive conservation area of PT Agriplus. Therefore, in this NPP document, PT Agriplus will present and submit a management plan in accordance with the results of the delineation that has been carried out, by integrating the HCV report, HCS report and groundtruthing.

The differences between what was stated in the Public Summary is in the area of the hills and rivers

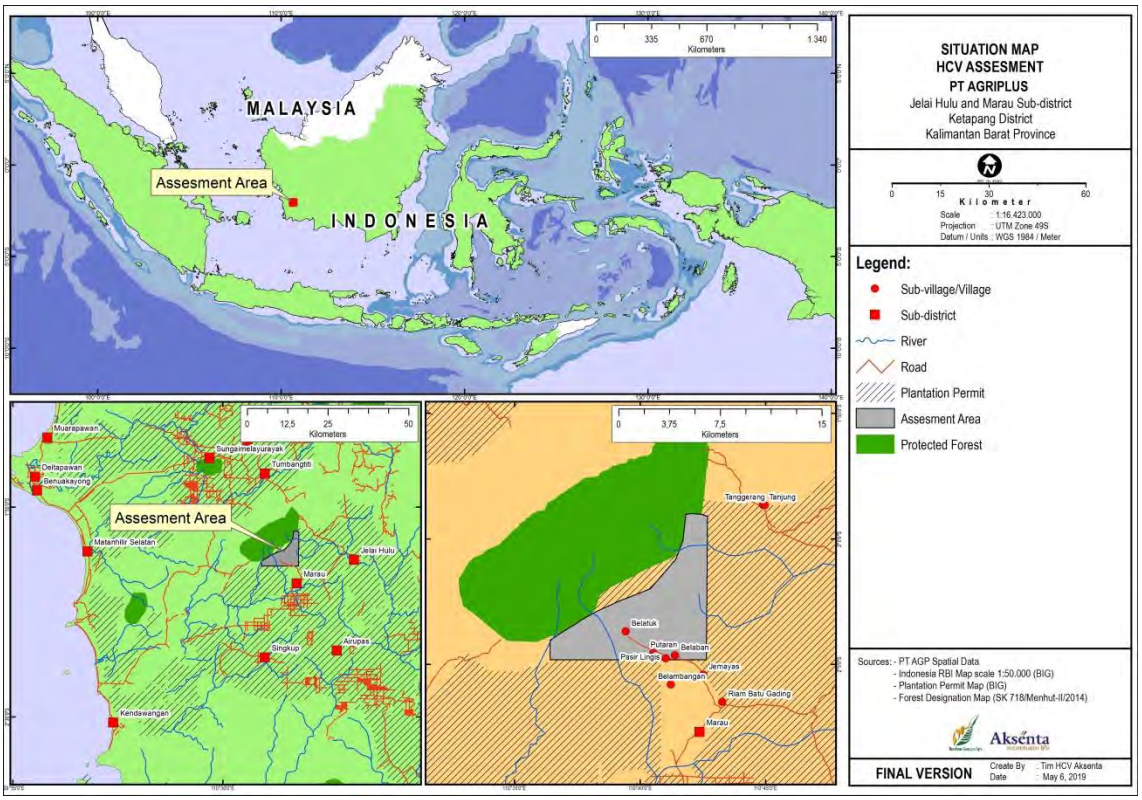
that have been delineated. As the result from HCV area delineation, Agriplus has an conservation area (including HCV, HCS and HCVMA) covering **2,125.86** ha (35%). This total conservation areas will be included in the monitoring and socialization plan with the local communities.

The results of the Social Impact Assessments (SIA) have shown that the company's development of oil palm plantation has positive impacts toward local livelihood and the society's social sustainability. Generally, the communities support the development of oil palm plantation by PT Agriplus. One of the main expectations of the people is the creation of jobs for the local community, transparency and clarity of plasma management, the development and improvement of social facilities/ public, business opportunity or cooperation with the company.

1.2 Scope of SEIA and HCV Assessment

Organizational Information/ Contac Person

Company Name	:	PT AGRIPLUS
Company Address	:	Jalan Melawai Raya No. 10, South Jakarta Jakarta- Indonesia, 12160
Type of business	:	Oil Palm Plantation
Capital Status	:	Foreign Investment (*Penanaman Modal Asing, PMA)*
RSPO Membership Number	:	1-0043-07-000-00
Location of Plantation	:	Village of Belaban and Riam Batu Gading, Sub-district of Marau Village of Tangerang (Tanjung), Subdistrict of Jelai Hulu District of Ketapang, West Kalimantan
Geographical Location	:	02°04'09" - 02°04'8.6"S 110°36'25" - 110°42'38" E See Map 1
Surrounding Entities		North : Protected Forest Area of Gunung Raya South : Plantation Area of PT Kencana Graha Permai West : Plantation Area of PT Budidaya Agro Lestari East : Plantation Area of PT Andes Sawit Mas
Contact person	:	Lim Sian Choo Phone : +62-21-27838200 Fax : +62-21-72798665 Email : lim.sian.choo@bumitama.com
Website	:	www.bumitama-agri.com



Map 1: Location of PT AGRIPLUS in Sub-district of MArau & Jelai Hulu, Distrct of Ketapang, West Kalimantan Province

1.3 List of Legal, Regulatory Permits and Property Deeds

Proses pemenuhan legalitas yang dilakukan oleh PT AGRIPLUS sudah dilakukan sejak tahun 2005. PT AGRIPLUS didirikan berdasarkan Akta Notaris Hendrik Priyanto, SH Nomor 12 tanggal 14 November 2013 dan dicatat dalam database Sistem Administrasi Badan Hukum Kementerian Hukum dan Hak Asasi Manusia Republik Indonesia Nomor AHU-AH.01.10-53669 tanggal 11 Desember 2013.

Table 1: Types of permits and recommendations PT Agriplus

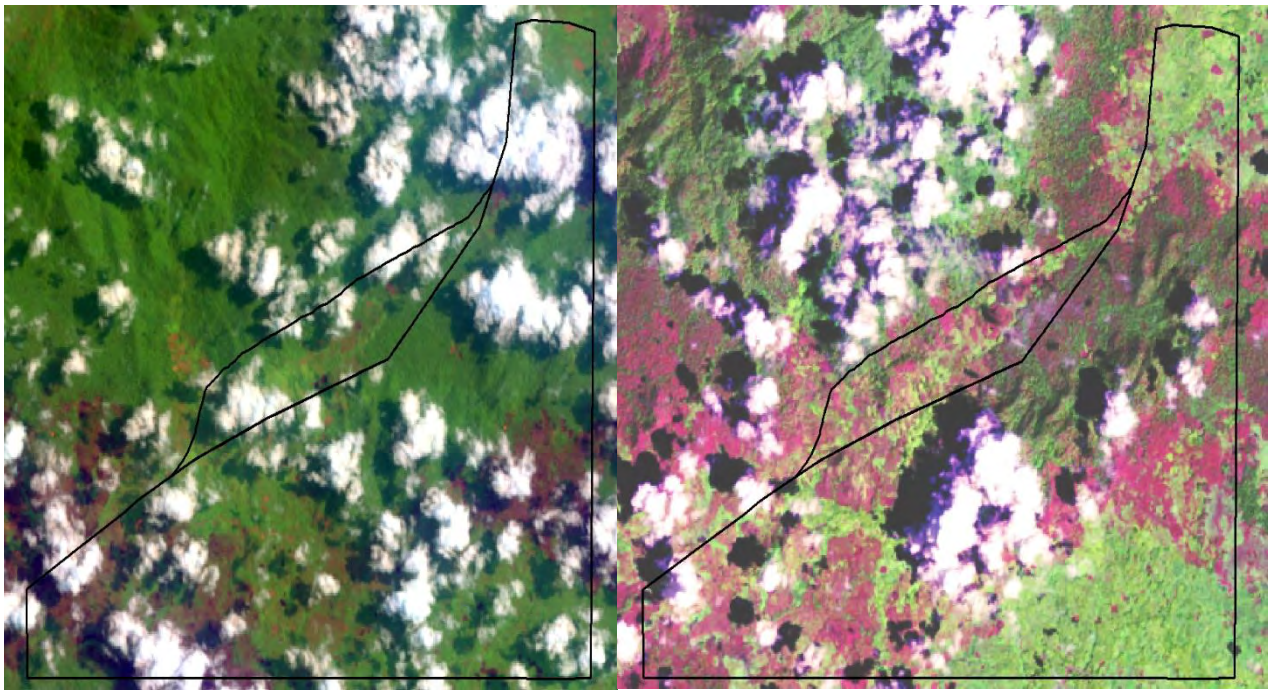
No	Licenses and/or Recommendations	Number	Dateof Issued	Area (ha)
1	Principle Permit	525/231/IV-Bapedalpembda	27 Mei 2005	6,750
2	Land Information	525/441/DPU-E	25 Agst 2015	400
3	Review survey permit	072/404/IV-Bapeda/pemda	30 Agsts 2005	6,750
4	Location Permit	121 Tahun 2006	05 Mei 2006	6,750
5	Revision of Location Permit	175 Tahun 2008	02 April 2008	6,100
6	Renewal of Location Permit	417 Tahun 2009	19 Nov 2009	6,100
7	Change of Location Permit	436 Tahun 2010	05 Agsts 2010	6,100
8	Environmental feasibility permit	168/BLHD/2010	24 Maret 2010	
9	Plantation Business Permit (IUP)	551.31/0584/DISBUN-C	15 Maret 2006	6,000

No	Licenses and/or Recommendations	Number	Dateof Issued	Area (ha)
10	Renewal of Plantation Business Permit (IUP)	440 Tahun 2010	06 Agsts 2010	6,100
11	Committee B	37/HGU-HTPT/BPN/2013	15 Nov 2013	1,000
12	Cultivation Rights	49/HGU/KEM-ATR/BPN/2015	20 Mei 2015	927.04

1.4 Historical of Land

Since around 1970 the local community has used the land by planting fruit trees and rubber to make a living for the local community. This activity is still ongoing today. About 19% of the land cover in the study area is agroforest which contains fruit trees and rubber trees planted at that time. Changes in forest land cover to non-forest due to human activities have been known for a long time. Human activities on this land cover affect the type, intensity and frequency of land cover change (Curtis 1956; Burgess and Sharpe 1981).

Around 1997-1998, fires occurred in the vicinity of the study area (PT AGRIPLUS), which was concentrated in the foothills in the east to northeast. These fires changed part of the secondary forest land cover in the areas where the fire was burning. However, the fires did not deplete the agroforest cover of the communities in the south-southeast of the study area.



Map 2: Satelite Image of Agriplus, August 1997 (left) - Satelite Image of Agriplus, January 1998 (rigth)

Apart from agroforest cover, natural cover in the study area still has very good vegetation conditions. Currently, the community routinely utilizes non-timber forest products in the form of fruit or rubber latex from agroforest areas. In addition, the surrounding community also uses wood products, farming and hunting in areas that have secondary or outer forest cover. The community still uses the land in agriculture or Lakau. The results of the use of wood that the community does are used for personal purposes which are used to build houses. Meanwhile, the commodities of these fields are

sweet potatoes, sugar cane and rice. In Ketapang Regency in general, there was a decrease in the amount of forest land cover in 1992-2002 conversion to agricultural land cover and shrubs or shrubs (Adhikerana dan Sugardjito 2010).

Figure 1: Illustration of the use of wood and non-timber forest products by the community around the study area

In 2005 PT Agriplus entered with a letter from the Regent of Ketapang Number 525/231 / IV-Bapedalpemda. A year later the application for PT Agriplus's plantation business permit was approved by the Regent of Ketapang with a letter from the Regent of Ketapang Number 551.31 / 0584 / DISBUN-C dated March 15, 2006. In 2006, PT AGRIPLUS also obtained a location permit for Oil Palm Development Needs covering an area of 6,750 hectares. Three years later, the PT Agriplus location permit received a renewal which reduced the PT Agriplus permit area to 6100 Ha. This is because several parts of the PT Agriplus concession are included in the Gunung Raya Protected Forest area. In 2015, PT Agriplus obtained a plantation business permit covering an area of ± 6100 hectares through the Decree of the Regent of Ketapang Number 436 of 2010 dated August 5, 2010. After obtaining an IUP, PT AGRIPLUS started its activities in planting oil palm commodities. Based on the planting year map, the first planting at PT AgripluS started in 2011. The clearing of land was allegedly carried out in 2010-2011 before planting was carried out. In 2015, PT AGRIPLUS obtained a land use permit (HGU) covering an area of 927.04 hectares based on Letter of Measure No. 80 / Ketapang / 2015 dated August 13, 2015 with HGU Certificate No. 129 dated August 13, 2015. This HGU is located in Marau District, Ketapang Regency. Then in early April 2017 PT Agriplus was acquired by BGA as a sub company belonging to the BGA group. All land clearing in the period November 2005 - before the acquisition took place, was cleared by a company with non-RSPO member status.

Along with the plantation activities, the community around the PT Agriplus area continues to carry out timber utilization activities. In addition to utilizing wood, the community also continues to carry out agricultural activities and the community still uses their mixed farms or agroforest, such as harvesting rubber and fruit from the farm.

1.5 Area and time-plan for new plantings

The proposed new planting area by PT Agriplus is in the location of the new Plantation Business Permit (Izin Usaha Perkebunan, IUP) which have been agreed by the owners of the land will be made available to the company through the FPIC (free, prior and informed consent). Land development and planting of oil palm will begin by following the procedures of the RSPO New Planting Procedures (NPP), using NPP Guidelines 2015, as permitted by RSPO via email 15 September 2021.

Table 2: The summarized of land use and time-plan for new plantings

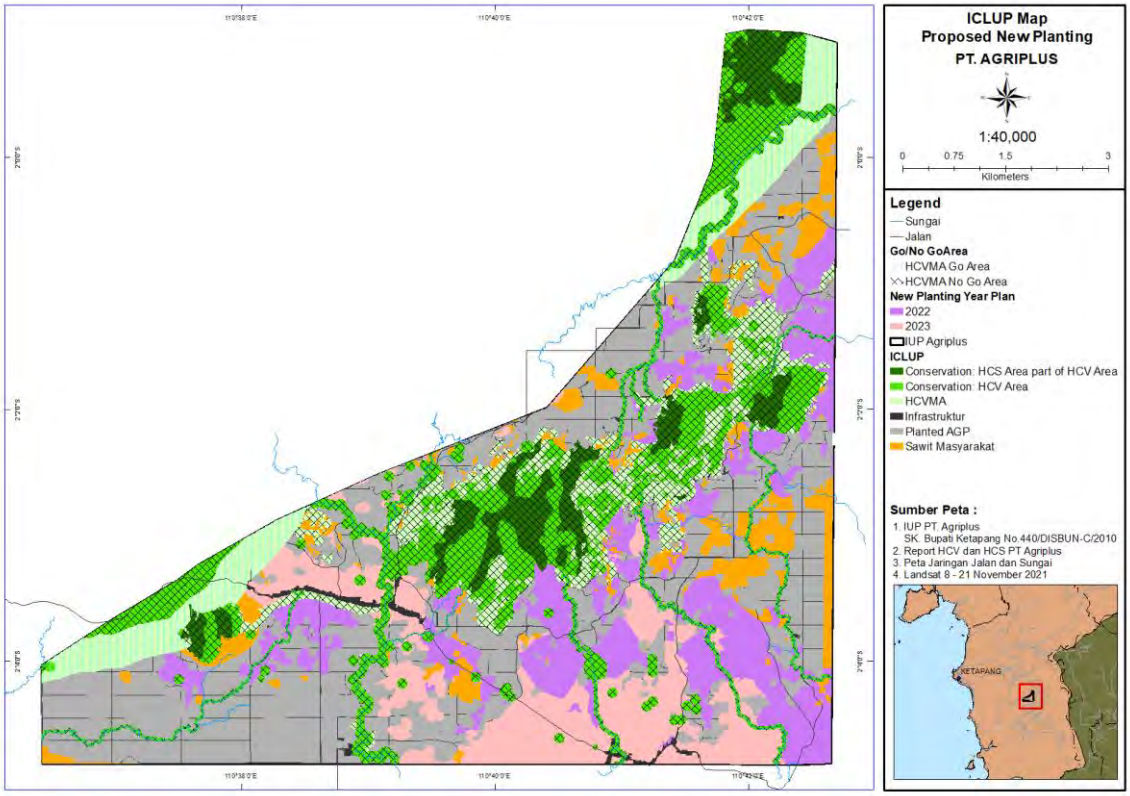
Description		Area	
		Ha	**%**
A. Development Area		**2,456.40**	40%
Company Palm Oil	1,939.27		
Community Palm Oil	413.80		
Infrastructure	103.33		
B. Conservation Area		**2,125.86**	35%
HCV*	1,029.03		
HCS Part of HCV	340.82		
HCVMA	756.00		
C. Area Proposed for New Planting**		**1,527.29**	25%
2022	860.57		
2023	666.72		
Total Area (A+B+C)		**6,109.55*****	**100%**

**The explanation of the difference between HCV areas with the public summary document, please refer to section executive summary*

***This is a plan for planting in 2 years, it could be longer, but still considering the validity period of the NPP in accordance with the NPP guidance*

***There is a difference between what is written on the IUP & On the shp file provided by the relevant agencies. This may caused by an error in digitization.*

Map 3: Land Use & Planting Projection of PT Agriplus



2. Assessment Process and Procedures

2.1 Assessor and Their Credentials

2.1.1 Social Environment Impact Assessment (SEIA/ AMDAL)

The SEIA/ AMDAL document of PT Agriplus was prepared by consultant from CV Inhasa Persada which located in Jl. Putri Candramidi No. 67 I/A Pontianak, west Kalimantan Province. It has been approved by Head of Ketapang Regent according to the letter number 168/BLHD/2010, dated 24 March 2010.

Table 3: Person and Expertise SEIA Team Assessor at PT Agriplus

No.	Name	Position
1	Stefan Agung Dhewandhanu Wahyudi, S.Si	Team Leader. Biological Expert
2	Ir. Sigit Sugiardi, MP	Co-Leader. Chemical Physics Expert
3	Ir. Edy Syafril Hayat, MP	Member. Chemical Physics Expert
4	Dian Susanti, ST	Member. Chemical Physics Expert
5	Yuan Adhi Negara, S.Pi	Member. Chemical Physics Expert
6	Nurul Pudji Nurwulan, S.Si	Member. Biological Expert
7	Endang Mulyadi A.K., S.Hut., M.Si	Member. Socio-cultural Expert
8	Dian Tamalia Rumoga, SKM	Member. Socio-cultural Expert

2.1.2 Social Impact Assessment (SIA)

The first Social Impact Assessment of PT Agriplus was carried by Aksenta. The field study was carried on 9 - 15 Agustus 2017.

Then, To find out the latest social impact conditions, the social impact assessment has been

updated in March - June 2021, by Ecotrop Consultant, with the composition of team is as follows:

Table 4: Updated SIA Team Assessor

No.	Name	Position	Expertise
1	T. Ade Fachlevi	Team Leader	*Social Economic & stakeholders engagement and FPIC* expert
2	Bias Berlio P	Team Member	*Social mapping & community development expert*
3	Reza Abdillah	Team Member	*GIS & land use specialist*

2.1.3 High Conservation Value Identification (HCV)

The HCV assessment conducted on July to August 2017 in the Permitted Area (Izin Lokasi) of PT Agriplus was carried by Gagas Dinamiga Aksenta (Aksenta), which located at Jln. Gandaria VIII/10 Kebayoran Baru, Jakarta - Indonesia 12130. Webpage www.aksenta.com
This HCV document has been reviewed by the HCVRN and was declared satisfactory in 9 January 2020, please refer to the following link:
https://hcvnetwork.org/reports/hcv-pt-agriplus-kabupaten-ketapang-provinsi-kalimantan-barat-indonesia/

This HCV identification was conducted together with High Carbon Stock (HCS) Assessment & Land Use Change Analysis (LUCA).
Key consultants from Aksenta have been accredited and approved by HCVRN Assessor Licensing Scheme (ALS). The team members are on Table 5.

Table 5: Key consultants HCV Assessment

Name	ALS Licence	Role	Expertise
Nandang Mulyana nandang@aksenta.com	Provisional ALS15037NM	Team Leader. Assessment field: socio-cultural aspects (HCV 5 and 6)	Socio, economic, cultural and environmental aspects. He is an expert of economic valuation and analysis and area planning.
Adhy Widya Setiawan adesahy@gmail.com	*N/A*	Team Member. Assessment field: biodiversity (HCV 1-3)	Wildlife survey and management, and ecosystem
Fersely Getsemani Feliggi Salmon getsa@aksenta.com	*N/A*	Team Member. Assessment field: environmental services (HCV 4)	Hydrology, soil conservation, spatial analysis and remote sensing, and water management system
Zakaria Al-Anshori zakaria.forester@gmail.com	*N/A*	Team Member. Assessment field: flora and ecosystem	Botany. He has capacity to identify flora species in the field
Aulia Bahadori Mukti aulia@aksenta.com	*N/A*	Team Member. Assessment field: soil and environmental services	Soil survey in soil suitability assessments for agriculture and plantation, and peat soil conservation assessment
Noor Rakhmat Danumiharja noor@aksenta.com	*N/A*	Team Member. Assessment field: socio cultural aspects	He is a legal specialist, and forest policy analyst

Name	ALS Licence	Role	Expertise
Ali Akbar Hutzi ali.hutzi@aksenta.com	*N/A*	Team Member. Assessment field: socio-economic aspects	Socio-economic and cultural, and environmental economic fields
Nurindah Ristiana indah@aksenta.com	*N/A*	Team Member. Assessment field: GIS and field mapping specialist	Specialist of GIS and field mapping in biodiversity research

2.1.4 Carbon Stock and High Carbon Stock Assessments

The carbon stock and High Carbon Stock Assessments at PT Agriplus were carried out concurrently with the HCV Assessment, August to October 2017.

This document has been reviewed by the HCS Approach review on September 220 and published on the HCS website with the following link:
https://highcarbonstock.org/wp-content/uploads/2020/10/2.-Final-Peer-Review-Report_PT-AGP_23092020.pdf

This study was carried out by a team consisting of ten members:

Table 6: Key Consultant of HCS Assessment

Name	Expertise	Role
Bias B Pradyatma	HCSA Assessment (*registered practitioner*), carbon stock assessment, forest inventory	Patch analysis decision tree
Risa Desiana Syarif	HCSA Assessment (*registered practitioner*), land use/land cover analysis, remote sensing, GIS analysis, forest management	Patch analysis decision tree, land cover classification
Ryan Karida Pratama	HCSA Assessment (*registered practitioner*), carbon stock assessment, forest inventory, land use/land cover analysis, GIS analysis, remote sensing	Patch analysis decision tree, FPIC Study
Aulia B Mukti	Forest inventory, carbon stock assessment, soil surveys	Forestry inventory, Soil survey
Priyo D Utomo	Forest inventory, carbon stock assessment, GIS analysis and remote sensing	Forestry inventory, Land cover classification
Ahmad Sirojudin	Forest inventory and carbon stock assessment	Forest inventory, land cover classification, plant identification
Rahmat Darmawan	Forest inventory and carbon stock assessment	Forest inventory, land cover classification, plant identification
Ali A. Hutzi	FPIC studies, social HCV studies, social economic surveys, social impact assessment	FPIC Study
Ahmad A. Hilman	FPIC studies, social impact assessment and social HCV studies	FPIC Study
Noor R. Danumiharja	FPIC studies, social impact assessment and social and economical surveys	FPIC Study

2.2 Assessment Methods

2.2.1 Social Environment Impact Assessment (SEIA/ AMDAL)

The data collection process was strongly associated with the type of data to be collected. In general, studies will be conducted based on primary data and secondary data. Primary data are obtained through observation, measurement and field interviews, and secondary data are

obtained from the literature collected, either from the company, or directly from related institutions in the study of this area. The methods that were used to collect the data were adjusted with components that can be studied. The used data must be accurate and reliable so that it could be used to analyzed, measure and observe the environmental components which it predicted would be affected and components of action plan that would give significant impacts to the surroundings. The data were collected was as follow:

- Physical – Chemical Components (Climate, Air Quality and Hydrology, and Soil).
- Biological Components (Vegetation, Animals, and Water Biota).
- Socio-Economic Cultural Components (Demography/ Population, Social, Economic, Social and Cultural).
- Environmental Health and Public Health Components (Environmental sanitation, public health level, level of public health services).

Methods of Significant Impact Estimation

Determination of the significant impact to the environment caused by the development activities of the plantation is only intended as an attempt to estimate the large and important environmental quality changes that can be caused by the plantation development activities of PT Agriplus in Sub-district of Marau and Jelai Hulu, District of Ketapang, West Kalimantan Province. The method of significant impact estimation used is by differentiating the magnitude of impact and significance of impacts.

Estimation on the Magnitude of Impact

The magnitude of Impact is measured from the changes in the environmental quality. Formal and informal methods are used to estimate changes in environmental quality.

1. Formal Methods
   Formal methods are used to estimate the impact of parameters which the system characteristics can be identified or estimated by using the approach of environmental threshold at national and regional levels.

2. Informal Methods
   Informal method is a method that based on the professional judgment of experts, logical frame analysis and analogy. This method is use to estimate the environmental parameters which characteristics system finds difficult to identify or estimated by modeling approach such as socio-cultural systems.

Determination of Important Impact Characteristics

Assessment of the important impact characteristics were in accordance to BAPEDAL decision Number: KEP-056 of 1994 on Guidelines Regarding Significant Impacts size. Meanwhile, in relation to the impact evaluation conducted by Important Impact scaling into two categories: important and less important. Characteristics Impact divided into two groups, negative impacts and positive impacts. It will be regarded as negative if the changes/ impact estimated is get adverse towards the environmental, and it is positive if the changes/ impact estimated giving beneficial to the environment.

Methods of Important Impact Evaluation

The Important Impact evaluation explore "holistic causative" against expected environmental components that is affected. For this purpose the supporting tools used is interactions matrix. Interactions matrix between activity components and environmental component contain magnitude of Impact and Importance of Impact. This Important Impact evaluation will be conducted careful and with thorough study to the primary impact (positive / negative) and secondary impacts (positive / negative), and also other derivative impacts on the environment component and activities component.

The study on the important source impact and hypothetical impact can identify the key issues that need to be managed. Results of the Important impact evaluation are also expected to assist the decision making process in the selection of a viable alternative plan that takes into consideration of the environmental aspects of the proposed area.

2.2.2 Social Impact Assessment (SIA)

Data used

Secondary data is obtained from statistical data, and documents of social and environmental studies that have been carried out.

Table 7: Source of Secondary data

No	Sumber data
1	Laporan *Social Impact Assessment* PT AGP, 2017
2	Data Kependudukan, (Dinas Kependudukan dan Catatan Sipil Kabupaten Ketapang, 2019)
3	Kecamatan Jelai Hulu Dalam Angka, (BPS, 2019)
4	Kecamatan Marau Dalam Angka, (BPS, 2019)
5	Indeks Pembangunan Desa Tanggerang, 2021
6	Indeks Pembangunan Desa Belaban, 2021
7	Indeks Pembangunan Desa Riam Batu Gading, 2021
8	Laporan *High Conservation Area Assessment* PT AGP, 2017
9	Laporan Realisasi CSR PT KBAS – PT AGP Wilayah 7B, 2019-2020
10	Data karyawan PT AGP, 2021
11	Analisis Dampak Lingkungan Hidup PT AGP, 2010
12	Adendum Analisis Dampak Lingkungan Hidup PT AGP, 2017

The primary data used in this assessment was obtained through a survey using the Rapid Appraisal Method, as follows:

- Key Informant Interview. This interview consists of a series of open-ended questions. Key informants are certain individuals who are selected because they are considered to have knowledge and experience regarding the topic or situation in the assessment area. Interviews were qualitative, in-depth, and semi-structured. According to Sugiarto et al (2001) in the interview, the results obtained can be accounted for qualitatively

and have a high value. All misunderstandings can be avoided, the prepared questions can be answered by the informants with additional explanations and each question can be developed further.

- Direct Observation (Direct Observation). Conduct direct observations of the social conditions of the local community. The data collected consists of information on geographical conditions, socio-economic conditions, natural resources, infrastructure, ongoing programs, social interactions, potential conflicts, the role of women, etc.
- Focus Group Discussion (FGD) is a method and technique in collecting qualitative data in which a group of people discuss a particular focus on a problem or topic guided by a moderator (Indrizal, 2014). The FGD in this study was conducted to obtain information and lessons related to social conditions, social problems, social impacts, and others. In the process, this activity is guided by a facilitator with key questions that are easy to understand, so that the community can actively participate in this activity

Sampling technique

The local communities that were sampled for the assessment were villages that had direct interaction with PT Agriplus. The criteria used to determine which villages have direct interaction with PT Agriplus are the administrative boundaries of the village and the boundaries of the current PT Agriplus IUP concession.

The sampling technique for resource persons in each community, workers and stakeholders in this assessment used purposive sampling and snow ball sampling. Purposive sampling technique was used to determine resource persons who could represent the community that had direct interaction with PT Agriplus. Meanwhile, the snow ball sampling technique was used for other informants who had an in-depth understanding of the purpose of the assessment.

Table 8: Number of Source Person based on Role and Gender

No	Source Person	Number of Person	Gender	
			Male	Female
Community Representatives		22	17	5
1	Village of Belaban	5	5	0
2	Village of Riam Batu Gading	7	7	0
3	Village of Tanggerang	10	5	5
Workers		6	3	3
4	BKRE	6	3	3
Stakeholder		21	18	3
5	Management of PT Agriplus & BGA	21	18	3
Jumlah		49	38	11
Persentase Menurut Jenis Kelamin			78%	22%

2.2.3 HCV Assessment

This assessment process comprises pre-assessment and assessment phases, following the Common Guidance for the Identification of HCV (Brown *etal*., 2013). Pre-assessment phase includes collecting preliminary data and information, planning and preparation for assessment phase, while assessment phase includes field data collection and analysis, as well as consultation.

1. **Timeline**

The HCV assessment was conducted from July to November 2017. This assessment encompasses all activity phases including stakeholder consultation, data analysis, and reporting (**Table 9**).

Table 9: HCV assessment timeline

Phase	Objective	Activity	Time
PRE-ASSESSMENT			
Pre-assessment and preparation	• Identify potentials and indications of the presence of HCV attributes or elements • Identify potential HCVAs • Understand better landscape context • Identify conservation issues and potential threats to HCV • Select method, survey design, assessment team, and field activity timeline	• Collect initial data and information from the company on plantation development and management status	5 July - 2 August 2017
		• Collect initial data and information from secondary sources (report, journal, books, statistic, basemap) and informants	
		• Perform data and spatial analyses	
		• Field surveys pre-assessment	29 July-2 August 2017
ASSESSMENT			
Opening meeting	• Communicate purpose and objectives of the HCV Assessment • Collect additional data and information on plantation development and management status • Build management unit's understanding on HCV: background, purpose and objective, concept, HCV types, attributes or elements, and identification method • Establish work team (HCV Assessment Team + the management unit's team as the counterpart) and agree upon the work timeline	• Deliver workshop with the company's management unit • Prepare work schedule and allocated supporting facilities and infrastructures to allow good implementation of field survey • Conduct training for the company's management unit	9 August 2017
Participatory mapping	• Clarify potential HCVAs resulted from pre-assessment with relevant stakeholder • Collect additional data/information on the presence of HCV attributes or elements	• Deliver workshop with informants from company staff and employees, and community members who have knowledge on and experience with the Assessment Area	9-15 August 2017
Field survey	• Verify the presence of HCV attributes or elements • Identify HCVAs and map indicative HCVA boundaries	• Check land cover in the field • Collect field data through interview with triangulation method	9-15 August 2017

Phase	Objective	Activity	Time
	• Identify threats and potential threats to HCV		
Stakeholder consultation	• Present the HCV findings/identification to other stakeholders (community, local government and NGO) • Obtain input, additional information and clarification on the presence of HCV attributes or elements, and threats or potential threats to HCV • Obtain input and additional information for making recommendation and options for HCV management and monitoring plan.	• In direct meeting, invite representatives of key stakeholders in the Assessment Area from local community (community leader, traditional leader, religious leader), local government institution (village government, Village Consultative Board/BPD, sub-district government), relevant district-level government agencies (BKSDA, BLHD, Forest and Plantation Office and Animal Farming Office, and interview with NGOs working around the Assessment Area, i.e. Palung Foundation, Ketapang), and other companies operating around the Assessment Area	15 August 2017
Closing meeting	• Present the HCV Assessment's interim output to the Management Unit	• Presentation and discussion • Handover of interim report	16 August 2017
Analysis and reporting	• Present the HCV Assessment in written with format and system that comply with scientific principles, but in a coherent and simple manner to allow the management unit, as the main user of the report, to understand	• Data analysis • Spatial analysis • Report preparation • Report finalisation	20 August – 5 November 2017

2. Methods and Survey Design

In this HCV Study, the guidelines used are: (i) General Guidelines for the Identification of High Conservation Values (Brown *et al*., 2013) which have been updated in September 2017, (ii) HCV Assessment Manual (HCVRN, 2014), (iii) General Guidelines for HCV Management and Monitoring (HCVRN, 2014), (iv) Templates for High Conservation Values Assessment Report (HCVRN, 2014), and (v) Templates for Public Summary of Valuation Assessment Reports High Conservation Value (HCV) Assessor Licensing Scheme (ALS), HCV Resource Network (HCVRN, 2014). Specifically for HCV 3, the guidance used is the Indonesian HCV Toolkit (Consortium for Revision of the Indonesian HCV Toolkit, 2008).

Secondary Data

Data and information collected from secondary data consist of maps of the study area and thematic maps according to the field of study and BPS data. Land cover classification was obtained from two data sources, namely Landsat 8 OLI TIRS satellite imagery acquired on

27 February 2017 on path / row 120/061 (www.earthexplorer.com), as well as 2016 land cover maps produced by the Ministry of Forestry and Environment Life. The roads and rivers are obtained from the Rupa Bumi Indonesia map (BIG, 2017).

To assess HCV 1-3, data collected on Kalimantan's biodiversity such as conservation areas obtained from the Ministry of Environment and Forestry, as well as thematic maps published by institutions or international forums such as Intact Forest Landscape (IFL; www.intactforests.org), Ramsar Site (www.ramsar.org), key biodiversity area (KBA partnership; www.keybiodiversityareas.org), and Important Bird Area - Endemic Bird Area (IBA-EBA; www.datazone.birdlife.org).The list of important species refers to the IUCN Red List of Threatened Species (www.iucnredlist.org) which is also a checklist for field surveys. Several field guides for species identification were also used during the field survey.

To assess HCV 4 data and physical context maps are collected, including watershed boundary maps (KLHK, 2017), Digital Elevation Model 30 meters (USGS, 2000), land systems (RePPProT, 1990), river networks from the Rupa Bumi Indonesia map (BIG, 2017), as well as Landsat satellite imagery. Besides being used for HCV 4 analysis, land system maps are also used to identify the presence of HCV 3. For the social, economic, and cultural context of the community, the information collected includes statistical data from BPS, RBI maps (Rupa Bumi Indonesia), and Landsat satellite imagery. Other information concerning the current socio-cultural situation was collected from various relevant sources.

Primary Data

The emphasis of collecting data and information is aimed at HCV attributes or elements, using a combination of several methods, namely:

Participatory Mapping

This activity is carried out integrated for all types of HCV (biodiversity, environmental services and socio-culture. Resource persons come from the company's staff and employees and community members who have knowledge and experience regarding the study area.The mapping results are then visited and translated into a georeference map.

Ground Truthing and field data collection

This study is a rapid assessment with a focus on collecting data and information aimed at HCV attributes or elements. Field verification focused on areas of potential HCV for each HCV area as follows:

HCV 1; HCV 1 assessment was carried out by means of purposive sampling and sampling areas relating to: (i) habitat quality assessment (combined with the results of flora studies), (ii) direct and indirect observation techniques ((traces, dirt, sounds, hair and nests) and (iii) interviews with local communities with selected sources (eg hunters)

HCV 2; Spatial analysis with GIS techniques and remote sensing was carried out to determine the position of the study area against the IFL area or conservation area or natural ecosystem area in and around the study area. Observations were made on several indicators focused on: i) the existence of natural ecosystems, ii) verification of natural ecosystems in the context of a broader landscape, and iii) verification of the connectivity of potential areas as a link for two or more broad landscapes.

HCV 3; Identification of HCV 3 uses a combination of spatial analysis and ground truthing

methods with Precautionary Approach as presented in the 2008 HCV Toolkit for Indonesia document. Ground truthing is carried out to verify land cover resulting from interpretation of satellite imagery and ensure the presence (or absence) of natural ecosystems in the study area, namely qualitative observations of several proxy indicators or indicators (proxy indicators), such as the stages of succession that occur and the quality or condition of the ecosystem.

HCV 4; HCV 4 field data collection is carried out oriented to the type of study object. Verification is focused on areas of potential HCV (purposive sampling). For each type of object of study, the basic questions that must be answered are the values, functions, and benefits of environmental services such as what is very important and can be given by the object of study. Each object of study found must be equipped with: (i) toponymy; (ii) description of the location (current status such as the type and intensity of utilization); (iii) threats and potential threats; (iv) coordinates; and (v) documentation in the form field photo.

HCV 5 and HCV 6; HCV 5-6 identification was carried out jointly with local communities in three villages in the study area using FPIC principles (FPIC - Free, Prior, and Informed Consent). Collection of HCV 5-6 field data is carried out using purposive interview methods and snowball sampling with the following criteria: (i) communities traditionally utilizing natural resources in the study area; (ii) local communities who have (cultural) interactions with the land or with natural resources in the study area; (iii) history of the use of natural resources by the community.

In-depth interviews with communities in the study area

Information on the presence of HCV attributes and elements was also collected through interviews with selected sources, namely community members, company employees, and key figures who have a lot of knowledge or experience regarding the natural environment in the study area. For this secondary information, a verification or validation process is always carried out through a triangulation process. The number of respondents from surrounding communities interviewed in the field in this study totaled 56 people.

3. Data Analysis and HCV Area Mapping

Spatial analysis includes interpretation and classification of land cover, and mapping of HCV areas is carried out using ArcMap software 10.1. In addition to secondary data such as satellite imagery or land cover maps (KLHK, 2016), the results of the field survey are also used as input in spatial analysis, including ground-thruth coordinates (GPS) and participatory mapping results.

Land Cover Classification

Band merger in this study was conducted on band 6, band 5, and band 3. Specifically for the class of road and river land cover using secondary data from the Rupa Bumi Indonesia map (BIG, 2017). To obtain a final land cover classification, a verification of the initial land cover classification is verified by checking at the observation points determined purposively in the scoping study phase and in the full study. The next step is to compare land cover data from the interpretation of satellite imagery and field verification results

using a contingency matrix. Accuracy testing of results is done using overall accuracy and *kappa accuracy*.

HCV Area Mapping

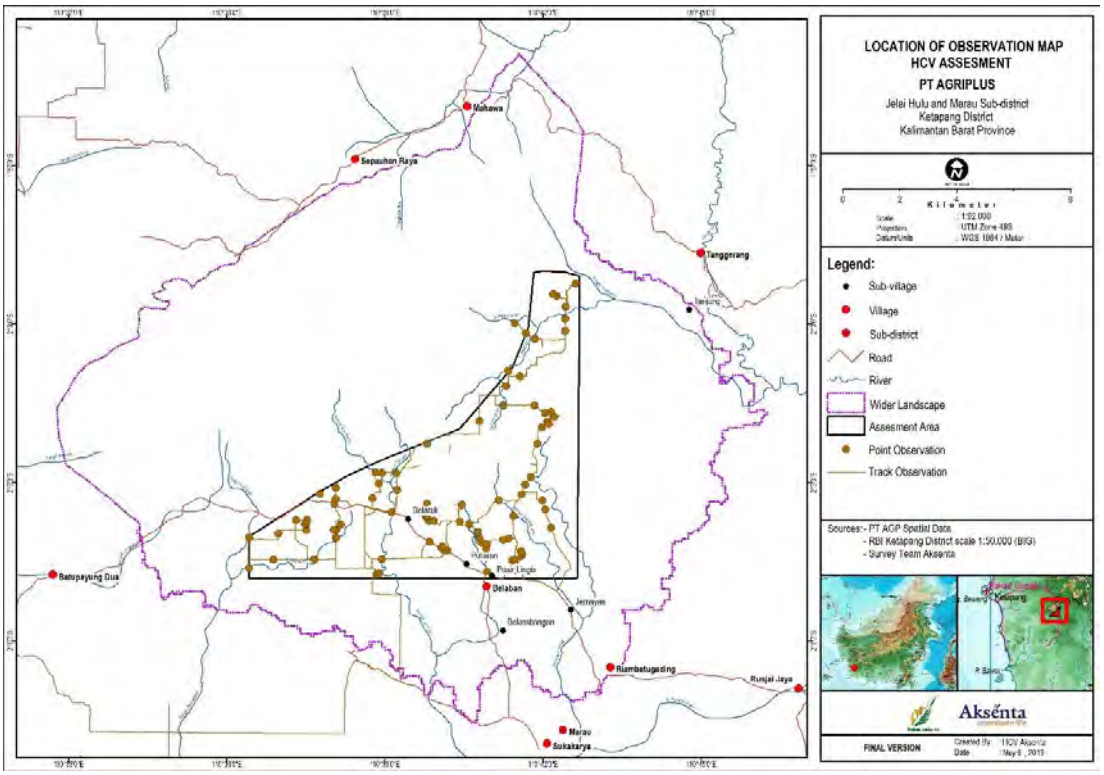
The boundaries of the area with similar field characteristics in the relevant location are then digitized on the work map. From this digitization process, closed polygons will be generated. The boundaries of areas on the map represented by closed polygons are expressed as indicative boundaries of HCV areas. Said to be indicative because these boundaries are based on the results of tracing the area above the map; delineation has not been done yet.

4. Stakeholder Consultation

Consultation with stakeholders is done through informal meetings and formal meetings. This consultation was carried out using the in-depth interview method, participatory mapping, discussion and field visits. The stakeholders involved in the consultation are grouped based on their relationships and interests in the study area and the object being studied.

5. Threat Assessment

The approach used in this threat assessment is the "5-S Framework" and the Participatory Conservation Planning developed by The Nature Conservancy (TNC, 2000). The threat assessment process is used to prioritize HCV management.



Map 4: Observation points and field survey tracks

2.2.4 Land Use Change Analysis

PT Agriplus also conducted Land Use Change Analysis (LUCA) to ensure that there is no deforestation due to land development. LUCA of PT AGRIPLUS was conducted concurrently with HCV Assessment.

This calculation and LUC report was approved by the RSPO on 8 November 2021.

Using the satelite image of Citra Satelit Landsat Citra Satelit Landsat TM 5, ETM+ 7, 8 OLI, Path/Row: 120/61, resolution (30m), the assessment was conducted on some cut-off period refers to the procedure Remediation and Compensation RSPO:

Table 10: Time Series of Satelite Imagery used for LUCA

Period	Date of acquisition	Cloud cover (%)
Before November 1, 2005 (baseline)	1-Jul-04 18-Aug-04	10-20% (haze) 30-40&
1-Nov-05	6-Sep-05 25-Nov-05 3-Dec-05	10-20% 10-20% (stripped) 40-50%
1-Dec-07	28-Sep-07 9-May-08	30-40% 5-10&
1-Jan-10	31-Jul-09 1-Sep-09 23-Jan-10 16-Feb-10	23% 20-30& 20-30% 10-20% (stripped)
9-May-14	24-Apr-14	<5%
Identification of HCV Area	27-Feb-17 11-Jun-17	5-10% 40-50% (stripped)
After the management unit acquired by Bumitama Agri.Ltd (becoming RSPO member)	27-Feb-17 11-Jun-17	5-10% 40-50% (stripped)
Latest satellite image used for ground truthing	27-Feb-17 11-Jun-17	5-10% 40-50% (stripped)
Time of HCV stated satisfactory	Dec-19	
Latest Condition when Verification of NPP	Nov-21	8%

The land cover classification process uses Landsat 8 satellite imagery with an acquisition date of 21 November 2021, this satellite image has 8% cloud cover the MU boundary. A series of pre-processing of satellite imagery is carried out before the land cover classification begins (spectral enhancement: layer stacking and radiometric enhancement: histogram equalization), this process aims to sharpen the hue of each object and produce the desired brightness in the satellite image. The composite bands used in the layer stacking process are bands 4 (red), bands 3 (green), and 2 (blue) resulting in a true color composite with a resolution of 10m on the Sentinel-2 image. The pre-processing of the satellite imagery is carried out using the ERDAS IMAGINE 2014 software. After the pre-processing of the image is complete, the next step is land cover classification.

Land cover classification was carried out by combining object-based image analysis (OBIA) and

visual interpretation methods with manual digitization on Sentinel-2 images. The manual segmentation process and spatial operations were carried out using ArcGIS 10.4 software while the segmentation process with the OBIA approach was carried out using the eCognition Developer 64 software. Manual digitization was performed on polygons that were not successfully segmented in the OBIA process, some of which were manually digitized referring to interpretation key generated based on field findings. Manual land cover segmentation is carried out by considering several key interpretations, namely color, texture, shape, pattern, object size, and associations. The naming of the resulting land cover class refers to SNI 7645-1:2014 concerning Classification of land cover-Part 1: Small and medium scale.

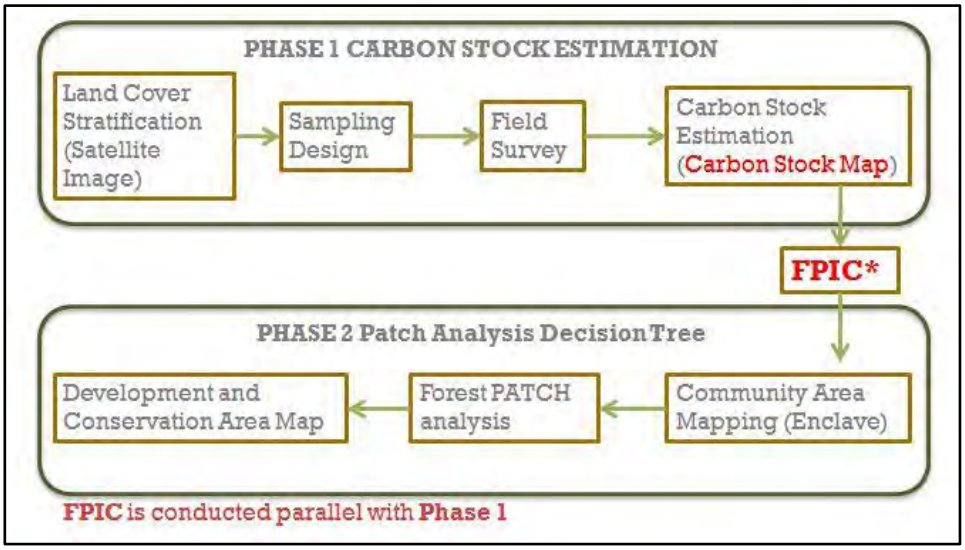
The land cover classification was then corrected using field verification data resulting in corrected land cover, then the accuracy test was carried out again with an overall accuracy value of 83.5% with Kappa 76.7%.

Table 11: Kappa Acuracy

Land Cover		Groundtruthing Result									*User Accuracy (UA)*	*UA (%)*
		Secondary Forest	Old Shrub	Agroforest	Young Shrub	Bush	Bareland	Oil Palm	Total			
Imagery Interpretation Result	Secondary Forest	4							4		1.0	100.0
	Old Shrub		1						1		1.0	100.0
	Agroforest			13	17				30		0.4	43.3
	Young Shrub	2			13				15		0.9	86.7
	Bush					9			9		1.0	100.0
	Bareland						2		2		1.0	100.0
	Oil Palm							54	54		1	100
	Total	6	1	13	30	9	2	54	115		1.0	100.0
Producer Accuracy (PA)		0.7	1.0	1.0	0.4	1.0	1.0	1	*Overall Accuracy (%)=*		83.5	
PA (%)		66.7	100.0	100.0	43.3	100.0	100.0	100	*Kappa Accuracy (%)=*		76.7	

2.2.5 High Carbon Stock

The study was carried out through two phases of work. The first phase covers satellite image analysis and field surveys to produce maps showing potential HCS areas and estimation of carbon stocks in these areas. The second phase focuses on separating areas that are not classified as HCS, patch analysis on the HCS indicative area, and establishing HCS areas to be conserved and non HCS areas that can be developed by the company.



Flowchart 1: Stages and phases of the HCS study process in The HCS Approach Toolkit

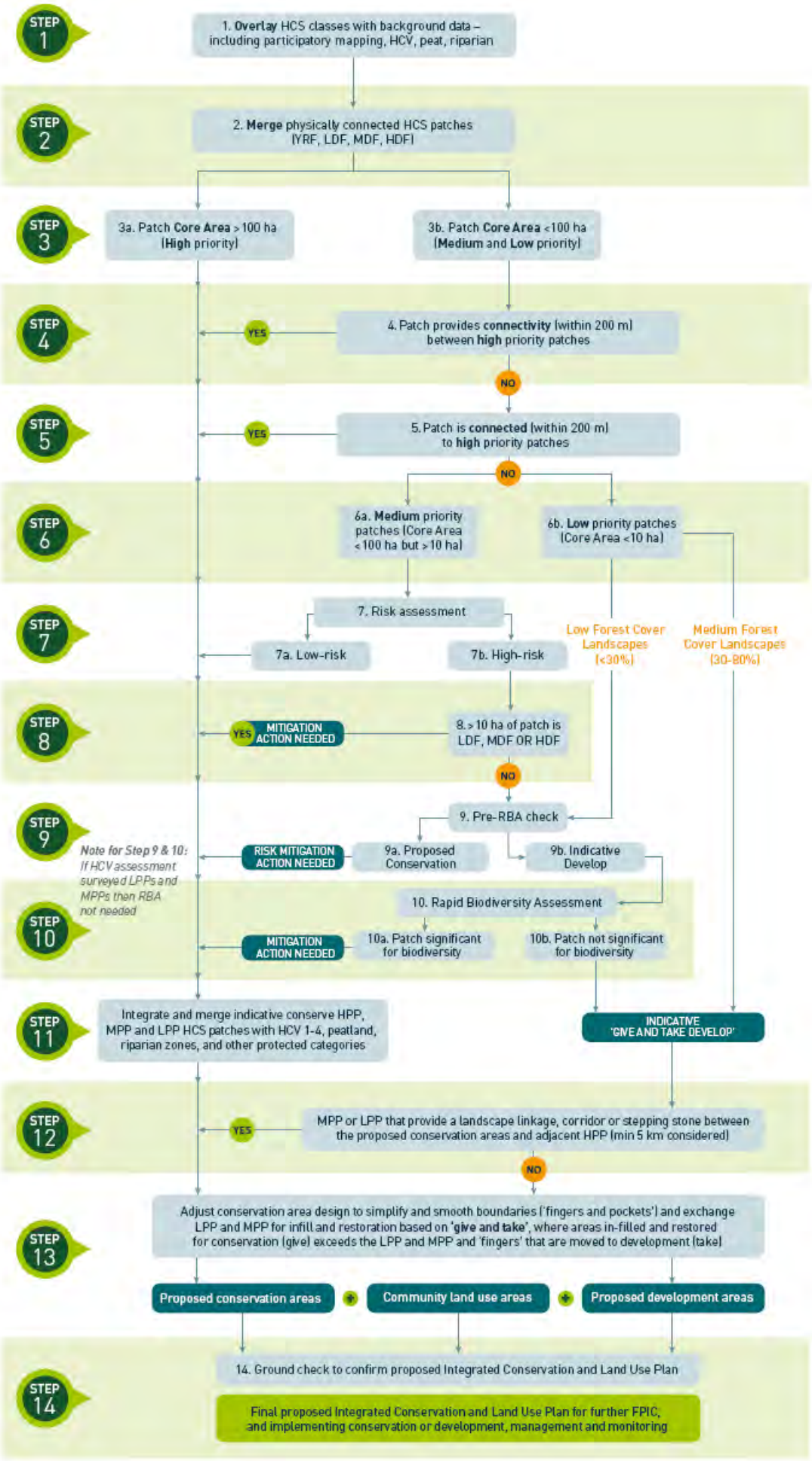
The first phase is the classification stage of land cover types and identifies areas of forest that have the potential to be HCS. The stage of classification of land cover types and determination of the location of samples is carried out through analysis of satellite imagery. This information then becomes a guideline in field data collection to estimate the value of carbon stocks in each class of land cover type.

The second phase is carried out in 3 stages. The first stage to separate areas not included in HCS includes the High Conservation Value (HCV) area, peat ecosystems, river boundaries, and areas that are a source of community income. This process is carried out by participatory mapping. The next stage in this phase is patch analysis of potential HCS areas. This stage will produce areas designated as HCS and non HCS (Potential for Development) areas. Patch analysis is done by following the path of Patch Analysis Decision Tree.

The final stage of this phase is the integration of the HCS area with other conservation areas, and mapping potential areas for oil palm plantation development, taking into account the formation of forest corridors and the compactness of conservation areas.

Data used:

Landsat Satelite Imagery 8 Path 121/Row 61, acquisition date: 27 September 2016. Classification of land cover was carried out by unsupervised classification technique and continued with visual correction of both satellite images.


STEP 1
1. Overlay HCS classes with background data – including participatory mapping, HCV, peat, riparian
STEP 2
2. Merge physically connected HCS patches (YRF, LDF, MDF, HDF)
STEP 3
3a. Patch Core Area >100 ha (High priority)
3b. Patch Core Area <100 ha (Medium and Low priority)
STEP 4
YES
4. Patch provides connectivity (within 200 m) between high priority patches
NO
STEP 5
YES
5. Patch is connected (within 200 m) to high priority patches
NO
STEP 6
6a. Medium priority patches (Core Area <100 ha but >10 ha)
6b. Low priority patches (Core Area <10 ha)
STEP 7
7. Risk assessment
7a. Low-risk
7b. High-risk
Low Forest Cover Landscapes (<30%)
Medium Forest Cover Landscapes (30-80%)
STEP 8
YES
MITIGATION ACTION NEEDED
8. >10 ha of patch is LDF, MDF OR HDF
NO
STEP 9
9. Pre-RBA check
Note for Step 9 & 10: If HCV assessment surveyed LPPs and MPPs then RBA not needed
RISK MITIGATION ACTION NEEDED
9a. Proposed Conservation
9b. Indicative Develop
STEP 10
10. Rapid Biodiversity Assessment
MITIGATION ACTION NEEDED
10a. Patch significant for biodiversity
10b. Patch not significant for biodiversity
STEP 11
Integrate and merge indicative conserve HPP, MPP and LPP HCS patches with HCV 1-4, peatland, riparian zones, and other protected categories
INDICATIVE 'GIVE AND TAKE DEVELOP'
STEP 12
YES
MPP or LPP that provide a landscape linkage, corridor or stepping stone between the proposed conservation areas and adjacent HPP (min 5 km considered)
NO
STEP 13
Adjust conservation area design to simplify and smooth boundaries ('fingers and pockets') and exchange LPP and MPP for infill and restoration based on 'give and take', where areas in-filled and restored for conservation (give) exceeds the LPP and MPP and 'fingers' that are moved to development (take)
Proposed conservation areas
Community land use areas
Proposed development areas
STEP 14
14. Ground check to confirm proposed Integrated Conservation and Land Use Plan
Final proposed Integrated Conservation and Land Use Plan for further FPIC, and implementing conservation or development, management and monitoring

Flowchart 2: HCS Patch Analysis Decision Tree

3. Summary of Assessment Findings

3.1 Social Environment Impact Assessment

The SEIA study the development of oil palm plantation of PT Agrplus in Sub-district of Marau & Jelai Hulu, District of Ketapang, and raises awareness of the environmental impact on the physical-chemical, biological, and social, economic, cultural and local public health; both positive and negative impacts. In the development of plantations of PT Agriplus, one aspect of which is the main consideration is the preservation of the environment, to ensure the development of the plantation is a sustainable development.

Plantation activities had been predicted to impact the environment, so it needs to be explored in depth including the four phases of activities: Pre-Construction Phase, Construction Phase, Operational Phase and Post-Operational Phase. Which each has potential environmental impacts are as follow:

a. Decreasing water quality and aquatic biota
b. Soil destruction and increasing rate of erosion and sedimentation
c. Disruption of air quality & noise level
d. Decreasing number of flora and fauna biodiversity
e. Pests & plant diseases
f. Change of culture, social conflict and community dissatisfaction
g. Job and business opportunities which impact the increment of community income
h. Land fires potential
i. Community health problem
j. Road traffic disruption

Magnitude and importance of the impacts that will be managed and monitored in the Environmental Management Plan and Environmental Monitoring Plan based on the results of the impact evaluation are: 1) Physical-chemical environment components include air quality, surface water quality, and forest fires potential; 2) Social culture and public health components including: social unrest, job and business opportunities, perceptions, local revenue and public health level.

Environmental management of the environmental components that are experiencing fundamental changes, both positive and negative will be using three approaches, and they are: technological, socio-economic-cultural and institutional and this environment management plan is to form part of the Oil Palm Development plan of PT Agriplus.

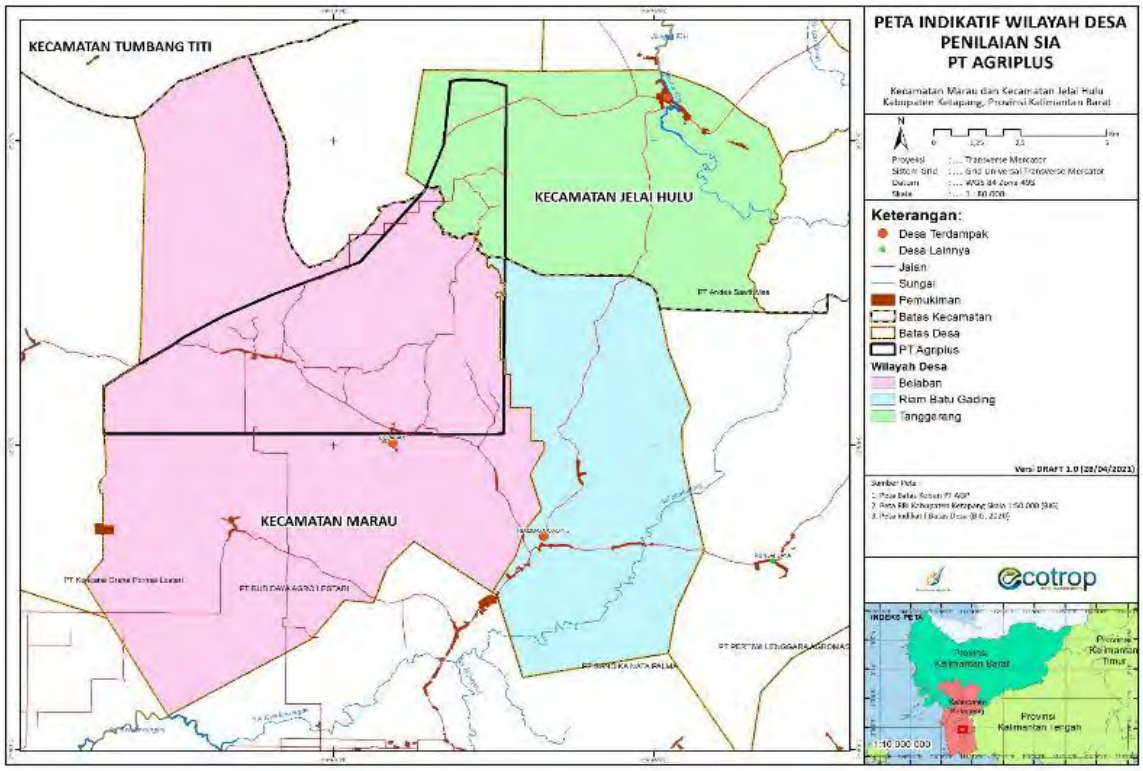
The implementation of environmental monitoring will be carried out by PT Agriplus. Besides the periodic review by the management, the environmental monitoring reports will also be submitted annually to the technical adviser of the government agencies.

3.2 Social Impact Assessment

Administratively, the area of PT Agriplus is located in the Village of Belaban and Riam Batu Gading, Sub-district of Marau, and Village of Tangerang, Sub-district of Jelai Hulu, District of Ketapang, West Kalimantan Province.

Sub-district of Marau is in 1°53’12” S - 2°29’36” S and 110°24’48” E - 110°47’12” E, with area 1,160 km^2 or 3.67% from the total of district area, which is the tenth largest district in Ketapang. Meanwhile,

Sub-district of Jelai Hulu is in 1°46'00" S - 2°08'24" S and 110°36'12" E - 110°01'36" E, with area 1,358 km^2.



Map 5: PT Agriplus location within village boundaries

Table 12: Villages Area and Population in the Study Area

Sub-district	Village	Hamlet	Population		Total Population	Density (People/Km^2)	Householder
			Male	Female			
Marau	Belaban	Belambangan	1,483	1,282	2,765	18	880
		Putaran					
		Pasir Lingis					
		Belatuk					
		Jumayas					
	Riam Batu Gading	Penyiuran	1,012	936	1,948	34	629
		Riam Kusik					
		Batu Perak					
Jelai Hulu	Tanggerang	Tanjung 1	878	810	1,688	28	576
		Tanjung 2					
Total			3,373	3.028	6,401	80	2,085
Average			1,124	1.009	2,134	27	695

Source: Data Kependudukan Kabupaten Ketapang (Dinas Kependudukan dan Pencatatan Sipil Kabupaten Ketapang, 2020)

Belaban, Sub-district of Marau

The Majority of the local population is Dayak (95%), the rest are Javanese and Malay (5%). The population based on their religion is dominated by Catholics: 1,205 people (50%), Protestant Christians: 1,086 people (45%) and Islam: 121 people (5%).

In general, surrounding peoples work in companies around their place of residence as their main livelihood (66%), then 33% are farmers, especially rubber farmers, the rest are craftsmen and civil servants / honorariums. Local community rubber planting patterns are usually not neatly, this is added to because the selling price of rubber is low so that many farmers pay less attention to maintenance.

In Belaban village, there are only kindergarten and elementary school buildings. There are 2 kindergartens equipped with 4 teaching staff. Meanwhile, there are 4 elementary school buildings with 24 teachers. To continue to the next level of education, people have to go to another village nearby. Belaban Village has sports facilities that can be used by the general public.

For health care facilities, Belaban Village has 2 Public Health Center (Puskesmas) and 3 Posyandu. In the village, there is only 1 midwife as a medical staff, and one "trained birth attendant". For treatment of certain diseases and hospitalization is required, referrals are usually directed to the Marau Sub-District Health Center.

Riam Batu Gading, Sub-district of Marau

It is an expansion village from Suka Karya Village as its parent village, with the coverage of the hamlet covering Penyiuran Hamlet, Batu Perak Hamlet and Riam Kusik Hamlet.

Generally, The livelihood of the population as farmers (80%) by cultivating rubber, oil palm and food crops. The rest have a livelihood as traders and plantation company employees as well as civil servant / honorary employees.

60% of the residents of Riam Batu Gading Village are Catholic, 35% are Protestants and the rest are Muslim.

In this village, educational facilities are available up to the SD level. If the peoples intend to continue their education at the next level (Junior and Senior High School), they usually head to the closest villages such as Runjai Jaya Village, Randai Village and Suka Karya Village.

Tanggerang, Sub-district of Jelahi Hulu

The Dayak Jelai tribe is the dominant tribe in Tenggerang Village (90%), while the rest is the distribution of the Javanese, Chinese and Malay ethnic groups (10%). As for the religion followed by the population of Tanggerang, the majority are Catholic as : 90%, the rest are followers of Protestant Christianity and Islam: 10%.

Generally, the people of Tanggerang Village make their living by working for plantation companies. The rest have livelihoods as rubber farmers, oil palm farmers, food crop farming, traders, civil servants, farm laborers and agricultural product collectors.

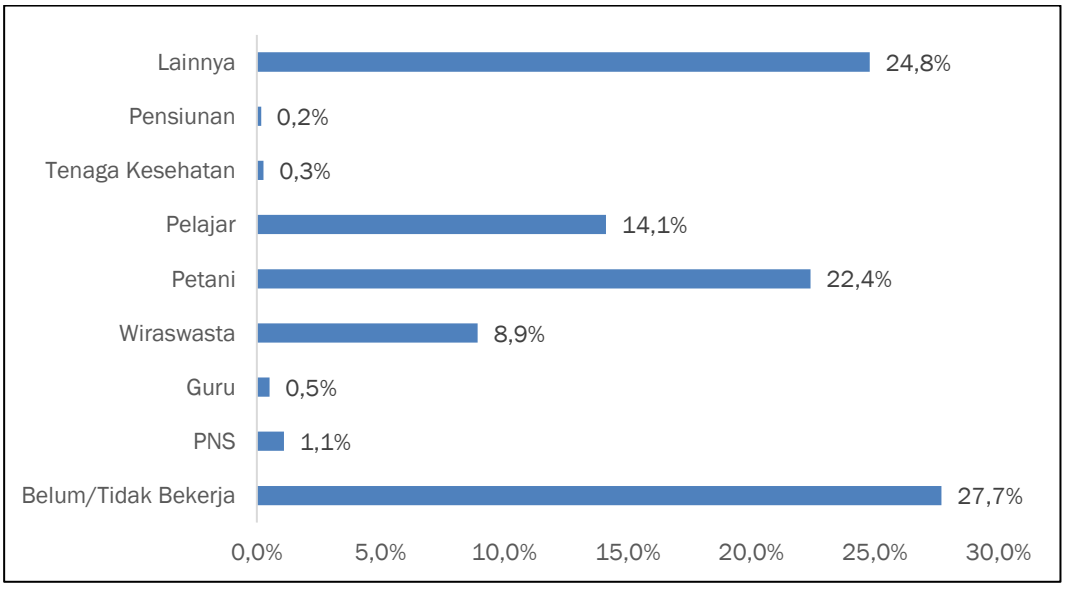
Not much different from the other two villages around Agriplus, this village has 1 kindergarten and 3 elementary school buildings. And if the peoples want to continue to the next level (Junior and Senior High School) it is in Teluk Rinjai Village which is not far from Tanggerang Village.

Socio-Economic

The three villages at the assessment site have a long history as centers of rubber production by the community. However, after the rubber commodity price decreased since 2010, the majority of people started to cultivate oil palm as a leading agricultural commodity.

The socio-economic characteristics of the communities in the assessment locations are relatively the same, where most of the people depend on the agricultural sector and work as employees/laborers in several companies. According to data from the Population and Civil Registration Office of Ketapang Regency, 2020 for all ages, the types of work occupied by the community at the assessment location are 24.8% other, farmers 22.4%, self-employed 8.9%, Civil Servants by 1.1%, teachers by 0.50%, health workers by 0.3%, and retirees by 0.2%. In addition, there are 27.7% of people who have not/not worked and 14.4% of students. The following are types of community work at the assessment site.

Graphic 1: percentage of types of work



Source: Data Kependudukan Kabupaten Ketapang
(Dinas Kependudukan dan Pencatatan Sipil Kabupaten Ketapang, 2020), – catatan, seluruh usia.

Health Care and Clean Water Source

Health care facilitation is not optimally available in all villages in the study area, although there are one Public Health Center (Puskesmas) in each sub-district, with a very limited number of medical personnel. There is only one doctor in each subdistrict, assisted by 10 midwives in Marau District and 14 people in Jelai Hulu. There are more nurses, 23 people in Marau District and 17 people in Jelai Hulu District. Midwives, nurses, traditional birth attendants, and active cadres of Posyandu.

An ambulance unit is available at the Main Puskesmas which can be used at any time to evacuate patients who need to be referred from the Pustu to the Main Puskesmas or to the Hospital in Ketapang Regency.

People generally get clean water from dug wells, rivers and springs. Water from wells is usually pulled up into the torn (reservoir) using electricity or a generator, then for water that comes from springs, the community conducts storage upstream of the spring which is then channeled to houses using pipes.

Energy (Electricity) Source

The electricity network has entered the three study villages, both connected to the PLN Marau sub-district and the Jelai Hulu sub-district. Electricity began to enter the three study villages around 2013 using a token payment system.

The fuel requirement for household cooking generally uses 5 kilograms of LPG. However, there are still some residents who still use firewood for the reason that it is more economical because the availability of firewood is very much.

Transportation and Communication

The villages in the study area have a land road network, some of which are dirt roads and others have asphalt roads, although later found asphalt roads that have begun to deteriorate. The entire village road network is directly connected to the provincial road network to regency cities. Four-wheeled vehicles are available for rent, especially for long-distance purposes. For everyday purposes, with a distance that is not too far away, people choose to use two-wheeled vehicles / motorbikes.

Several sections of road infrastructure have been opened by the company and can be used by the public, especially those connected to oil palm plantations, even though they are still in the form of land / have not been paved.

Communication network services have covered almost all corners of the village in the study area because they are supported by the existence of several towers, especially from providers Telkomsel and Indosat. However, there are still some blank spot areas where no signal is obtained from the two providers.

Positive Social Impact

i. Improvement of local and regional economy. It is a direct impact of operational activities because it is related to increasing people's purchasing capacity. Some of PT Agriplus's activities that have a direct impact on local and regional economic improvement are: (1) Additional income for community due to Partnership/ plasma development program 20% of the core plantation development; (2) the contribution of household necessities expenditure of PT Agriplus workers (employees and staff) to business actors at the local level, this impact is very significant for the people of Suka Karya, Riam Batu Gading, and Tanggerang Villages; (3) A cooperation contract between PT Agriplus with local entrepreneurs for operational purposes such as transportation

of FFB transportation and sales of FFB; (4) Taxes and levies paid by PT Agriplus to the government.

ii. The openness of accessibility, the roads built and maintained by PT Agriplus have a very significant direct impact on the community in terms of accessibility. The maintenance of village/district/provincial roads carried out by PT Agriplus provides direct benefits for the village community. In addition, rural communities can also use company roads as access to their agricultural land.

iii. Absorption of labor, some peoples in the surrounding villages work at PT Agriplus. PT Agriplus contributes to alternative types of work for communities in village. More than 90% workers at PT Agriplus are local people. The majority of these communities work in the fields of maintenance, harvesting, security and administration.

iv. Social responsibility program, the presence of PT Agriplus has a direct impact on the social community through various assistance programs. Community representatives at the assessment site stated that PT AGP contributed to various sectors to improve community welfare.

Negative Social Impact

i. River pollution. On the interview session, community representatives stated that the intended river pollution was the result of the use of agrochemicals. However, the pollution is not only from PT Agriplus, but is the accumulation of various plantation activities carried out by the companies and the community itself.

ii. Air pollution. The company's operational activities, especially the transportation of FFB, contribute to air pollution, namely the effect of dust generated. However, the air pollution is an accumulation of various transportation activities carried out by the company and the community, especially those that pass through the road around the village.

iii. Damage to roads. PT Agriplus's operational activities, especially the transportation of FFB, contributed to the damage to inter-district and provincial roads. However, the road damage is an accumulation of various transportation activities carried out by the company and the community.

Worker's Rights and Condition

The PT Agriplus worker community is a community that is exist due to the operational activities of PT Agriplus (emerging community). Some of these communities are local people and some are immigrants. This community has a special pattern of relationships and impacts from the company's activities, so it is important to conduct special consultations with these communities to identify social problems, social impacts, and expectations from the presence of PT Agriplus.

Based on the results of consultations with representatives workers, there were no discrimination against workers, no underage workers were found, the company has fulfilled the rights of its employees. Some important facilities for employees have been provided by the company such as housing facilities, water, electricity, places of worship, educational infrastructure (schools), and other facilities, but the number is still limited. The company is currently in the stage of building important facilities for employees such as housing, clean water installations, houses of worship, educational infrastructure, and other public facilities.

Table 13: Summary results of consultations with workers' representatives

Source Person	Main Concern
M. Riyandi	• There is only Permanent Employees at PT Agriplus, no casual daily employees were found; • The rights of employees have been fulfilled by the company. Employee wages refer to the Ketapang District's Minimum Wage, which is IDR 2,880,000 for 2021. Employees are facilitated by BPJS insurance; • Workers who are absent without permission are not paid their daily salary, but if there is official permission, they will still be paid; • Workers have the opportunity to get a premium paid if they have worked more than the base. It usually happens to harvest workers on a yield basis. They will get another IDR 15,000/ hour. This excess premium is paid in the following month. However, there is maximum premium paid that can be inputted, and it has been socialized to workers; • People who work with chemicals get an extra food every day (milk); • There are shuttle facilities for workers.
Tomi	• Workers are facilitated with Personal Protective Equipment (PPE) which is renewed once a year, or according to the lifetime of the related PPE. If the PPE is broken before the replacement period, the workers can report this to the foreman or assistant, to be replaced with a new one; • There is a warning for employees who fail to use PPE, if the warning is repeated it will be subject to sanctions. this has been socialized to the workers.
Analia, Rafita	• The company provides housing facilities for workers, although it is not sufficient for all employees. Some employees now choose to live in the village, especially if it is close to their workplace; • Gender committees and trade unions have not been formed; • Child care facilities for workers are not yet available; • Workers really hope that health insurance for their families (children) can be borne by the company.
Yunita	• Workers are not disciplined about working hours. Regulations regarding working hours must be better and stricter, control mechanisms should be clarified; • The previous management has a good relation with the communities, for example by attending traditional events in the village, such as deaths and weddings. This good relationship can be fostered by the current Agriplus management.

Social risk analysis

Table 14: Social Risk Analysis

Risk	Reason	Result	Control	Possibililty	Impact	Risk Value
High public expectations of the company	• There is no transparency of job vacancy information to the public; • There is no discussion and agreement regarding the allocation of Tanah Kas Desa (TKD) between the company and the community.	Community disappointment with the company and the potential for open conflict	<80%	3	3	9
Negative Company Image	• The company's response to public complaints is relatively slow; • River pollution from the use of agrochemicals;	The decline in the relationship between the community and the company	<80%	3	3	9

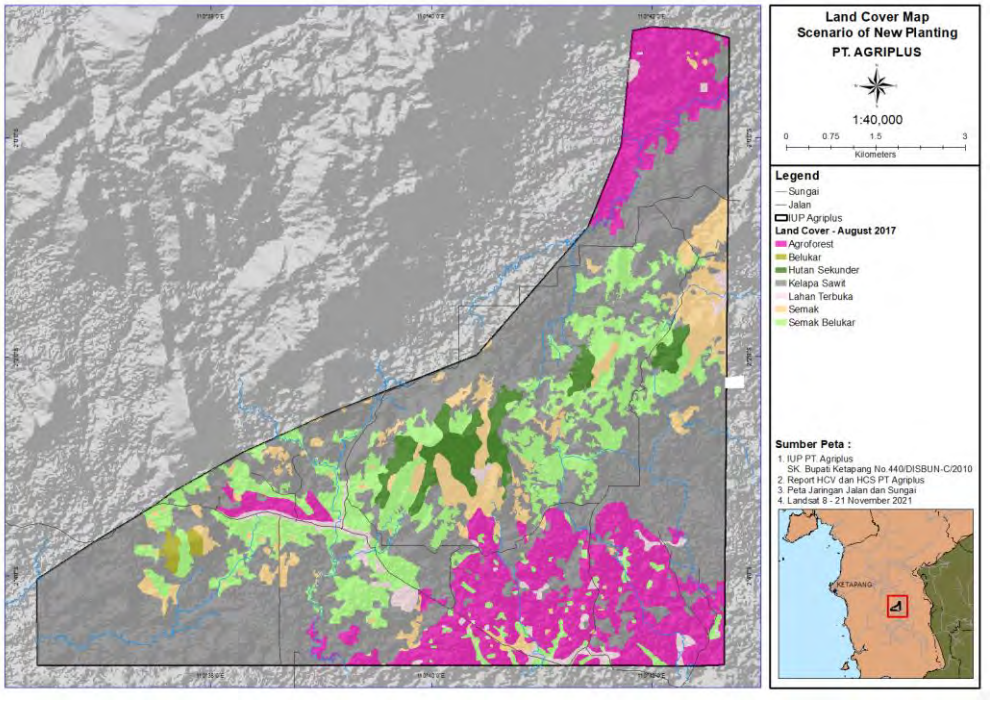
Risk	Reason	Result	Control	Possibililty	Impact	Risk Value
	• Air pollution, impacts from the use of provincial/district roads by companies for the transportation of FFB.					
Corporate Sustainability	Decreased level of public trust in the company	Not achieving the company's production target	80%-99%	3	2	6

Note:	High:		Middle:		Low:	

3.3 HCV assessments

PT Agriplus is located in the Kendawangan (76%) and Jelai (24%) watershed. Based on its position towards the watershed boundary, the study area is located in the upstream part, so that the presence of water catchment areas (hills) or rivers in this area has an important role in the hydrological context of the area.

The climate in the study area is a tropical climate belonging to the Am type (Koppen, 1900 in Kottek et al., 2006). This means that the study area experiences a short dry season, but the annual rainfall is high enough that the soil is relatively moist. The average annual rainfall is 2,410 mm / year with rainfall that is almost evenly distributed throughout the year. The dry season occurs in July-September, although the rainfall (CH) in that period is still classified as a humid month (CH 60-80 mm). Meanwhile, other months have rainfall> 100 mm or are included in the wet month category. With these climatic conditions, naturally, the vegetation cover in this region is tropical rain forest.



Map 6: PT Agriplus on the Map of Land Cover, at the time of HCV Assessment

3.3.1 Regional and National Context

The study is in the Kalimantan island landscape which has several types of tropical habitats that are rich in biodiversity. As an illustration, on the island of Borneo there are 225 species of terrestrial mammals with 44 species of which are endemic (Payne *et al*., 2000); 639 bird species, with 358 species including settlers and 37 endemic species (MacKinnon *et al*., 2000), 166 species of snakes (Stuebing, 1991), between 140-150 species of amphibians (Inger & Stuebing, 1997), 394 species of aquatic fish tasteless with 149 endemic species (MacKinnon *et al*., 1996). Some unique animal species inhabit this island, namely Borneo Orangutan (*Pongo pygmaeus*), Proboscis Monkey (*Nasalis larvatus*), Sun Bear (*Helarctos malayanus*), Clouded Leopard (*Neofelis diardi*), Bornean Bay Cat (*Pardofelis badia*), White-shouldered Ibis (*Pseudibis davisoni*), Storm's Stork (*Ciconia stormi*) and Bulwer's Pheasant (*Lophura bulweri*).

Based on the distribution of plant species, of the 267 species of Dipterocarpaceae, 155 of them are endemic to Kalimantan, thus making the island of Borneo the center of the world's diversity of *Dipterocarpa*. On the island of Borneo there are several types of flora that are endangered and protected by Indonesian laws and regulations, mainly trees from the *Dipterocarpaceae* family (*Shorea spp*., *Vatica spp*.). In addition, there are several other important flora species which are protected by the Indonesian government based on Minister of Agriculture Decree No. 54/Kpts/ Um-2/1972 and Minister of Forestry Decree No.261/Kpts-IV/1990, such as jelutung (*Diera costulata*) and benggeris (*Koompassia excelsa*), as well as various species of semar sacs (*Nephentes spp*.).

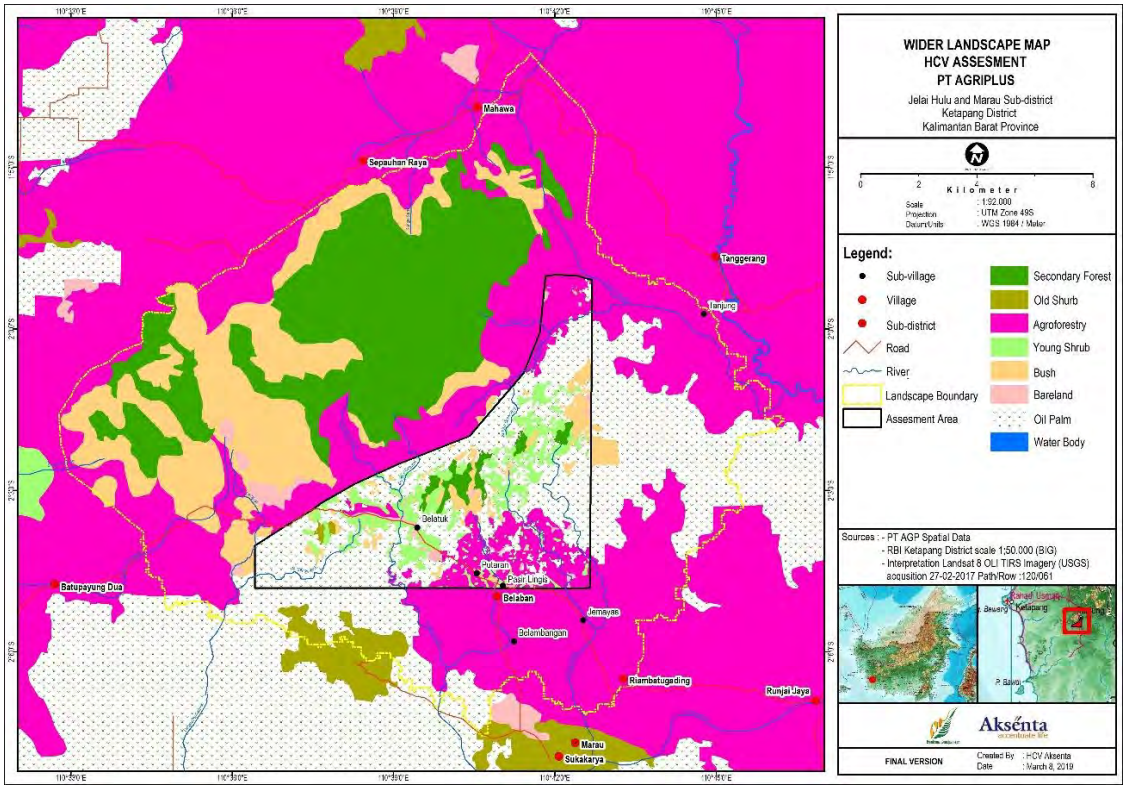
Key areas for biodiversity, or key biodiversity areas, can be broadly defined, but several international organizations have identified key areas for biodiversity with their respective criteria. The key areas that are internationally recognized are:

1. **Important Bird and Biodiversity Areas (IBA)**;); Important areas for bird species as well as for nearby conservation are Mount Palung ID 047, which also includes EBA 157 "Bornean Mountains" (Kalimantan mountains; ± 100 km to the north), and IBA in Muara Kendawangan which is ± 65 km away (Holmes *et al*. , 2001).
2. **Endemic Bird Areas (EBA)**; Kalimantan Mountains, or "Bornean Mountains" number 157. This EBA covers mountains in the interior of Borneo, and is the largest EBA in the Greater Sunda Islands region.
3. **Ecoregions**; Around the study area there are five types of ecoregions, namely: Borneo Lowland Forests, Bornean Peat Swamp Forests, Southwest Borneo Freshwater Swamp Forests, Sundaland Heath Forests, and Sunda Shelf Mangroves. The study area is in the area of the Borneo Lowland Rain Forest. However, the study area is not included in the Intact Forest Landscape area.
4. **Ramsar Site**; Ramsar Site; in Kalimantan there are only two Ramsar Sites which are located very far from the study area, namely Danau Sentarum National Park (± 330 km to the northeast) and Tanjung Putting National Park (± 250 km to the southeast).
5. **The Heart of Borneo (HoB)**; the study area is not in the HoB area. The closest distance to this area is ± 200 km to the northeast.

The economic sector that dominated the contribution to the income of Ketapang Regency mainly came from the agriculture sector, which accounted for 83.9% (BPS, 2016). The agriculture sub-sector itself is dominated by the plantation sub-sector, which in 2015 reached 62.89%. In the same year, other sectors that were classified as large were forestry and logging (9.56%), and livestock (9.21%).

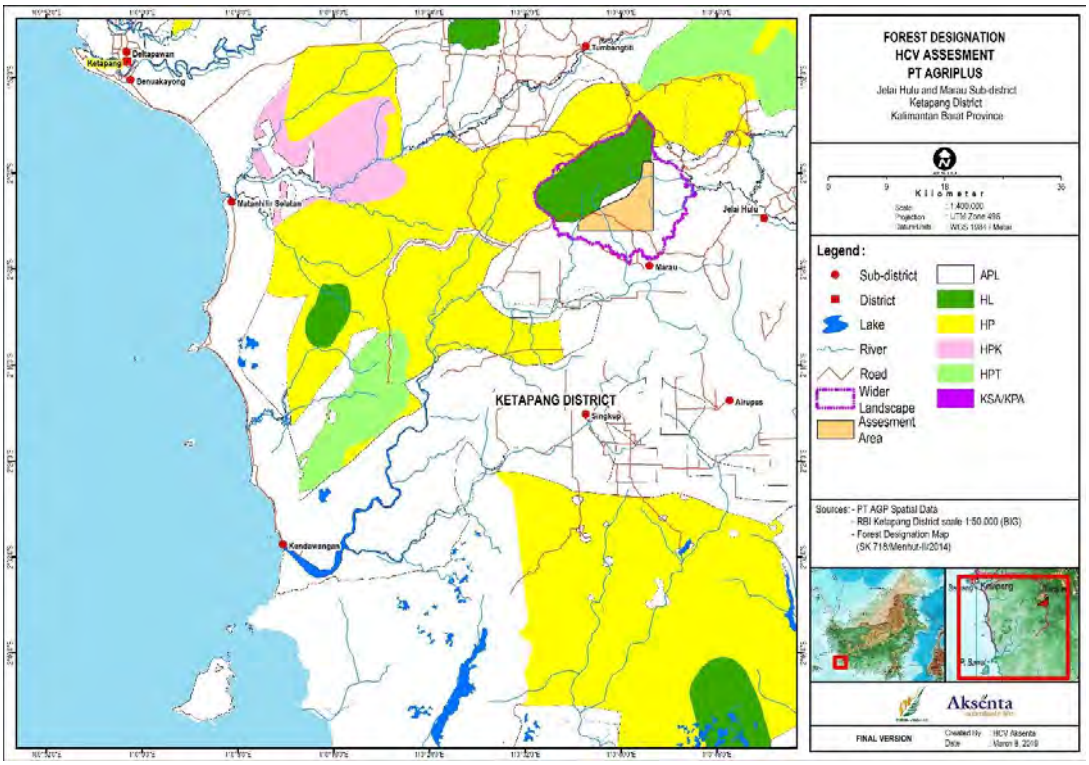
3.3.2 Landscape Context

The broader landscape context (AOI) are obtained from the aggregation of the biodiversity, hydrological, and social landscape boundaries. The boundaries of the biodiversity assessment landscape are determined based on the existence of natural ecosystems and/ or locations that have potential as wildlife habitats, especially areas that have connectivity with study area. The landscape boundaries of the hydrology are determined based on the sub-watershed boundaries. The boundaries of the social assessment landscape are determined based on administrative boundaries or radius boundaries with the closest village/settlement. Based on these criteria, the landscape boundary of this study covers 31,892.5 ha which also includes the Gunung Raya Protected Forest Area to the north of the study area (Map 7).



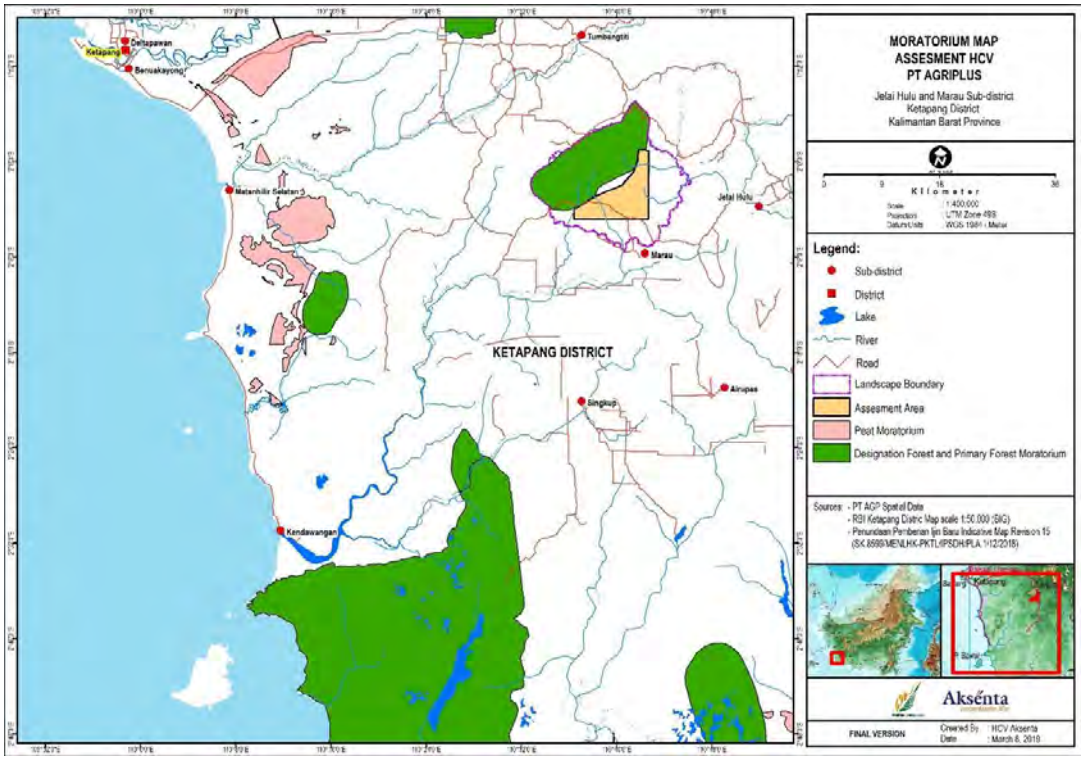
Map 7: The boundaries of the study area in the wider landscape

The entire area of the company based on PT AGRIPLUS's Location Permit (issued August 5, 2010) and PT AGRIPLUS's IUP (issued August 6, 2010) are in Other Use Areas (APL) based on the Decree. Minister of Forestry No. SK.936 / Menhut-II / 2013 concerning Map of Changes in Designation, Function and Designation of Forest Areas. However, after SK 733 / Menhut / 2014 was issued, there was a small area that overlapped the Gunung Raya Protection Forest area to the north and west. The APL area around the study area has generally become an oil palm plantation, both managed by the company or by individuals or farmer groups (Map 8).

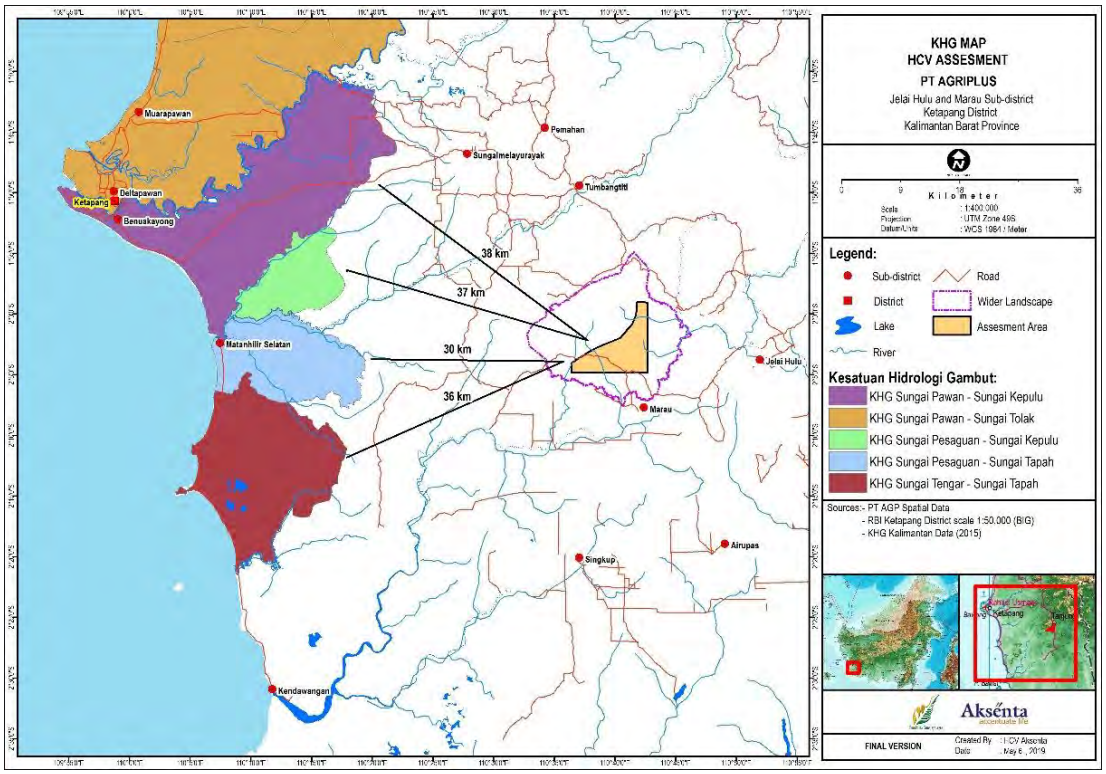


Map 8: Study area projected on Land Status and Land Use Map

Based on the Indicative Map of the Delay in Granting a New Location Permit (PIPPIB) for revision XI in 2017 (Map 9), there are some areas that overlap with the moratorium area. The area is located in the northern part of the study area, namely the HL Gunung Raya area. While the Peat Hydrology Unit (KHG) does not exist in the study area and its surroundings (30-40 km to the west: Map 10).

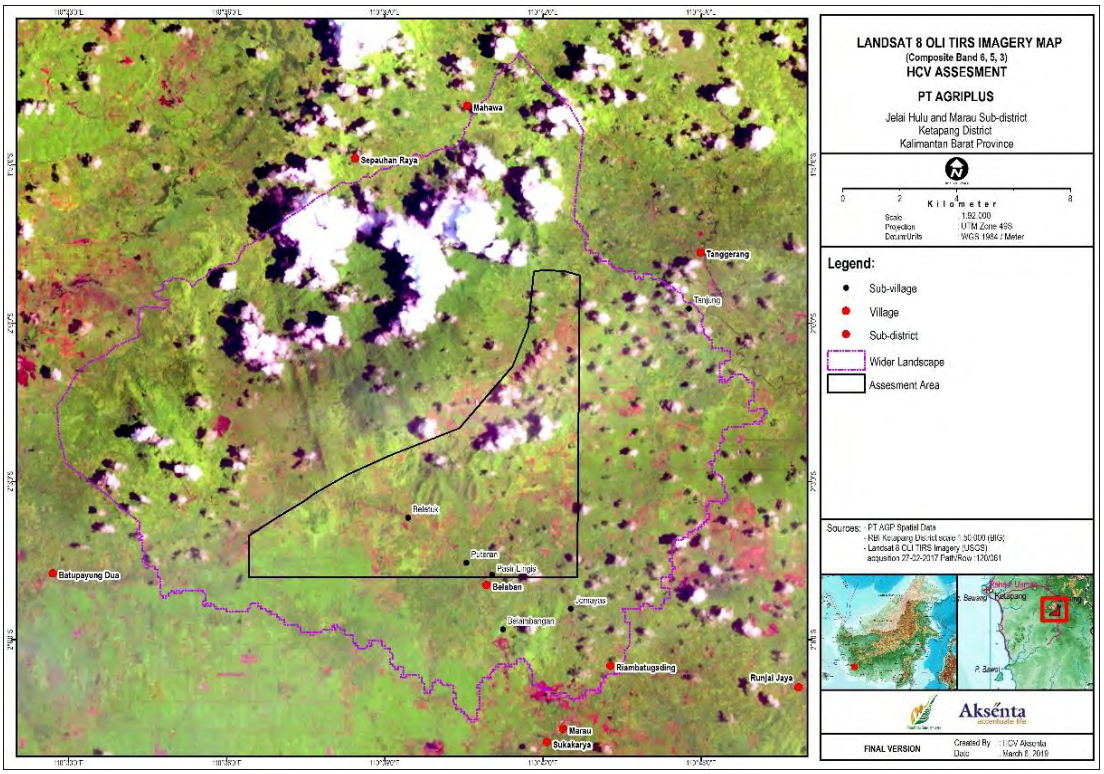


Map 9: Study area projected on the Revision XI PIPPIB Map of 2017

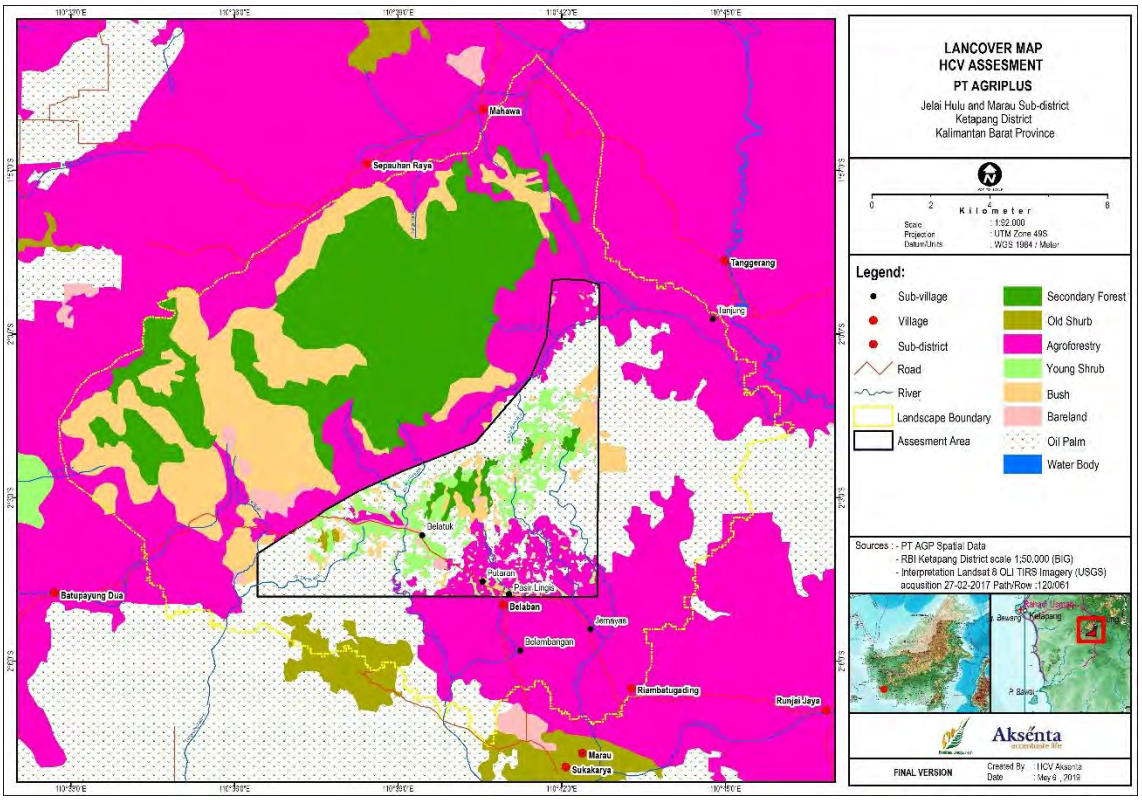


Map 10: Study area projected on the Peat Hydrology Area Map (*Kawasan Hidrologi Gambut*)

Based on the analysis of Landsat satellite imagery on 27 February 2017 (Map 11 and Map 12) there are seven types of land cover in the study area with agroforest and oil palm cover dominance. Agroforest, oil palm, and bush land cover types also dominate the landscape. However, in the study landscape (AOI) there is still a forest cover covering an area of 6,304.2 which is located in the Gunung Raya Protection Forest area to the north of the study area.



Map 11: Landsat imagery showing land cover in the landscape of the study area



Map 12: Land cover in the study area and surrounding areas (AOI)

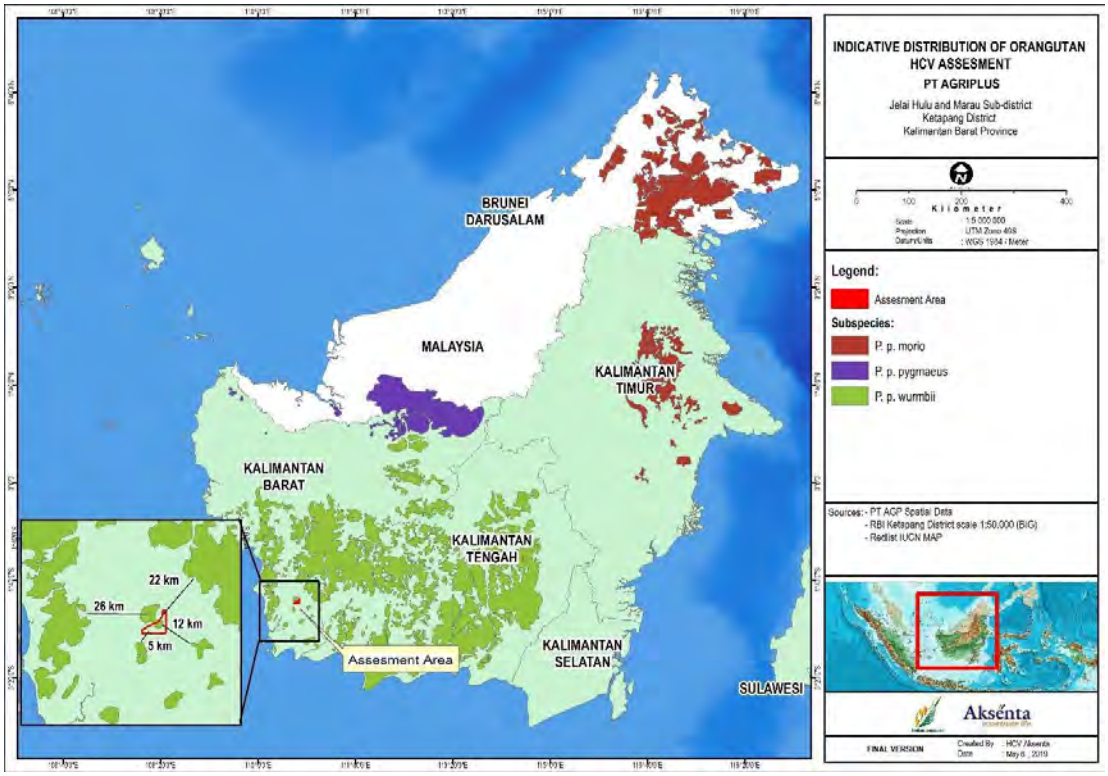
3.3.3 Biodiversity Context

This area is far from areas that are usually places for biodiversity research, such as conservation areas or places considered to have high levels of biodiversity. Therefore, specific information about biodiversity in the study area is very limited. However, referring to the position of the study area which is located in the lowlands, then information on relevant biodiversity can refer to a protected area that is relatively one stretch, namely the Gunung Raya Protected Forest (HL) which a small part of the area overlaps with the study area.

Based on the research of Harahap *et al*. (2015), HL Gunung Raya is dominated by the Dipterocarpaceae family. The largest potential of stands is dominated by Meranti Merah (Shorea leprosula) 183,77 m^3 and the smallest volume of Keranji (Dialium indum) 6.14 m^3. The types of IUCN status recorded in HL Gunung Raya are *Eusideroxylon zwageri* (EN), *Dipterocarpus borneensis* (NT), *Shorea acuminatissima* (CR), *Shorea leprosula* (NT), *Shorea bracteolata* (EN), *Brugmani syndrome*, and *Dyera Lowii*. For the types of fauna found in HL Gunung Raya, literature has not been found to support this study, but based on the composition of the natural stands it is estimated that the area has a relatively higher diversity of animals compared to the study area. It is estimated that the HL region can become a migration corridor for animals that are able to support top predators or species that have quite extensive home ranges such as orangutans and sun bears to live and breed. According to the IUCN global map for the distribution of rare and threatened species, the study area includes the distribution of Bornean Orangutan (*Pongo pygmaeus*), Proboscis Monkey (*Nasalis larvatus*), Agile Gibbon (*Hylobates albibarbis*), Sunda Pangolin (Manis javanica), Flat-headed

Cat (*Prionailurus planiceps*), Spiny Turtle (*Heosemys spinosa*), Giant River Tortoise (*Orlitia borneensis*), False Gharial (*Tomistoma schlegelii*).

Kalimantan's charismatic primate species, namely orangutans, are known to be concentrated in only a few regions of Kalimantan. This charismatic primate habitat spreads in primary tropical rain forests, secondary tropical rain forests, and is often found in Dipterocarpa lowland forests, freshwater swamp forests and peat swamp forests. Orangutans are also recorded on plains with altitudes up to 1,500 meters above sea level, although the number of encounters in areas with this height is not significant (MacKinnon, 1974; Rijksen, 1978; Payne, 1988; Payne and Andau, 1989; Rijksen and Meijaard, 1999). The reduced area of orangutan habitat or hunting has drastically reduced the population of these primates, so the existence of orangutans is now classified as Critically Endangered. The distribution of the Bornean Orangutan sub-species has been mapped by Banes (2016), and on the map the study area is in the distribution of P. pygmaeus wrumbi. However, the orangutan distribution map accumulates secondary data and information, not all of the results and still require field verification.



Map 13: Study area projected on the distribution map of Bornean Orangutan

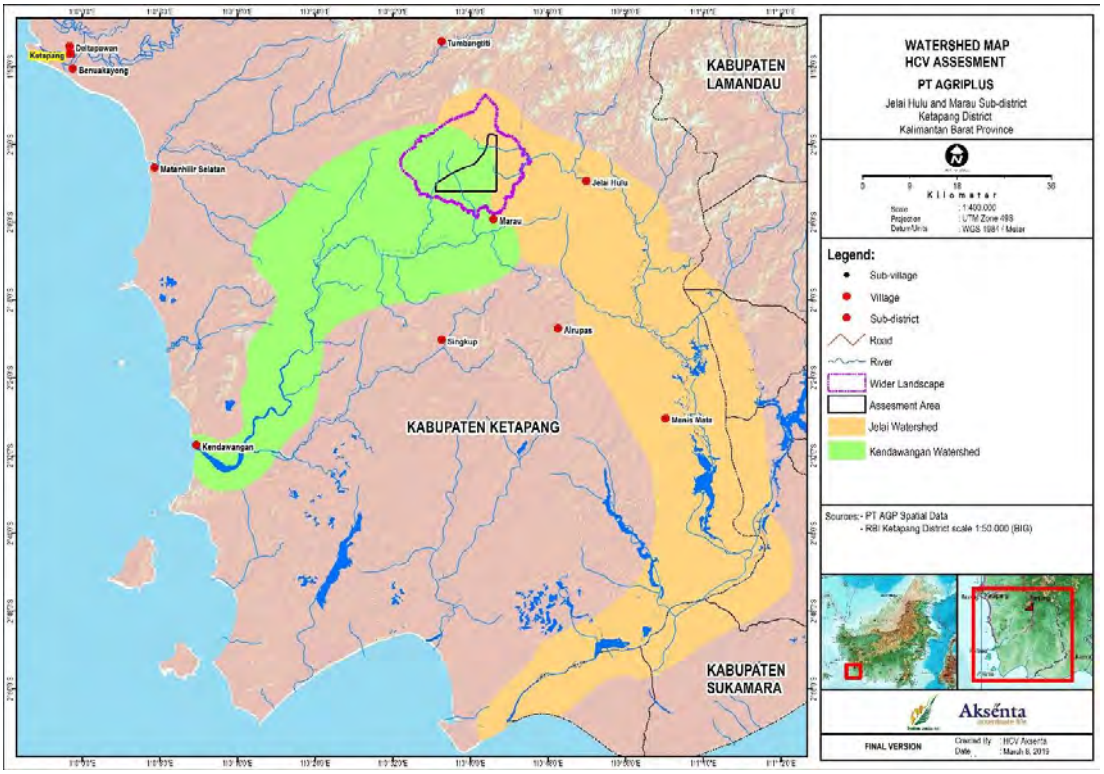
3.3.4 Context of Physical Environment

Climate in the study area is a tropical climate that belongs to the type of Am (Koppen, 1900 in Kottek *et al.*, 2006). This means that the study area experiences a short dry season period, but the annual rainfall is high enough so that the soil is relatively moist. The average annual rainfall is 2,410 mm / year.

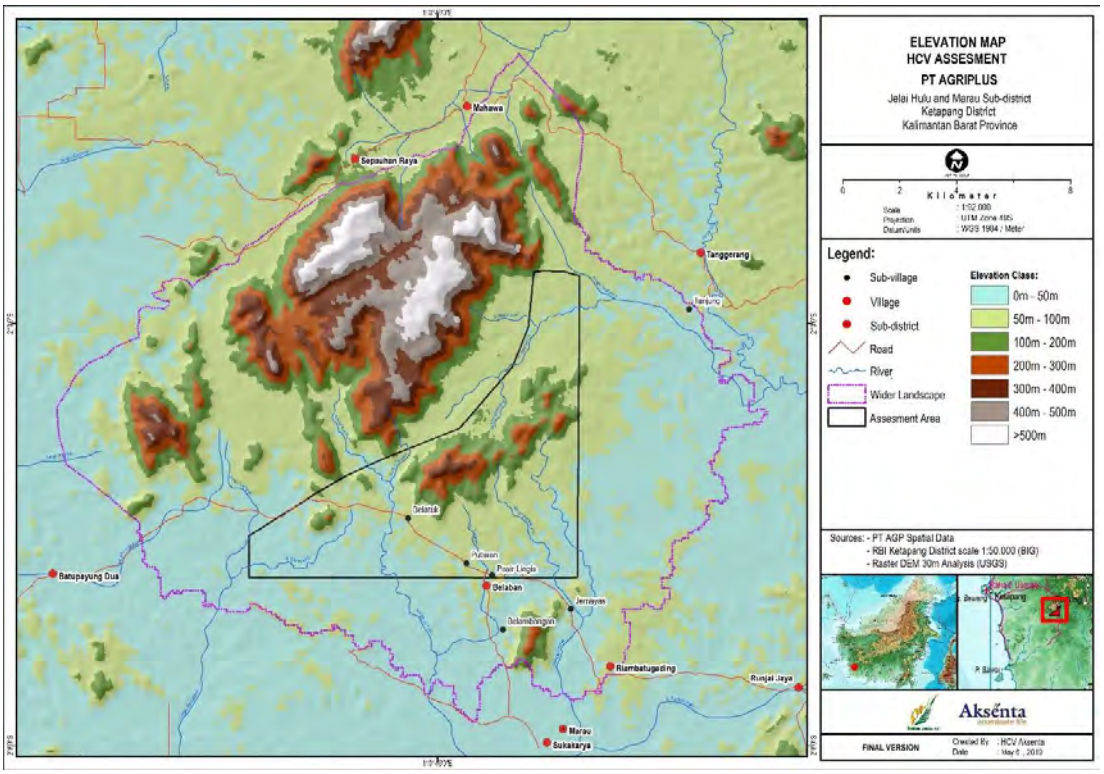
Based on Presidential Decree No. 12 of 2012, the study area is located in the Jelai-Kendawangan River Region. Most (76%) of this area is located in the Kendawangan watershed, while the rest (24%) is in the Jelai watershed (Map 13). Based on its position on the watershed

boundaries, the study area is located in the upper reaches, so that the presence of water catchment areas (hills) or rivers in this region has an important role in the hydrological context of the region.

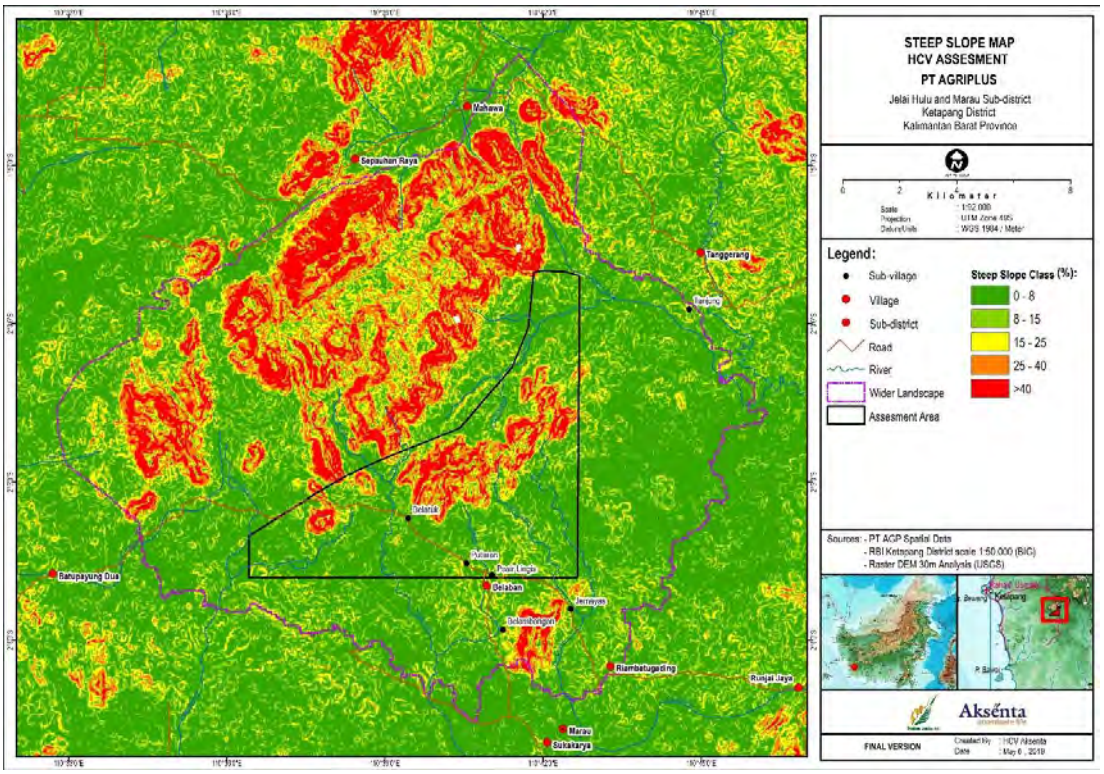
The entire study area is located at an altitude of <400 m asl (Map 14). Half (50%) of the area is at an altitude of 50-100 m above sea level. In the middle, there is a hilly area that has a height of 200-400 m above sea level. Hilly areas are also found to the north of the study area, namely in the Gunung Raya Protected Forest Area. In general, the study area is a flat area with a slope of <8% (Map 15). However, in this area there are steep sloped areas (slopes of 25% to> 40%). These areas are hills which are still partially covered by secondary forests and shrubs. The existence of this hill area has important value in the context of environmental services, especially related to the water catchment, erosion control and sedimentation.



Map 14: Position of the study area against the boundaries of the Jelai and Kendawangan watersheds



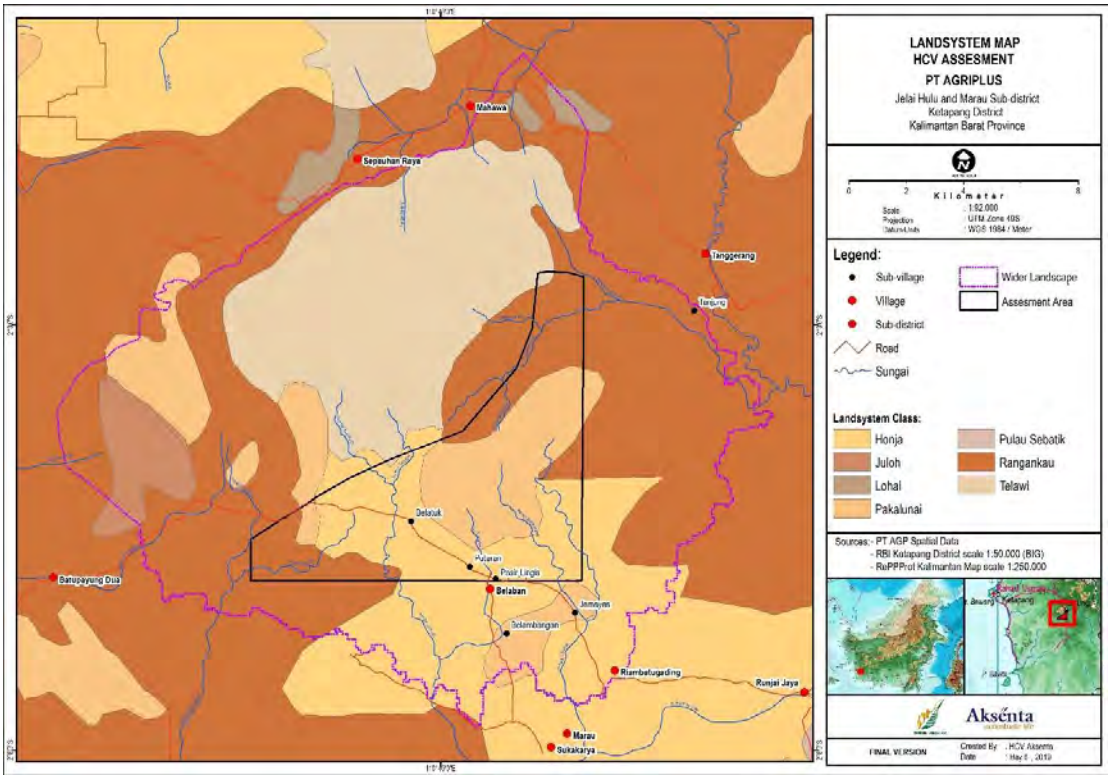
Map 15: Topography in the study area and surrounding areas



Map 16: Slopes in the study area and surroundings

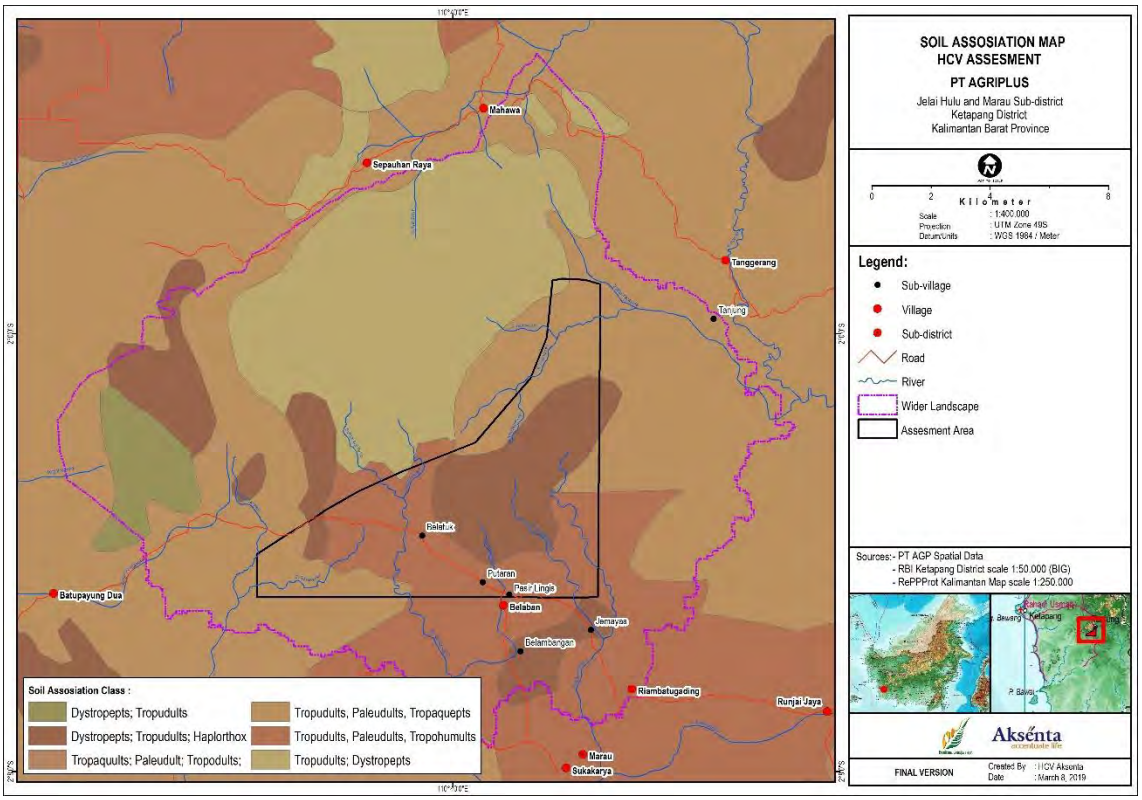
Based on the Land System Map (RePPProT, 1990; Map 17), the study area consists of four land systems, namely Honja (38%), Pakalunai (34%), Rangankau (27%), and Telawi (1%). Areas with Honja and Rangankau land systems are plains with undulating to hillocky landforms. The

Pakalunai land system has a physiographic form in the form of hills, while Telawi is a mountain range.



Map 17: Land system in the study area and surrounding areas

Soil types in the study area consist of four soil associations (Map 18; RePPProT, 1990), namely: (i) *dystropepts, tropudults, and haplorthox*; (ii) *tropudults, paleudults*, and *tropaquepts*; (iii) *tropodults, paleudults*, and *tropohumults*; and (iv) *tropudults* and *dystropepts*. Of these types of soil, there is no soil included in the category of marginal or fragile soil, such as peat, sand, or acid sulphate soils. Tropudults soil type is the dominant soil found in each land association.



Map 18: Soil types in the study area and surrounding areas

3.3.5 Socio-Cultural Context

Demography and Social Economy

Administratively, the PT AGRIPLUS Location Permit area is within the areas of Belaban Village, Riam Batu Gading (Marau District) and Tanggerang Village (Jelai Hulu). This region is located at the eastern end of Ketapang Regency and is bordered by Sukamara Regency, Central Kalimantan Province (BPS, 2014). Based on village demographic data, the total population in the three villages in the study area is still relatively rare compared to the area. Population density in this region is still below the average population density of Ketapang Regency (Table 15).

Statistical data on population composition based on livelihoods are not available, but based on interviews and observations in the field, the main livelihoods of Belaban and Riam Gading villages are generally rubber, oil palm and other food crops farmers, other livelihoods of traders and employees of plantation companies and PNS employees / honorer. Whereas in Tanggerang Village most work in plantation companies; the rest have livelihoods as rubber farmers, oil palm farmers, food crop farming, traders, civil servants / honorary, agricultural laborers and collectors of agricultural products with the main commodities are rubber, palm oil, agricultural crops and other food crops (Table 16).

Table 15: Demography of villages in the study area

Sub-District	Village	Area (km²)	Population				Ratio
			Family	People	Male	Female	
Marau	Belaban	268,24	684	2.438	1.264	1.174	108
	Riam Batu Gading	138,71	450	1.649	844	805	105
Jelai Hulu	Tanggerang	218,50	599	1.903	925	978	109

Source: Marau and Jelai Hulu Sub-Districts in Number, 2016 (BPS of Ketapang District, 2017)

Table 16: Socio-economic condition in the local villages around the Assessment Area

Basic Needs	Village		
	Belaban	Riam Batu Gading	Tanggerang
Source of livelihood	Work in plantation companies (60%), work as rubber farmer (30%) and others (10%)	Work as rubber farmer, oil palm smallholder and crop plantations (80%), while the rest as merchant and plantation company worker and permanent/contract Civil State Employee	Work in plantation companies, while the rest work as rubber farmer, oil palm smallholder, crop farmer, merchant, permanent/contract Civil State Employee, plantation labourer and farming product collector.
Accessibility, transportation, communication and energy	Local villages in the Assessment Area has road network, some of which are still in the form of dirt roads, while others are already asphalt roads, although several parts of the roads already start getting damaged. The entire village road network is connected directly by provincial road network to the district capital (Tumbang Titi – Manis Mata-Telayap- Sandai-Trans Kalimantan) Public transports (cars) are available for rent, particularly for long distance use. For daily use (short distance), community uses motorcycles. Mobile phone service coverage is yet to entirely reach the Assessment Area. Only certain locations, such as around Riam Batu Gading Village Hall, is covered. In other locations some people use signal boosters/antenna. Electricity from State Electricity Company (PLN) is yet to operate 24 hours, except in sub-district capital. To have electricity, community uses village and personal generator set, as well as solar panel from government aid.		
	Fuel oil can be easily obtained in all villages Cooking fuel: most of local families already use LPG, but some others are still using firewood.		
Education and health	Available education facilities include 2 units of kindergarten, and 4 units of elementary school. As for senior high school, this can be accessed in the nearest village. Health facilities include 2 units of village health centres, and 3 mother and	Available education facilities only include 1 unit of elementary school, while junior high school and senior high school can be accessed in the nearest villages (Runjai Jaya, Randai, and Suka Karya (parent village)) Public Health Centre is available in Marau	Available education facilities include 1 unit of kindergarten and 3 units of elementary school, while junior and senior high schools are available in the nearest village (Teluk Rinjai) Health facility includes 1 unit of auxiliary Public Health Centre. For certain illness,

Basic Needs	Village		
	Belaban	Riam Batu Gading	Tanggerang
	children health centres. For certain illness, people get referred to Public Health Centre in Marau Sub-District.		people get referred to Public Health Centre in Jelai Hulu Sub-District
	Needs for medicines are mostly met through buying. However, there are community members who still use traditional herbs that they can obtain from around the local settlement.		
Water (for consumption and sanitation)	Needs for drinking water (consumption) and sanitation are met from source of water within PT Agriplus concession, i.e. Senggraha and Riam Kekalap springs, and Air Putih River.	Drilled well and stream get dried during dry seasons. Clean water is mostly obtained from dug wells or pumped wells. For the needs for sanitation, especially during dry seasons, community uses river water.	Needs for drinking water (consumption) and sanitation are met from dug well (water is taken from well to water tank), spring and Sepupuan River.

Source: Interview, field visit by Aksenta (2017)

Ethnic, Culture and Religion

The majority of indigenous communities in the study areas are the Dayak Jelai Tribe and the Dayak Kendawangan Tribe. Other tribes are migrant tribes originating from Java, Sumatra and Sulawesi (Table 17). The practice of customs is limited and ceremonial. In the implementation of these customs and culture, it is very closely related to the cycle of human life (birth, maturity, illness, marriage, and death), as well as the cycle of paddy farming (planting and harvesting). The ceremonies related to the human life cycle have been filled with religious values, according to the religion they profess. The social infrastructure of the community and their daily lives are more governed by state law (positive law). Catholicism is a religion adopted by the majority of the population in the villages in the study area. In addition, there are also members of the community who embrace Protestantism and Islam. In a limited number there are still adherents of ancestral beliefs (animism), especially the parents. Islam is usually adopted by migrants.

Table 17: Composition of ethnicity and religion in the local villages in the Assessment Area

Village	Sub-District	Ethnicity	Religion
Belaban	Marau	Native community: Dayak Jelai (95%) Immigrant community: Javanese and Malay (5%)	Catholicism (50%), Protestantism (45%), Islam (5%)
Riam Batu Gading	Marau	Native community: Dayak Kendawangan (80%) Immigrant community: Javanese (Demak), and others from Sulawesi, and Sumatera (20%)	Catholicism (60%), Protestantism (35%), Islam (5%)
Tanggerang	Jelai Hulu	Majority: Dayak Jelai (90%) Immigrant community: Javanese, Chinese, Malay (10%)	Catholicism (90%), Protestantism and Islam (10%)

Source: Aksenta interview (2017)

3.3.6 Presence of HCVs

The results of this study conclude, that in the study area there are all types of HCV, ranging from HCV 1 to HCV 6 as presented in the summary of the presence of HCV in Table 18.

Table 18: HCV Identification Summary in PT AGRIPLUS landscape area

		Summary of Description and Justification		
HCV	**Definition**	**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	Population of endemic or RTE species, i.e. 18 bird, 11 mammal, 2 reptilian and 5 plant species	There is an indication of the presence of orangutan in Gunung Raya Protection Forest	-
2	Large landscape-level ecosystems, ecosystem mosaics and Intact Forest Landscapes (IFL) 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	Some small parts of the area overlap with Gunung Raya Protection Forest constituting an important ecosystem at landscape level or areas important to the availability of supporting habitats to apex predator or wide-ranging species.	-	-
3	Rare, threatened, or endangered ecosystem, habitats or refugia	There remains threatened ecosystem in the hill area, i.e. mixed dipterocarp forest.	-	-
4	Basic ecosystem services in critical situations, including protection of water catchments and control of erosion of vulnerable soils and slopes	There are areas playing important roles to regulate local hydrologic aspects, i.e. rivers and their banks, hilly areas, and springs.	-	-

		Summary of Description and Justification		
HCV	**Definition**	**Present**	**Potential**	**Absent**
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	There are important areas as source of local community needs, i.e. river and spring (source of water).	-	-
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	There are areas important to local community culture and history, i.e. sacred sites, burial ground, and tembawang.	-	-

HCV 1

There are a number of conditions that are indicative of detecting the presence of HCV 1 areas (Brown *et al.,* 2017) as presented in Table 19. The results of the study found that conditions that meet the HCV 1 criteria can be found in the study area.

Table 19: Indication of the HCV 1 in the Assessment Area

HCV 1 Requirement (Brown et al., 2017)	Present/ Absent
High species richness, diversity or uniqueness	-
Populations of multiple endemic or RTE species	✓
Important populations or a great abundance of individual endemic or RTE species	-
Small populations of individual endemic or RTE species, in cases where the national, regional or global survival of that species is critically dependent on the area in question	-
Sites with significant RTE species richness	-
Particularly important genetic variants, sub-species or varieties	✓

Note: ✓= present; - = absent

Justification

The closest protected area to the study area is Gunung Raya Protection Forest (HL) which is in the north. Although the protected status of the area is as a water catchment area, its existence can be a proxy for biodiversity in the study area. Most of the study areas, especially areas with sloping slopes, have changed their land use to oil palm plantations. Remnants of forested areas

can still be found on the hilltop, namely in Kalanglampung Hill, Betung Hill, and in the area around the Riam Kekelap Spring.

Based on field survey results in the study area there were 63 species of birds, 19 species of mammals, 9 species of reptiles and amphibians, and 250 species of plants. HCV Criteria 1 is met by the presence of 18 species of RedList IUCN and 5 species of Appendix I CITES. Species included in the IUCN RedList consist of 11 species of mammals, 2 species of reptiles, and 5 species of plants (**Table 20**). Endemic flora groups were not found, while Borneo several endemic fauna species were found, namely red langur (*Presbytis rubicunda*), white forehead (*Presbytis frontata*), kelempiau (*Hylobates albibarbis*), lemurs (*Nyctigebus menagensis*), clouded leopards (*Neofelis diardii*), Slow Loris (*Nycticebus menagensis*), and Kalimantan bondol (*Lonchura fuscans*).

Important sub-species variants in the Kalimantan Forest are orangutans (Pongo pygmaeus) and gibbons (Hylobates spp). The study area and its surroundings are included in the distribution of orangutan sub-species (P. p. Wurmbii) and gibbons (H. Albibarbis). Even though it is an orangutan distribution area, the existence of orangutan species has not been found since 2006, when the forest was cleared to become a rubber plantation. Based on community information, it is estimated that the existence of this orangutan moved away towards HL Gunung Raya. Opportunities for orangutan movement are possible if there is an increase in disturbance at HL Gunung Raya. Based on this, orangutans are still an important record in potential HCV 1 that is outside the study area.

Table 20: Status of RTE species in PT AGRIPLUS concession

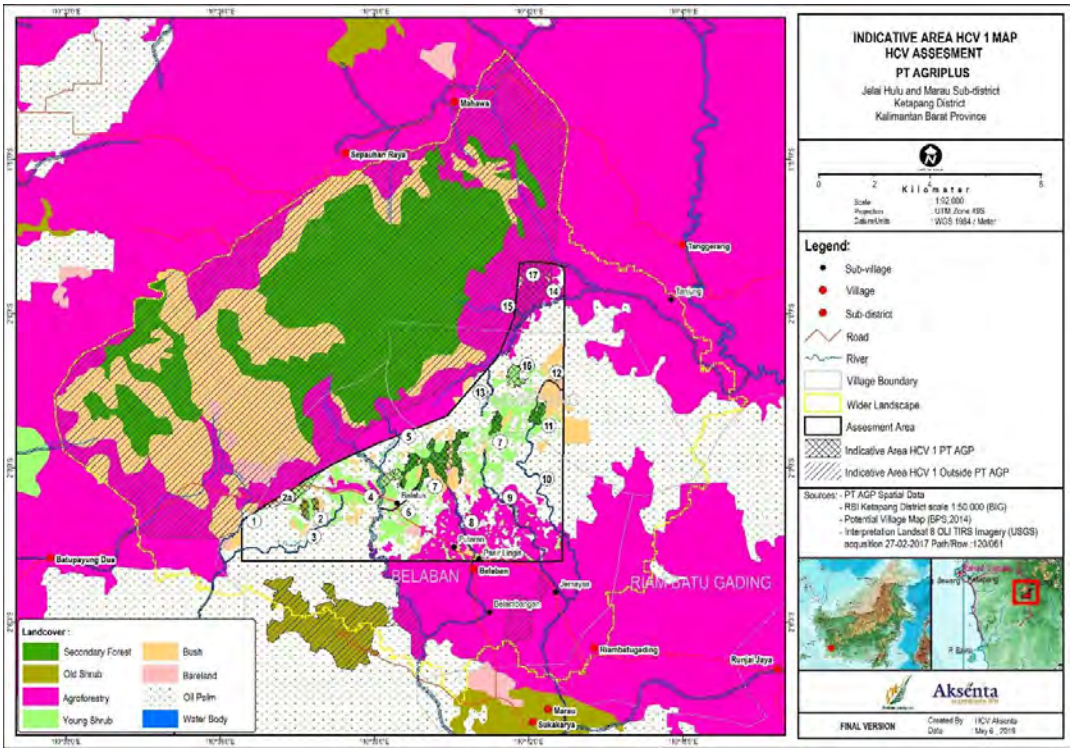
No.	Scientific Name	Indonesian Name	Status			Remark
			IUCN	CITES	Law	
Mammal						
1	*Hylobates albibarbis*	Kelempiau	EN	App. I	P	Strong information
2	*Helarctos malayanus*	Beruang madu	VU	App. I	P	Scratch mark
3	*Nyctycebus melagenis*	Kukang	VU	App. I	P	Strong information
4	*Tarsius bancanus*	Tarsius	VU	App. II	P	Strong information
5	*Manis javanica*	Trenggiling	CR	App. II	P	Nest
6	*Neofelis diardii*	Macan dahan	VU	App. I	P	Strong information
7	*Presbytis frontata*	Lutung dahi putih	VU	App. II	P	Found
8	*Cervus unicolor*	Rusa sambar	VU	-	P	Strong information
9	*Sus barbatus*	Babi berjenggot	VU	-	-	Strong information
10	*Macaca nemestrina*	Beruk	VU	App. II	-	Strong information
11	*Pongo pygmaeus wurmbii*	Orangutan	CR	App.I	P	Not found, but strong info is found in Gunung Raya Protection Forest
Bird						
1	*Alcedo meninting*	Rajaudang meninting	LC	-	P	Found
2	*Anorrhinus galeritus*	Enggang klihingan	LC	App II	P	Found
3	*Anthreptes malacensis*	Burungmadu kelapa	LC	-	P	Found
4	*Anthreptes singalensis*	Burung madu belukar	LC	App II	P	Found
5	*Arachnothera longirostra*	Pijantung kecil	LC	-	P	Found
6	*Buceros rhinoceros*	Rangkong badak	NT	App II	P	Found
7	*Cuculus micropterus*	Kangkok india	LC	-	NP	Found (migrant)
8	*Elanus caeruleus*	Elang tikus	LC	App II	P	Found
9	*Gracula religiosa*	Tiong emas	LC	App II	P	Found
10	*Ictinaetus malayensis*	Elang hitam	LC	App II	P	Found

No.	Scientific Name	Indonesian Name	Status			Remark
			IUCN	CITES	Law	
11	*Leptocoma sperata*	Burung madu pengantin	LC	-	P	Found
12	*Lonchura fuscans*	Bondol kalimantan	LC	-	NP	Found
13	*Loriculus galgulus*	Serindit melayu	LC	App II	NP	Found
14	*Microhierax fringillarius*	Alapalap capung	LC	App II	P	Found
15	*Nisaetus cirrhatus*	Elang brontok	LC	App II	P	Found
16	*Pelargopsis capensis*	Pekaka emas	LC	-	P	Found
17	*Pernis ptilorhynchus*	Sikepmadu Asia	LC	App II	P	Found (migrant)
18	*Rhipidura javanica*	Kipasan belang	LC	-	P	Found
19	*Turdus obscurus*	Anis kuning	LC	-	NP	Found (migrant)
Herpetofauna						
1	*Notochelys platynota*	Kura-kura ceper	VU	-	-	Found
2	*Amyda cartilaginea*	Labi-labi	VU	App. II	-	Found
Flora						
1	*Shorea leprosula*	Meranti	EN	-	-	Found
2	*Aquilaria malacensis*	Gaharu	VU	App. II	P	Found
3	*Eusideroxylon zwagery*	Ulin	VU	-	P	Found
4	*Dipterocarpus cornutus*	Keruing	CR	-	-	Found
5	*Durio kutejensis*	Durian Lae	VU	-	-	Found

Source: Aksenta field survey (Aksenta, August 2017)
Note: EN: endangered; VU: vulnerable, P: protected by Law 5 of 1999 and Government Regulation No. 7/1999)

Location and Size of HCV 1 Areas

Referring to the presence of important species and important habitats for RTE species, the HCV 1 area is the flow of the river and its banks (30-50 m wide) and secondary forest areas or natural vegetation on hilltops (**Map 19**). The total HCV 1 area is 821.7 ha (**Table 21**).



Map 19: Distribution of HCV 1 in the area of PT AGRIPLUS

Table 21: Location and size of HCVA1 in PT Agriplus Location Permit concession

ID	Location	Area (ha)
1	River Langsat and its riverbank (width: 30 m)	0.8
2	Shrub areas on Kalanglampung – Semerumbung hills	25.0
2a	Areas overlapping with Gunung Raya Protection Forest Area	64.0
3	River Sanawansik and its riverbank (width: 30 m)	22.7
4	River Air Putih and its riverbank (width: 50 m)	66.7
5	River Depatut and its riverbank (width: 30 m)	5.7
6	River Sementabang and its riverbank (width: 30 m)	8.4
7	Forested area on Limau Tupai – Sembelayang hills, including Riam Kekalap spring's buffer zone (buffer width: 200 m radius) and wildlife corridor to River Air Putih.	221.3
8	River Sentabik and its riverbank (width: 30 m)	22.2
9	River Sengabang and its riverbank (width: 30 m)	34.6
10	River Kampak and its riverbank (width: 30 m)	25.1
11	Forested area on Betung Hill	27.8
12	River Panyangkauan and its riverbank (width: 30 m)	11.5
13	River Bepinsang and its riverbank (width: 30 m)	12.3
14	River Sepupuan and its riverbank (width: 50 m); this area is also in overlap with Gunung Raya Protected Forest area.	38.5
15	River Sejelemuan and its riverbank (width: 30 m); this area is also in overlap with Gunung Raya Protected Forest area.	2.7
16	Thicket area on Batu Manunggul hill.	31.3
17	Areas in overlap with Gunung Raya Protected Forest area.	201.1
Total Size of HCVA 1		821.7

HCV 2

Several situations to detect the presence of HCV 2 areas (Brown, et.al, 2017) are presented in Table 22. Based on these criteria, the results of this study concluded that HCV 2 was found in the study area.

Table 22: Indication of HCV 2 in the Assessment Area

HCV 2 Requirement (Brown et al., 2017)	Present/ Absent
Large areas (e.g. could be greater than 50,000ha) that are relatively far from human settlement, roads or other access.	-
Smaller areas that provide key landscape functions such as connectivity and buffering	✓
Large areas that are more natural and intact than most other such areas	-

Note: ✓= present; - = absent

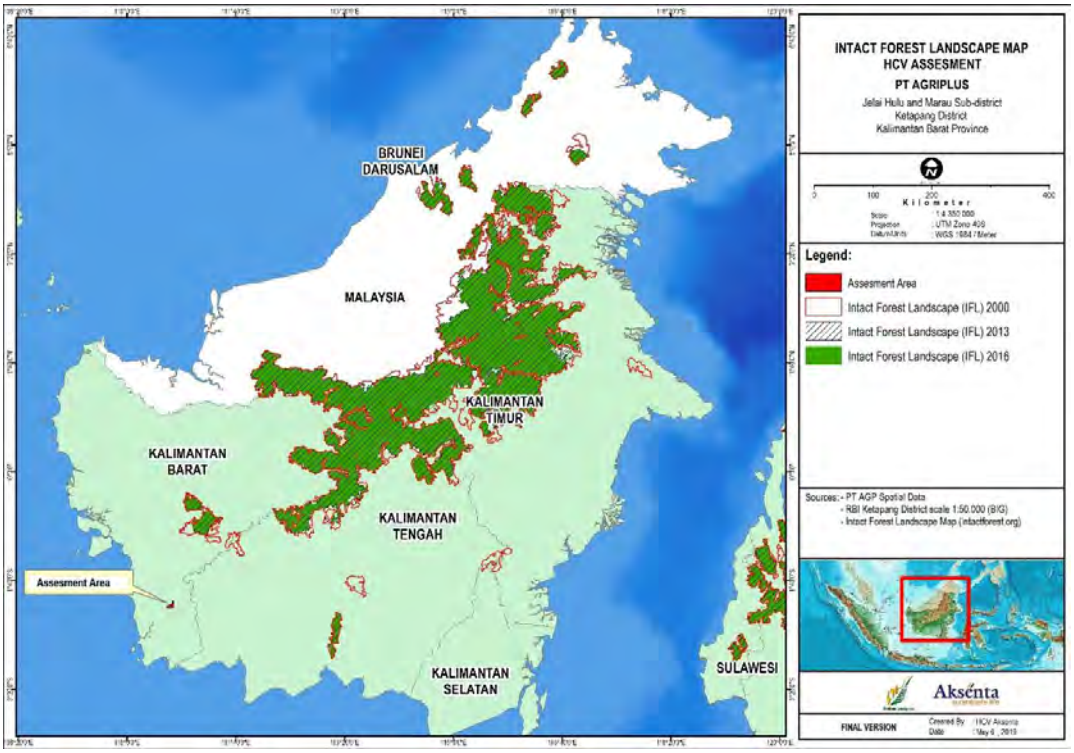
Justification

The study area is not in the Intact Forest Landscape (IFL) area according to a map released by Greenpeace and Forest Watch Indonesia. Based on the map, this area has no longer been intact forested since 2000 (**Map 20**). The closest IFL area to the study area is 113 km northeast. This area is also not part of and is located far from important conservation landscapes, such as IBA, EBA, KBA, Ramsar Site, HoB, and KHG.

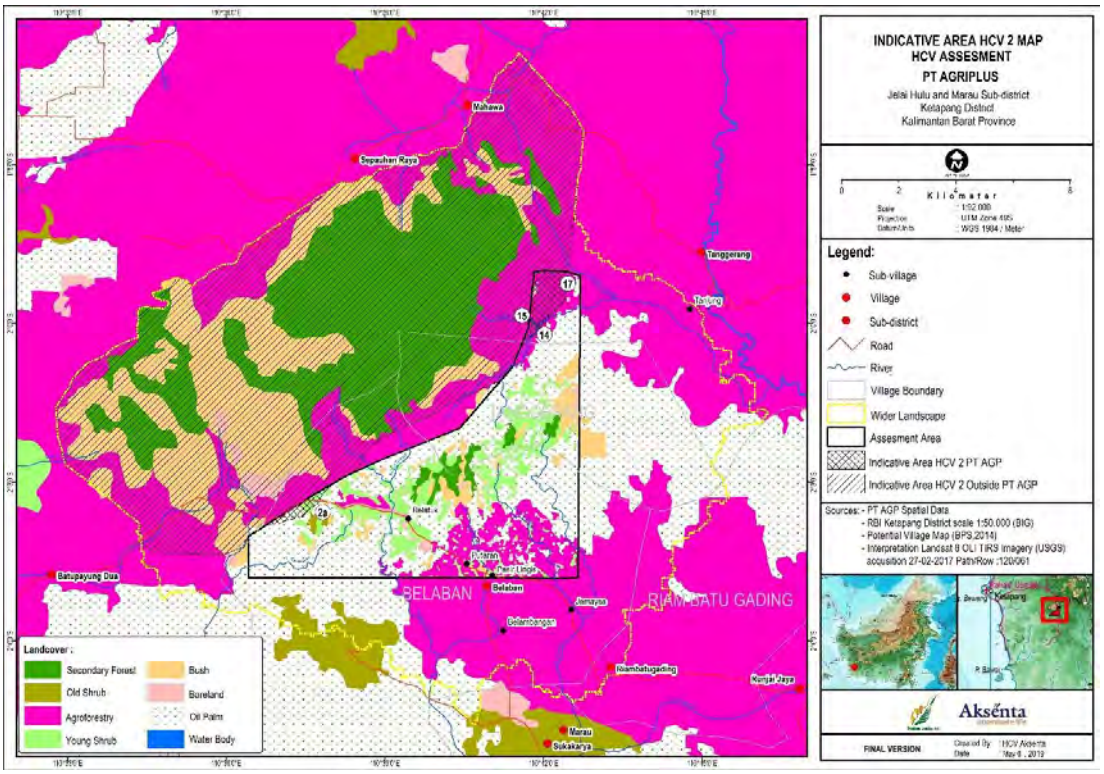
Gunung Raya Protection Forest (HL) has an area of around 15,000 ha. Although this area is less than the threshold used in the guidelines (CG, 2013), this area is an important area for the availability of natural habitat compared to other areas around the study area. This area is considered to be able to support top predators or species with large home ranges such as Kalimantan orangutans, sun bears and various birds of prey. The hilly forest area in the study area is not connected to HL Gunung Raya because it was cut off by oil palm plantations and community mixed plantations. However, broader landscape connectivity and buffering functions are indicated in the northern study area which overlaps with HL Gunung Raya. The area has an important value as a wildlife corridor, especially animals that have a large roaming area that uses forest canopy as a means of moving its place, for example arboreal animals. The area also has the potential as an area of animal visit, especially in terms of foraging activities and shelter.

Location and Size of HCV 2 Areas

Based on the explanation above, although there is landscape fragmentation, it can be concluded that in the study area there are still HCV 2 areas, namely areas that overlap with the HL Gunung Raya area (Map 21). The total area of HCV 2 in the study area is 276 ha. The management area for HCV 2 also includes a HL zone buffer zone with a width of 500 m.



Map 20: Position of PT Agriplus area in the IFL area in 2006, 2013 and 2016



Map 21: Distribution of HCV 2 areas in the area of PT Agriplus

HCV 3

Specifically for HCV 3, HCV identification refers to the 2008 HCV Toolkit for Indonesia using the precautionary approach (Table 23).

Table 23: Identification of HCV 3 using Prudential Approach (HCV Toolkit 2008)

Question	Answer	Indication	Criteria
1. Is one or more ecosystems categorised threatened or rare under Table 8.3.1 or 8.3.2 located (i) within the Management Unit concession; or (ii) outside the Management Unit concession but is likely to get affected by the use planned by the Management Unit?	Yes	Potential HCV 3 may be found within the concession or nearby; proceed to No. 2.	There is a potential or Lowland Dipterocarp Forest under threatened category (PLN, RGK, HNJ, and TLW land systems)
	No	-	-
2. Does the ecosystem constitute vegetation on peatland?	Yes	-	-
	No	Proceed to No. 4.	No peatlands in the assessment area.
3. Has the peatland undergone a drastic change preventing the natural hydrologic system, making the hydrologic function not possible for restoration?	Yes	*N/A*	-
	No	*N/A*	-
4. Has the ecosystem undergone a drastic change of land cover so that it meets 'non-productive land' criteria under	Yes	There might be no potential HCV 3, but it is necessary to proceed to step No. 5.	-

	Question	Answer	Indication	Criteria
	Minister of Forestry Decree No. 21/Kpts-II/2001?	No	HCV 3 is located in the assessment area or its surroundings.	There is the remaining of wood vegetation area, in the form of forest and shrub that are yet to be fully encroached or burn, i.e. areas on the hilltop and others around springs.
5.	Is it still possible to restore the ecosystem through a natural process, if not converted, taking into account the following factors: (i) ecological attributes or unique characteristics of the ecosystem in question; (ii) condition and status of the neighbouring lands; (iii) applicable spatial planning; and (iv) local development planning?	Yes	*N/A*	-
		No	*N/A*	-

Justification

All land systems in the study area, namely Pakalunai (PLN), Rangankau (RGK), Honja (HNJ), and Telawi (TLW), are included in the threatened ecosystem types in Kalimantan, namely Mixed Dipterocarpaceae Forest ecosystems on Deep Frozen Rocks (Granite), based on the 2008 Indonesian HCV Toolkit. In this region there was no confirmed peat ecosystem, both based on land system maps and field verification results. The ecosystem in the study area is lowland dipterocarp forest which has experienced a decline in quality due to logging and land conversion. Utilization of natural resources and land use in this region has been going on for a long time, at least intensively starting in the 1980s. Large-scale fires in 1997 and 2015 are also one of the causes of forest degradation in the region.

Even so, the remaining good enough dipterocarp forests can be found on hilltops and areas around springs that are maintained by the community, such as around the Riam Kekalap spring.

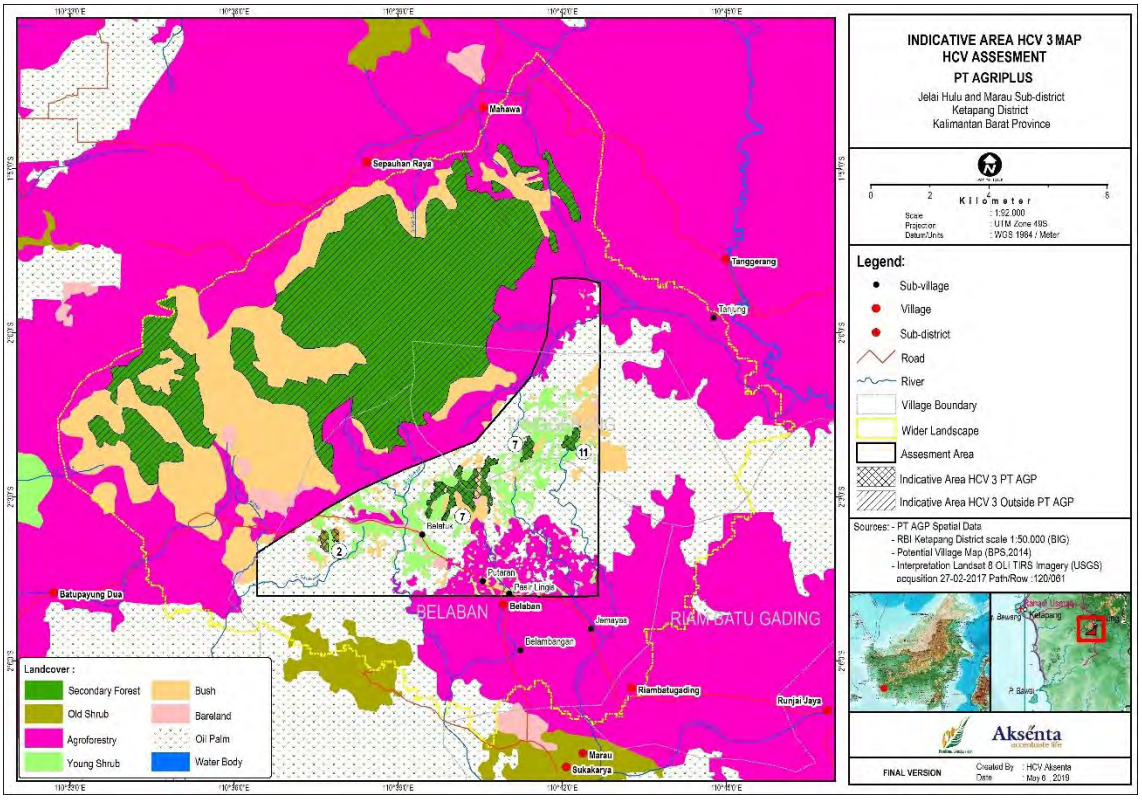
The forest concentration is relatively good and is dominated by a group of young dipterocarps which are quite abundant, from the type of keruing (Dicocarpus cornutus), branches (Shorea ovalis), red meranti (Shorea leprosula), merawan (Hopea dryobalanoides), and ulin (Eusideroxylon zwageri). Therefore, although most of the dipterocarpaceae forest ecosystem in this region has been degraded, there are still some areas that are classified as natural ecosystems.

Location and Size of HCV 3 Areas

The HCV 3 area in this region is a dipterocarp lowland forest ecosystem which is classified as a threatened ecosystem type in Kalimantan. These areas are on the Kalanglampung-Semerumbung Hill, the Limau Tupai-Sembelayang Hill, and the Betung Hill with forest cover and bushland (**Table 24** and **Map 22**). The total area of HCV 3 covers 245.1 ha.

Table 24. Location and size of HCVA 3 in PT AGRIPLUS Location Permit concession

Index	Location	Area (ha)
2	Shrub area on Kalanglampung – Semerumbung hills	25.0
7	Forested area on Limau Tupai – Sembelayang hills	192.3
11	Forested area on Betung hill	27.8
Total Size of HCVA 3		245.1



Map 22: Distribution of HCV 3 in the area of PT Agriplus

HCV 4

The existence of HCV 4 area is detected from the function and value of ecosystem services that play an important role in critical situations. All criteria that indicate the presence of HCV 4 are found in the study area (Table 25).

Table 25: Indications of HCV 4 in the Assessment Area

Requirements of HCV 4 (Brown *et al.*, 2017)	Present/ Absent
Managing extreme flow events, including vegetated riparian buffer zones or intact floodplains	✓
Maintaining downstream flow regimes	✓
Maintaining water quality characteristics	✓
Fire prevention and protection	✓

Requirements of HCV 4 (Brown *et al.*, 2017)	Present/ Absent
Protection of vulnerable soils, aquifers and fisheries	✓
Provision of clean water; and Natural ecosystem important for stabilizing steep slopes	✓
Protection against winds, and the regulation of humidity, rainfall and other climatic elements	✓
Pollination services, for example exclusive pollination of subsistence crops	✓

Note: ✓= present; - = absent

Justification

The main rivers in this region are (i) the Air Putih River which empties into the Kendawangan River, and (ii) the Sepupuan River which empties into the Kepayang River and then to the Jelai River. The two rivers have a relatively similar profile: the width of the river crossing ranges from 10-12 m, the watershed is still naturally vegetated, the river water is clear, and the discharge flows throughout the year. The physical characteristics of the two main rivers indicate that the main river can function as a natural firebreak.

Because the position of the study area is located in the upper reaches of the watershed, rivers in this region has an important function in managing extreme water flow events, especially for downstream flows. The criteria for managing water flow events not only include the river flow, but also include the border of the river as a buffer zone. The entire river border area within the study area also still has a function to maintain river water quality. This relates to land cover in border areas dominated by shrubs and shrubs. The existence of natural / semi-natural vegetation functions as a filter for pollutants, both originating from soil erosion and from residues of agrochemicals carried by surface runoff. River borders that are still covered by natural vegetation, such as those found in the Air Putih River and the Sepupuan River, have relatively high humidity and relatively low air temperatures so as to maintain a balance of microclimate that is suitable for the metabolism of living creatures in the vicinity.

The recommended river border width into the HCV area is 30-50 m. The width is determined based on the function approach and important values found in the border area (Gumbert *et al*., 2009). Other references that are also used in determining border widths are the RSPO Manual on Best Management Practices (BMPs) for the Management and Rehabilitation of Riparian Reserves (Barclay *et al*., 2017) and Simplified Guide Management and Rehabilitation of Riparian Reserve (Lucey *et al*., 2018).

The hilly area located in the middle of the study area contributes to the maintenance of the downstream river flow regime. At the very west, there are Bukit Kalanglampung and Semerumbung. Then in the middle to the north-east, there are Bukit Limau Tupai, Sembelayang, Tunggal, Rimau, Lang Dasa, Bepinsang, Betung, Bijan, and Bukit Batu Manunggal. The existence of these hills also functions as an area controlling erosion and sedimentation; potential as a habitat for pollinating agents; and is a water catchment area that supports the sustainability of spring discharge.

Within the study area six water springs were identified which flowed throughout the year. Three of the six springs have been used intensively by the community in Belaban Village.

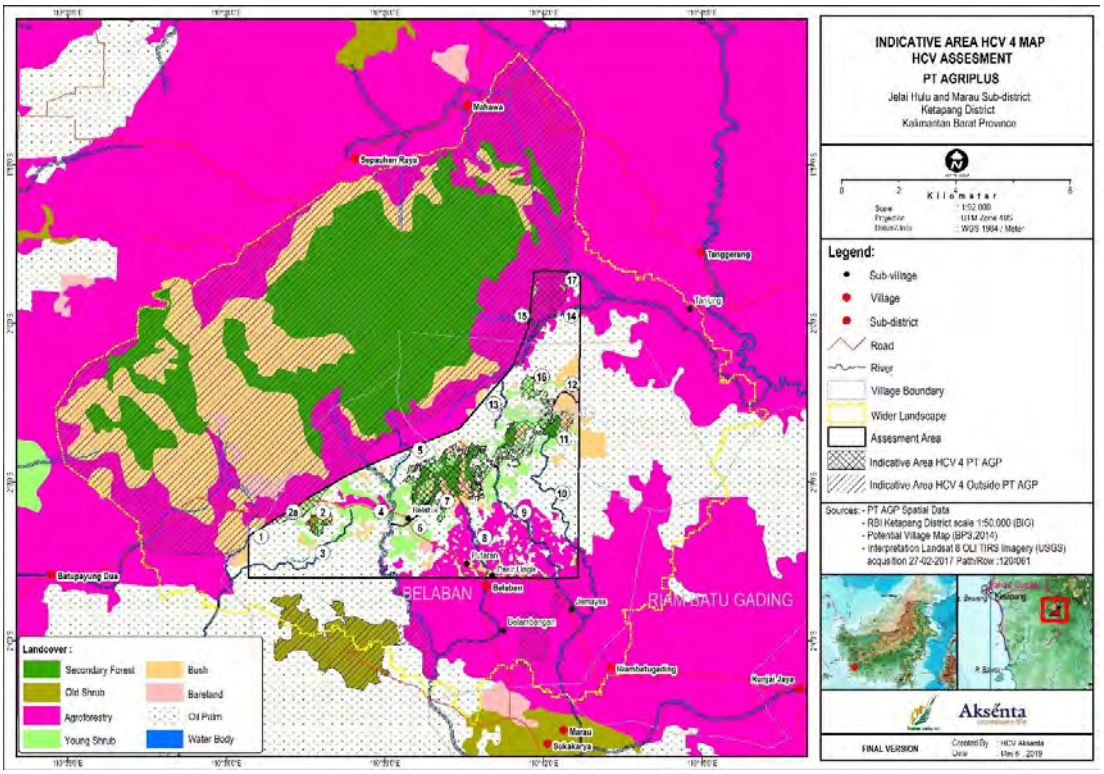
Senggraha Springs are used by the people of Belatuk Hamlet; The Kalalap Riam Spring is utilized by the people of the Round and Pasir Lingis hamlets; while Unak Pulang Springs is utilized by the people of Carik Hamlet. The three springs are used for domestic needs, such as drinking, cooking, and MCK, through piping since 2008.

Location and Size of HCV 4 Area

The total area of HCV 4 identified was 1,197.8 ha spread over 18 locations (Table 26 and Map 23. The area is dominated by hilly areas which cover 78% of the total area of HCV 4. The hilly area is included in the spring and its reservoir (buffer zone radius of 200 m). The HCV 4 area includes not only the tops of hills, but also areas of shrubs on steep slopes, especially areas that are continuous with forested peaks. Steep sloping areas that have been degraded or that have covered bushes and oil palm plantations are not categorized as HCV 4, but are HCV 4 (HCVMA) management areas.

Table 26: Location and size of HCVA 4 in PT Agriplus Location Permit concession

ID	Location	Area (ha)
1	River Langsat and its riverbank (width: 30 m)	0.8
2	Shrub area on Kalanglampung – Semerumbung hills	45.3
2a	Area in overlap with Gunung Raya Protection Forest	64.0
3	River Sanawansik and its riverbank (width: 30 m)	22.7
4	River Air Putih and its riverbank (width: 50 m)	66.7
5	River Depatut and its riverbank (width: 30 m)	5.7
6	River Sementabang and its riverbank (width: 30 m)	8.4
7	Forested area on Limau Tupai – Sembelayang hills, including the presence of Senggraha, Riam Kekalap, and Unak Pulang springs (buffer zone width: 200 m)	555.9
8	River Sentabik and its riverbank (width: 30 m)	22.2
9	River Sengabang and its riverbank (width: 30 m)	34.6
10	River Kampak and its riverbank (width: 30 m)	25.1
11	Forested area on Betung hill	49.1
12	River Panyangkauan and its riverbank (width: 30 m)	11.5
13	River Bepinsang and its riverbank (width: 30 m)	12.3
14	River Sepupuan and its riverbank (width: 50 m); this area is also in overlap with Gunung Raya Protection Forest area	38.5
15	River Sejelemuan and its riverbank (width: 30 m); this area is also in overlap with Gunung Raya Protection Forest area	2.7
16	Shrub area on Batu Manunggul hill	31.3
17	Area in overlap with Gunung Raya Protection Forest area	201.1
Total Size of HCVA 4		1,197.8



Map 23: Distribution of HCV 4 in the area of PT Agriplus

HCV 5

The results of the field study and interviews / discussions using the principles of FPIC indicate that in the study area there is a socioeconomic situation of the community that indicates HCV 5 (Table 27).

Table 27: Indications of HCV 5 in the Assessment Area

Requirements of HCV 5 (Brown *et al.*, 2017)	Present/ Absent
Hunting and trapping grounds (for game, skin and furs)	-
NTFPs such as nuts, berries, mushrooms medicinal plants, rattan	-
Fuel for household cooking, lighting and heating	-
Fish (as essential sources of proteins) and other freshwater species relied on by local communities)	-
Building materials (poles, thatching, timber)	✓
Fodder for livestock and seasonal grazing	-
Water sources necessary for drinking water and sanitation	✓
Items which are bartered in exchange for other essential goods, or sold for cash which is then used to buy essentials including medicine or clothes, or to pay for school fees	✓

Note: ✓ = present; - = absent

Justification

At present, most of the sources of meeting the fundamental basic needs for animal protein (meat) in Belaban, Batu Riam Gading and Tangerang villages are filled with purchases and cultivation (animal husbandry). Even if hunting still occurs within the study area, it is more recreational and not aimed at meeting basic needs. The same is true for the fisheries sector as a source of meeting the needs of animal protein (fish), which is obtained by buying on the market. Even if there are people who fish, it is only done as a hobby. Livestock grazing activities are carried out permanently in their respective gardens / lands or released around the village area. In the study area there are no nomadic herders who use communal managed forests or land.

Open accessibility makes it easier for people to obtain health services, education, and access economic centers. Residents in the study area have adopted a modern lifestyle with a variety of livelihood patterns in meeting their basic needs. People already have a high capacity to accumulate wealth, and are not limited to meeting their daily needs. The biggest cash income of the people (especially Tangerang Village), is mostly obtained from working as laborers / employees in oil palm plantation companies.

When the study was conducted, there were no more communities in the study area that met basic needs by extracting directly from forests / other natural ecosystems (non-cultivation). Likewise with the method of treatment, people prefer the method of modern medicine. Electricity and fuel (BBM) supplies are also available and easily available, both for transportation and production needs. Most households already use LPG gas stoves and kerosene for cooking.

Most of the houses in the study area still use wood as the main material but it has been combined with manufacturing materials (such as cement, brick, zinc, asbestos, plywood, mild steel frame and others). The thatched houses have not been found. Timber building materials are mostly obtained by buying and some are obtained from private and family-owned shrubs and Tembawang plantations in the study area.

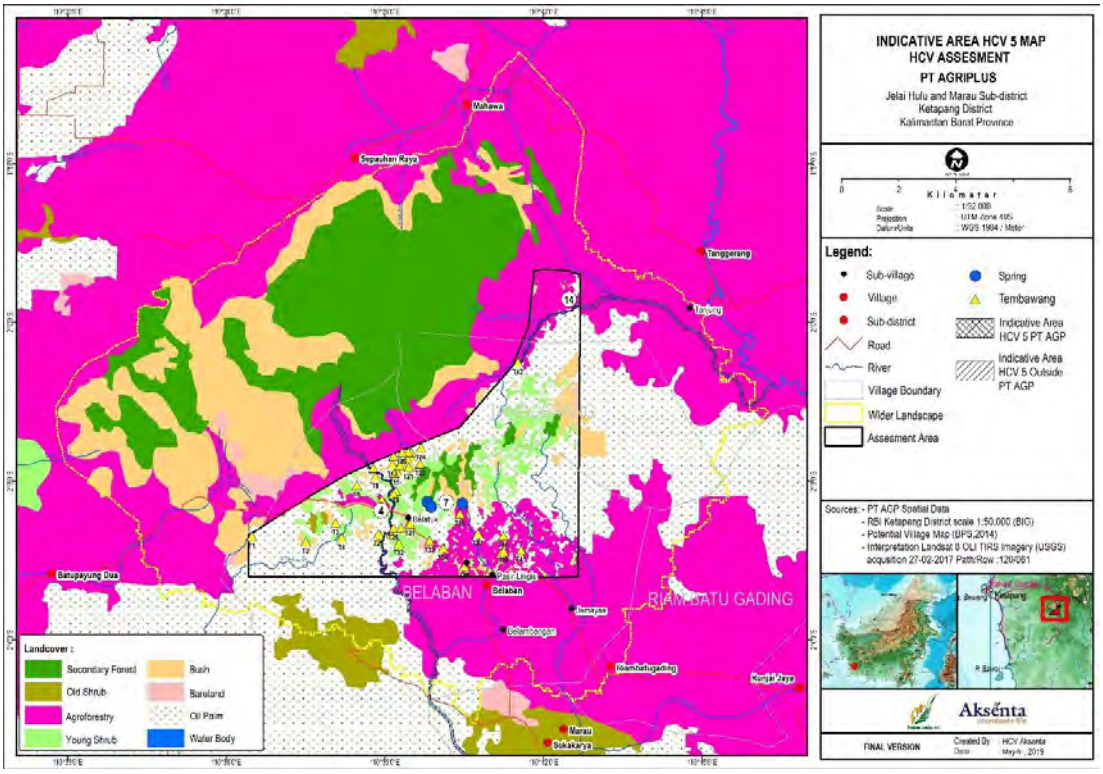
Within the study area there are areas that have important and fundamental values for the local community, namely the area of water supply in the form of springs and rivers that flow throughout the year. This water source is used by the community for consumption, sanitation and agricultural irrigation purposes. The existence of this water source is protected by the community through an agreement on the prohibition of opening fields in the upstream area of the spring, as well as restrictions on fishing activities in the river. Those who violate this agreement may be subject to adat fines. This agreement is also regulated in the Village Regulation since 2012.

Location and Size of HCV 5 Areas

The HCV 5 area that was verified together with the local community consisted of five sites with a total area of 48.5 ha (**Table 28**). The HCV 5 areas are in the form of springs and streams (water bodies) that are used by the community as water sources, both for consumption, sanitation and irrigation purposes. The distribution of HCV 5 area locations at PT AGRIPLUS is presented in **Map 24**.

Table 28: Location and size of HCVA 5 in PT Agriplus Location Permit concession

ID	Location	Important value to community	Area (ha)
7a	Air Senggraha spring and its buffer zone (width: 200 m)	Source of clean water for consumption and sanitation	12.6
7b	Riam Kekalap spring and its buffer zone (width: 200 m)	Source of clean water for consumption and sanitation	12.6
7c	Unak Pulang spring and its buffer zone (width: 200 m)	Source of clean water for consumption and sanitation	12.6
4	River Air Putih	Source of clean water for sanitation and irrigation	7.2
14	River Sepupuan	Source of clean water for sanitation and irrigation	3.5
Total luas area HCV 5			48.5



Map 24: Distribution of HCV 5 in the area of PT AGRIPLUS

HCV 6

HCV 6 represents areas of cultural significance that have an important traditional role for local or indigenous communities. In the Common Guide for HCV Identification (2017), a number of social and cultural situations in the community that are qualified as HCV 6 are explained (Table 29)**.**

Table 29: Indications of HCV 6 in the Assessment Area

Requirements of HCV 6 (Brown *et al.*, 2017)	Present/ Absent
Sites recognised as having high cultural value within national policy and legislation.	-
Sites with official designation by national government and/or an international agency like UNESCO.	-
Sites with recognised and important historical or cultural values, even if they remain unprotected by legislation.	✓
Spiritual or sacred sites, burial grounds or sites at which traditional ceremonies take place that have importance to local or indigenous people.	✓
Plant or animal resources with totemic values or used in traditional ceremonies.	-

Note: ✓= present; - = absent

Justification

In the study area there are no sites / sites or distribution sites that are recognized by national policy and legislation of high cultural value. In West Kalimantan, only 15 cultural reserves have been recognized by the government by issuing a decree based on the Law on Protection of high historical value objects regulated in Law No. 11 of 2010 concerning Cultural Heritage. The cultural site that is recognized by national policy and legislation closest to the study area is the Royal Palace of Matan Tanjungpura, which is located in Sampit Village, Delta Pawan District, Ketapang Regency with a distance of about 45 km.

Sites/locations for official determination of national governments and / or international institutions (UNESCO) are not available in the study area. Sites listed on the Tentative List of UNESCO World Heritage Sites are located in Embaloh Hulu, Embaloh Hilir and Putussibau Districts, Kapuas Hulu Regency, West Kalimantan Province, namely the Betung Kerihun National Park (Transborder Rainforest Heritage of Borneo). The area is about 450 km from the study area.

Based on field observations and interviews, it is known that in the study area there are areas that have cultural and spiritual values, especially related to the beliefs of the Dayak community. These areas are sacred sites, Tembawang, former settlements, and cemeteries. The area is a site that is quite important for local people, although it is not protected by law.

Tembawang; or often referred to as agroforests, is a form of land use system that consists of various types of plants, ranging from large trees. This system is managed with certain techniques according to their local wisdom and follows social and customary rules so as to form a complex diversity resembling a forest ecosystem. Tembawang management is regulated by ownership and utilization based on community groups, ranging from personal use, nuclear family, extended family up to the village level containing very high socio-cultural values. Fruit trees (durian, langsat, kelampai, kumpang, limat (janta ') and kekalik) are plants that have important value not only in economic terms but also culture for the Dayak community in the

study area. Therefore, in their custom there is a traditional fruit ceremony which is usually done at every fruit season.

The Dayak community in the study area still believes and respects the existence of sacred places and old graves that are considered to have magical powers. The existence of these places is still visited and maintained by the surrounding community. Most of the ancestral graves found in the study area are in the Tembawang area. Similar to the tomb, sacred places are also widely available in the area of Tembawang. The form of sacred areas in the field in the form of stones, large trees, old trees, or sacred tombs. While sites / locations of plant or animal resources that have totem values or for traditional ceremonies are not found in the study area. The implementation of traditional ceremonies in the study area is more ceremonial and cultural in nature, and is more influenced by the religion of each ethnic group.

Location and Size of HCV 6 Areas

In the study area there were 42 Tembawang locations, 7 sacred sites, and 24 grave sites. The total area of HCV 6 in the PT AGRIPLUS Location Permit area is 130.5 ha (**Table 30**). The HCV 6 area distribution consisting of Tembawang, tombs and sacred places is presented in **Map 24**.

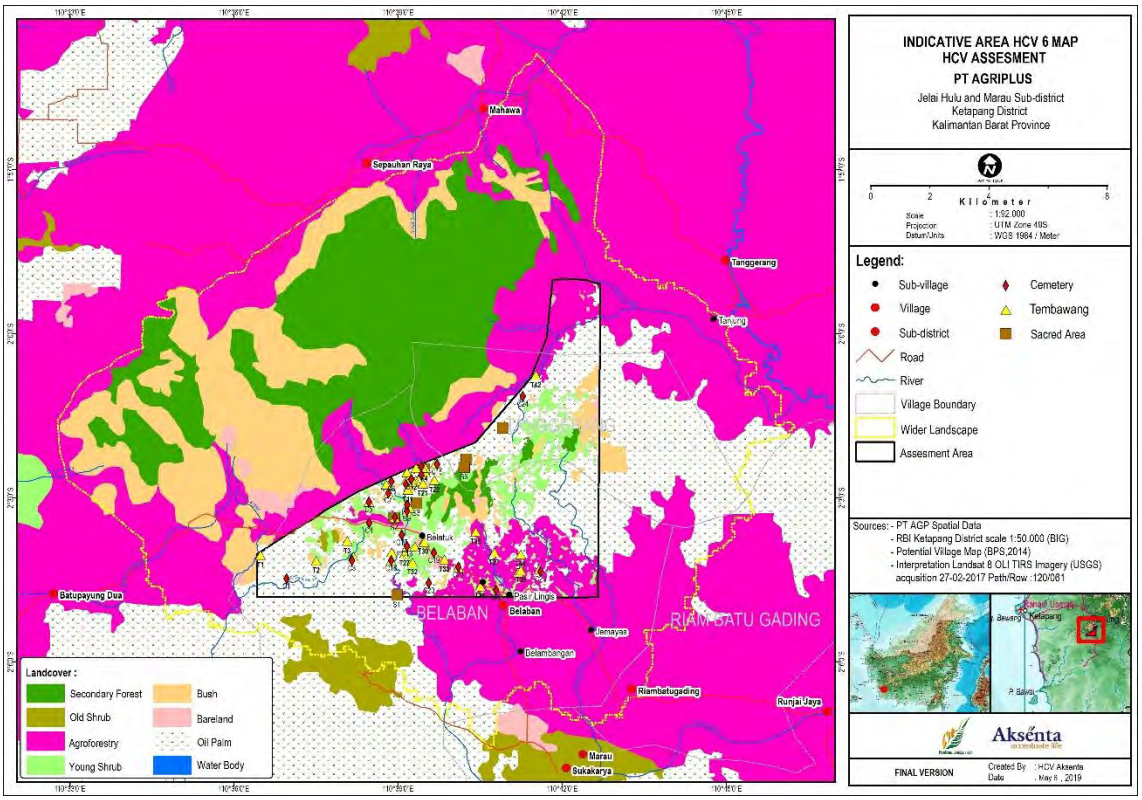
Table 30: Location and size of HCVA 6 in PT Agriplus Location Permit concession

ID	Location	Importance to Community	Size (ha)
Tembawang			
T1	Lubuk Buluh Tembawang	Cultural, ecological, or spiritual/sacred values	0,5
T2	Selampiyan Tembawang	Cultural, ecological, or spiritual/sacred values	1
T3	Kurung Beringin Tembawang	Cultural, ecological, or spiritual/sacred values	0,5
T4	Lubang Lundung Tembawang	Cultural, ecological, or spiritual/sacred values	0,8
T5	Tumbangan Penalang and Asam Buah Burial Ground	Cultural, ecological, or spiritual/sacred values	3
T6	Sayang Tedung Tembawang	Cultural, ecological, or spiritual/sacred values	3
T7	Sungai Ketupat Tembawang and Old Burial Ground	Cultural, ecological, or spiritual/sacred values	2
T8	Tempajak / Lubang Lalabi Tembawang and Burial Ground	Cultural, ecological, or spiritual/sacred values	2
T9	Semempulang Tembawang	Cultural, ecological, or spiritual/sacred values	1
T10	Benua Lambat Tembawang and Old Burial Ground	Cultural, ecological, or spiritual/sacred values	6
T11	Segarangan Tembawang	Cultural, ecological, or spiritual/sacred values	1,5
T12	Sepasaran Tembawang	Cultural, ecological, or spiritual/sacred values	0,5
T13	Riam Tembawang	Cultural, ecological, or spiritual/sacred values	5
T14	Kusik Tenggalung Tembawang	Cultural, ecological, or spiritual/sacred values	7
T15	Kampung Muda Tembawang	Cultural, ecological, or spiritual/sacred values	3
T16	Selunakan Tembawang	Cultural, ecological, or spiritual/sacred values	1
T17	Batu Besar Tembawang and Burial Ground	Cultural, ecological, or spiritual/sacred values	2

ID	Location	Importance to Community	Size (ha)
T18	Siakaman Tua Tembawang	Cultural, ecological, or spiritual/sacred values	3
T19	Siakaman Pandaman Tembawang	Cultural, ecological, or spiritual/sacred values	2
T20	Seprayunan Tembawang	Cultural, ecological, or spiritual/sacred values	0,01
T21	Petapuk-Durian Beruk-Durian Denyiur Tembawang	Cultural, ecological, or spiritual/sacred values	3
T22	Lata Tembawang	Cultural, ecological, or spiritual/sacred values	2
T23	Karah Beruang Tembawang	Cultural, ecological, or spiritual/sacred values	3
T24	Sungai Belabu Tembawang and Pail Burial Ground*	Cultural, ecological, or spiritual/sacred values	0
T25	Upuy Jaling Sacred Burial Ground & Muara Danau Blatuk Setembirikan Tembawang	Cultural, ecological, or spiritual/sacred values	5
T26	Rantau Panjang Tembawang	Cultural, ecological, or spiritual/sacred values	3
T27	Pulau Nangka Tembawang	Cultural, ecological, or spiritual/sacred values	2,5
T28	Muara Sementabang Tembawang and Burial Ground	Cultural, ecological, or spiritual/sacred values	0,25
T29	Sementabang Tuha Tembawang	Cultural, ecological, or spiritual/sacred values	5
T30	Sementabang Muda Tembawang	Cultural, ecological, or spiritual/sacred values	3,5
T31	Muara Sungai Kusik Tembawang	Cultural, ecological, or spiritual/sacred values	1
T32	Serapuan Tembawang	Cultural, ecological, or spiritual/sacred values	4
T33	Pakit Tembawang	Cultural, ecological, or spiritual/sacred values	1
T34	Sinabaka Tembawang and Bakah Berandung Burial Ground	Cultural, ecological, or spiritual/sacred values	1
T35	Riam Kekalap Tembawang	Cultural, ecological, or spiritual/sacred values	2
T36	Perumahan Kopi Tembawang	Cultural, ecological, or spiritual/sacred values	2
T37	Sebabahan Tembawang	Cultural, ecological, or spiritual/sacred values	20
T38	Seminting Tembawang	Cultural, ecological, or spiritual/sacred values	0,05
T39	Pangkalan Tembawang	Cultural, ecological, or spiritual/sacred values	0,05
T40	Air Mengkuang Tembawang	Cultural, ecological, or spiritual/sacred values	3
T41	Benyait Tembawang	Cultural, ecological, or spiritual/sacred values	0,04
T42	Batu Menunggulan Tembawang	Cultural, ecological, or spiritual/sacred values	2
Total Area of *Tembawang*			108,2
Burial Ground			
C1	Semial Burial Ground	Cultural or spiritual/sacred values	0,005
C2	Kesirin Burial Ground	Cultural or spiritual/sacred values	0,5
C3	Kalimantan Pait Burial Ground	Cultural or spiritual/sacred values	0,2
C4	Jumpung Limat Burial Ground	Cultural or spiritual/sacred values	1
C5	Tumbangan Penalang and Asam Buah Burial Ground *	Cultural or spiritual/sacred values	-
C6	Sejambur Burial Ground	Cultural or spiritual/sacred values	0,01
C7	S. Tempajak / Lubang Lalabi* Tembawang & Burial Ground	Cultural or spiritual/sacred values	-
C8	Sungai Ketupat Tembawang and Old Burial Ground*	Cultural or spiritual/sacred values	-

ID	Location	Importance to Community	Size (ha)
C9	Benua Lambat Tembawang and Old Burial Ground	Cultural or spiritual/sacred values	0
C10	Impar Old Burial Ground	Cultural or spiritual/sacred values	2
C11	Riam Burial Ground	Cultural or spiritual/sacred values	0,01
C12	Sekumpangan Burial Ground	Cultural or spiritual/sacred values	0,01
C13	Batu Besar Tembawang and Burial Ground	Cultural or spiritual/sacred values	0
C14	Siakaman Pandaman Burial Ground & Tembawang	Cultural or spiritual/sacred values	0,01
C15	Sungai Belabu Tembawang and Pail Burial Ground	Cultural or spiritual/sacred values	0
C16	Muara Sementabang Tembawang and Burial Ground *	Cultural or spiritual/sacred values	-
C17	Jumpung Tanam Belatuk Burial Ground	Cultural or spiritual/sacred values	1
C18	Upuy Jaling Sacred Burial Ground & Muara Danau Blatuk Setembirikan Tembawang*	Cultural or spiritual/sacred values	-
C19	Pakit Burial Ground	Cultural or spiritual/sacred values	0,5
C20	Atugila Burial Ground	Cultural or spiritual/sacred values	0,049
C21	Sinabaka Tembawang and Bakah Berandung Burial Ground *	Cultural or spiritual/sacred values	-
C22	Putaran and Pasir Linggis Burial Grounds	Cultural or spiritual/sacred values	2
C23	Benyait Tembawang and Burial Ground *	Cultural or spiritual/sacred values	-
C24	Bepinsang Pelalin Burial Ground	Cultural or spiritual/sacred values	0,5
Total Area of Burial Ground			7,8
Sacred Sites			
S1	Lelambang Atuk Patang (sacred site)	Cultural or spiritual/sacred values	1
S2	Pulau Ibul Sacred Site	Cultural or spiritual/sacred values	3
S3	Batu Bekunci Sacred Site	Cultural or spiritual/sacred values	1
S4	Danau Tetilik Sacred Site	Cultural or spiritual/sacred values	2
S5	Tung Panitan Sacred Site	Cultural or spiritual/sacred values	4
S6	Kupang Kupit / Nini Pangau Sacred Forest	Cultural or spiritual/sacred values	3
S7	Kubangan Pelalin Guntung Sacred Site	Cultural or spiritual/sacred values	0,5
Total Area of Sacred Sites			14,5
Total Area of HCVA 6 in PT AGRIPLUS Concession			**130,5**

*Note: *) burial ground area is already included in tembawang*



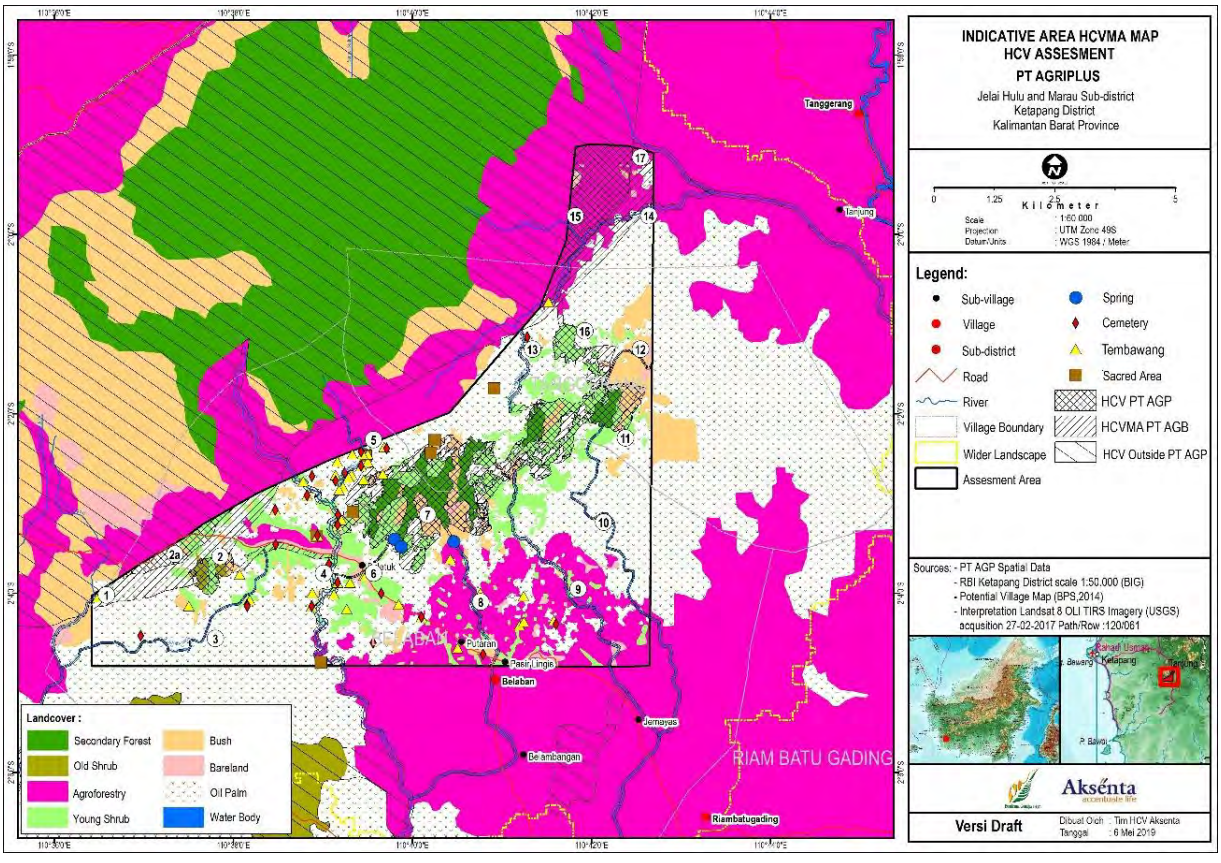
Map 25: Distribution of HCV 6 in the area of PT Agriplus

Total size of HCVA in PT AGRIPLUS Location Permit concession is 1,357.3 ha, accounting for 22.2% of the concession's total area. This is a combination of HCVA 1 to HCVA 6 sizes. Meanwhile total area of HCVMA in the PT AGRIPLUS Location Permit area is 1,974.5 ha or 32.3% of the area of the study area. In addition to covering HCV areas, the HCVMA also consists of: i) HCVMA No Go area in the form of hills and river borders whose land cover has been degraded, and ii) HCVMA Go Area is a buffer zone of HL Gunung Raya area (buffer zone width 500 m) with oil palm and mixed plantations owned by the community (**Map 26 and Map 27**). The area of the HCVMA No Go Area covers 1,612.6 ha while the area of the HCVMA Go Area covers 361.8 ha (**Table 31**)

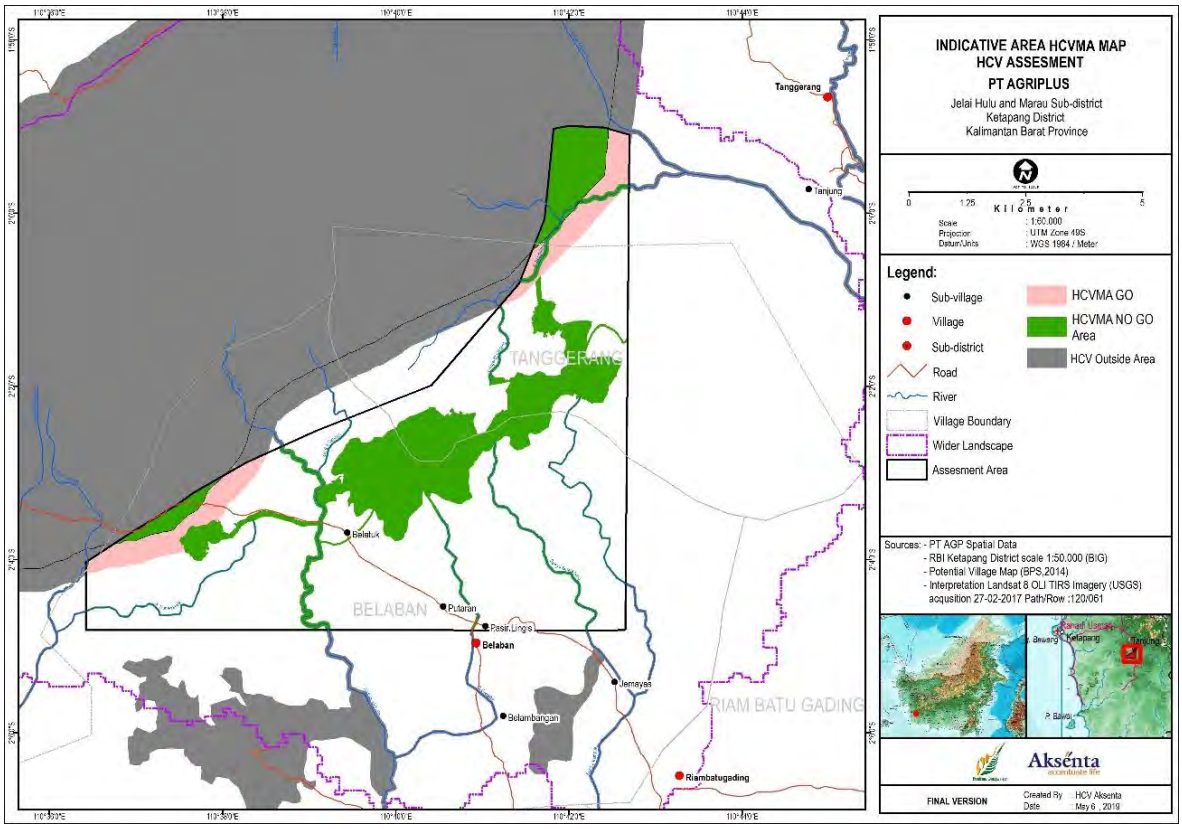
Table 31: Location and size of HCV Management Area (HCVMA) in PT Agriplus Location Permit concession

Index	Description	Area Size (ha)*	
		HCVMA 'No-Go' Areas	HCVMA 'Go' Areas
1	River Langsat and its riverbank (width: 30 m)	0.8	-
2	Shrub area on Kalanglampung – Semerumbung hills	45.3	-
2a	Area in overlap with Gunung Raya Protection Forest (buffer zone width of 500 m as HCVMA 'Go' Area)	64.0	190.5
3	River Sanawansik and its riverbank (width: 30 m)	22.7	-
4	River Air Putih and its riverbank (width: 50 m)	66.7	-
5	River Depatut and its riverbank (width: 30 m)	5.7	-
6	River Sementabang and its riverbank (width: 30 m)	8.4	-

Index	Description	Area Size (ha)*	
		HCVMA 'No-Go' Areas	HCVMA 'Go' Areas
7	Forested area on Limau Tupai – Sembelayang hills, including the presence of Senggraha, Riam Kekalap, and Unak Pulang springs (buffer width: 200 m)	840.2	-
8	River Sentabik and its riverbank (width: 30 m)	22.2	-
9	River Sengabang and its riverbank (width: 30 m)	34.6	-
10	River Kampak and its riverbank (width: 30 m)	25.1	-
11	Forested area on Betung hill	49.1	-
12	River Panyangkauan and its riverbank (width: 30 m)	11.5	-
13	River Bepinsang and its riverbank (width: 30 m)	12.3	-
14	River Sepupuan and its riverbank (width: 50 m); this area is also in overlap with Gunung Raya Protection Forest area	38.5	-
15	River Sejelemuan and its riverbank (width: 30 m); this area is also in overlap with Gunung Raya Protection Forest area	2.7	-
16	Thicket area on Batu Manunggul hill	31.3	-
17	Area in overlap with Gunung Raya Protection Forest (buffer zone width of 500 m as HCVMA 'Go' Area)	201.1	171.4
18	Sacred sites distributed in 7 locations	14.5	-
19	*Tembawangs* distributed in 42 locations	108.2	-
20	Burial grounds distributed in 24 locations	7.8	-
Total Size of HCVMA (ha)		1,612.6	361.8
			1,974.5
Size of PT AGRIPLUS Location Permit Concession (ha)**		6,109.6	6,109.6
Percentage of the HCVMA Size against the Location Permit Concession (%)		22.2	5.9



Map 26: Indicative area HCVMA di areal in PT Agriplus Location Permit Concession



Map 27: *HCVMA Go Area* dan *HCVMA No Go Area* in PT Agriplus Location Permit Concession

Stakeholders Consultation Result

Consultation with stakeholders is done through informal meetings and formal meetings. Consultation with stakeholders through informal meetings was carried out at all stages of the study, starting from the preparation / pre-assessment, field study, and in the process of preparing the report. This consultation was carried out using in-depth interviews, participatory mapping, discussion and field visits. Consultations with stakeholders through formal meetings are carried out through public consultations to deliver the results of the interim study (not the final result) with a presentation and discussion approach. Stakeholder input at the time of the consultation was included in the management and monitoring plan in this report. The public consultation activity was held on August 15, 2017.

During a public consultation, not all respondents interviewed in the field and those invited were able to attend the meeting for various reasons. Likewise with NGOs, when the field study was conducted, information was obtained that the NGO that had a program in the study area and its surroundings was the Palung Foundation. But for future management and monitoring of HCVs, it is recommended that companies work together with other NGOs (in the field of conservation). Nonetheless, the number of participants present represented the community in three villages in the study area, namely from Belaban Village, Riam Batu Gading (in Marau District) and Tangerang Village (in Jelai Hulu District). A summary of the results of stakeholder consultations on HCV studies is presented in Table 32.

Table 32: Summary of stakeholder consultation output

Name and Position/Role	Organisation or Social Group	Main Concern & Recommendation/Response from the HCV Assessment Team
Dahlan	Belaban Village Head	• The result of this HCV Assessment in PT AGP concession will be used for what purpose? This HCV Assessment is yet to be comprehensive. Many wildlife encounters are yet to be recorded, especially those that are migrating or moving to Gunung Raya Protection Forest. • Based on the assessment result, concerning HCV 6 elements, particularly sacred sites, ancient villages, and ritual sites in Belaban Village, is there any addition as to the potential HCVA 6 in village area? • In 2008 and 2009, PT AGP gradually cleared conducted lands and planted oil palm which have been confirmed to be located far from protection forest. However, in 2015, the seven-year-old planting area was included by the protection forest area, leading to removal of oil palm plants by the government because of regulation on new area. Based on this, can the community use the area for their own management? Team Response: - The HCV Assessment result make recommendation on HCVAs, and these areas should be protected and maintained together by the company and community for mutual benefit. - This HCV Assessment is yet to cover all aspects because our time is relatively limited. Therefore, inputs from this public consultation will enrich the data and strengthen the recommendation on the HCVA, including wildlife encounter in the Assessment Area. - Community cannot use the area as the company has asked, because the status of the area is protected forest. Protected forest is an air catchment area that must be maintained and preserved by both the company and the surrounding community. This will be included as an evaluation in HCV Management and Monitoring.
Hamjah	Community member who uses water from Riam Kekalap spring, Pasir Linggis Sub-Village, Belaban Village	Community that uses water from Riam Kekalap spring has made an agreement regarding prohibition of land clearing in the spring's upstream area, i.e. Bukit Sembelayang. Anyone who violates this agreement will be subject to customary fine. This agreement has also been provided under Village Regulation since 2012. Team Response: Local community's initiative to maintain river and spring will be included into HCV management plan recommendation, so that the management can be integrated into the existing management by local community.
Markus Singkuy	Community member of Belatuk Sub-Village, Belaban Village	Large-scaled land fires broke out in 1997/1998 and mid-2000s before PT AGP operated, these fires burnt most of the area. Team Response: This information will be used in land cover assessment.
Fardy Akmyarsyah	Agriculture, Animal Farming, and Plantation Office	• This public consultation is positive and part of the company's commitment to sustainable oil palm management, not only under RSPO scheme but also ISPO's. Team Response: This HCV Assessment requires public consultation, the implementation of which must be participatory and involve local community, especially when it relates to designation of HCV 5. In addition, public consultation also serves as means of discussion, consultation, and information dissemination on HCV presence.

Name and Position/Role	Organisation or Social Group	Main Concern & Recommendation/Response from the HCV Assessment Team
Edwardo Hungan	Settlement and Environmental Office	• This activity is positive because it is carried out in a participatory manner by involving not only local government, but also local community. • Environmental Impact Assessment (EIA) is available, as well as the Environmental Management Plan (RKL)/Environmental Monitoring Plan (RPL). However, the result of this assessment will enrich the company's EIA and Environmental Management and Monitoring Plan (RKL/RPL), so that the environmental management of this area will be more comprehensive. Team Response: - As explained previously mentioned, it is required to hold a public consultation in HCV assessment, the implementation of which must be participatory and involve local community, and in this stakeholder consultation, local community also attends this forum, together with the government and NGO. - EIA, as well as RKL/RPL, is one of the sources of information in this assessment, so that HCVA management is expected not to overlap with activities that are already carried out.
Ruswanto	Natural Resources Conservation Agency (BKSDA) of West Kalimantan Province	• Protected animals should not be hunted, e.g. northern grey gibbon and sun bear. • HCVA can be promoted to become essential ecosystem area. Currently, we already have minister regulation designating essential ecosystem areas in three districts, i.e. Ketapang, North Kayong, and Sekadau Districts. Team Response: - This input will be useful in preparing HCVA monitoring and management plan. - HCVA designation also considers connectivity of HCVA to the surrounding areas (national park, protection forest, essential ecosystem area).
Yoga	BKSDA of West Kalimantan	• Will the wildlife data presented in the HCV report document be the same as the one presented in the presentation slide (where wildlife is categorised by their conservation status)? • Is Proboscis monkey found in the Assessment Area? Team Response: - Presentation of animal data will be adjusted to the report's format, starting from global, domestic, and local issues. - According to the assessment result (field observation and interview with workers and local community), there is no record of Proboscis monkey presence in the Assessment Area. - Potential HCVAs, especially HCVA 3, are indeed unique and vulnerable ecosystems, such as forest on limestone (karst), peat forest, heath forest, and mangrove forest. However, in this assessment, the existing condition of PT AGP is mostly in the form of severely damaged heath forest that forms desert with very low biodiversity and environmental carrying capacity. Such damage is caused by the recurring forest and land fires and land clearing.

Name and Position/Role	Organisation or Social Group	Main Concern & Recommendation/Response from the HCV Assessment Team
Edward Tang	Palung Foundation	• The company is committed to managing HCVAs, including compensating the areas (land compensation/GRTT) so that they can be managed by the company. • It is recommended to establish a special division in company management that covers both the company and community's participations in establishing a team to monitor and manage biodiversity as part of HCVA management. Team response: - The company is obliged to manage and monitor HCVAs in its concession. - This has already been included in recommendation for HCV monitoring and management in the report.

Note:

- During public consultation, indicative HCV map is presented for confirmation, verification, and discussion.
- Stakeholder consultation is not meant to present the final result.
- Input from stakeholders have been included in the management and monitoring plan in this report

3.4 Carbon Stock Assessment (CSA) and High Carbon Stock (HCS)

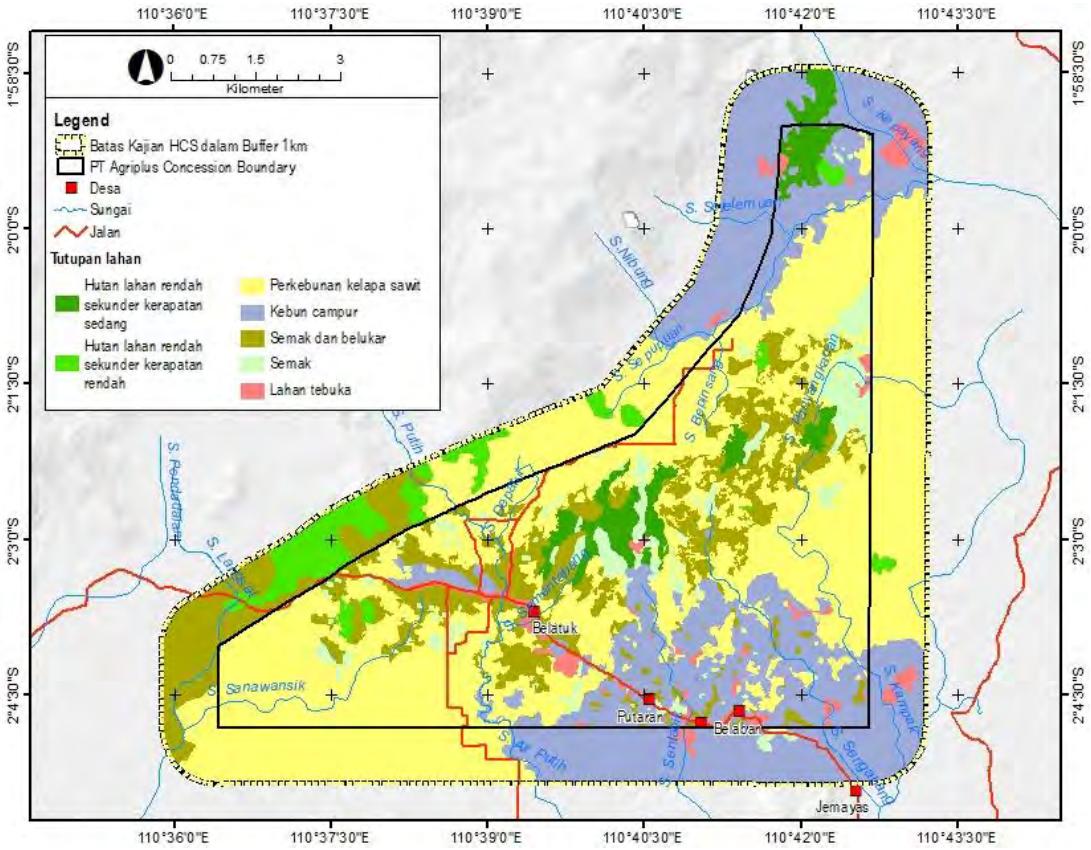
Initial studies focused on the land cover analysis, using the Landsat 8 OLI TIRS path/row 120/061 satellite imagery with the acquisition date of 27 February 2017, to determine the stratification of the vegetation cover, and it verified by the ground truthing. Land cover classification, as the basis for determining the number and the placement of sample plots - at the preparation stage - as well as the extrapolated value of carbon stocks - at the analysis stage -, refers to the classification of land cover SNI 7645 (National Standardization Agency, 2010), carried out through the interpretation of satellite imagery band 654 and band 543 is not guided by the classification method (unsupervised classification).

Table 33: Results of the interpretation of satellite data prior ground truthing

Land cover	Area**	
	(ha)	(%)
Secondary Forest (Hutan Sekunder)	205.1	3.4
Old Shrub (Belukar)	25.0	0.4
Agroforestry	1,185.7	19.4
Young Shrub (Semak Belukar)	987.1	16.2
Bush (Semak)	442.2	7.2
Oil Palm (Kelapa Sawit)	3,131.9	51.3
Bare Land Land (Lahan Terbuka)	132.5	2.2
Total	**6,109.6****	**100**

**)Source: the interpretation of Land Use Change Analysis, Full HCS Report, Aksenta 2017*

***) Area based comprehensive GIS (shp boundary PT AGRIPLUS)*



Map 28: Landcover Map of PT Agriplus, year 2017 at time of assessment

Table 34: Land cover categorization based on SNI and HCSA Toolkit version 1

No	Land Cover Class	Definition (SNI)	Land Cover Class HCS
HCS Class			
1	Medium-high density secondary lowland forest	Forests that grow and develop in dry land habitats in the form of lowland forests, have experienced human intervention. If the Density 41% -70%: medium Density > 70%: high	Low-Medium Density Forest (HKR, HKS)
2	Low density secondary lowland forest	Forests that grow and develop in dry land habitats in the form of lowland forests, have experienced human intervention. Density: 10% -40%.	Young Regenerating Forest (YRF)
Non-HCS Class			
3	Bush and shrubs	The vegetation formation or structure is a collection of shrubs with a height of between 50 cm to 2 m, which is dominated by woody vegetation, interspersed with very short trees with a height of <= 5 m. Or: Dry land areas that have been overgrown with a variety of heterogeneous and homogeneous natural vegetation with sparse to dense density. The area is dominated by low (natural) vegetation.	Shrub (S)
4	Mixed garden / agroforest	Dry land planted with perennials (trees) combined with annual crops. Perennial plants or trees are like fruit trees or other	Smallholder (SH)

No	Land Cover Class	Definition (SNI)	Land Cover Class HCS
		trees, while seasonal plants are like chilies and cassava.	
5	Oil Palm Plantation	The land is planted with oil palm plants in the form of a wide spread and a regular cropping pattern, which is industry-oriented	Agricultural plantation (AGRI)
6	Bush	The land cover is in the form of plants that grow naturally with an average height of less than 2 m but more than 50 cm, there are those that are not woody.	Bare Land
7	Bare Land	Natural / semi-natural open land: land without cover, both natural and semi-natural, whose existence is not the result of direct engineering by humans, but as a result, natural processes such as sedimentation. This class includes open land in land areas and coastal areas. Usually unconsolidated. Cultivated open land: open land which is usually a consolidated land, the result of human engineering and cultivated or utilized for certain purposes.	

Table 35: Simplified mention for each land cover

Strata	Land Cover Class
SF	Secondary Forest (Hutan Sekunder): - HKR, HKS
AF	Agroforestry (SH)
OS	Old Shrub (Belukar) - YRF
YS	Young Shrub (Semak belukar)
BS	Bushes (Semak); Bare Land (Lahan Terbuka);
OP	Oil Palm (AGRI) YoP: 2011, 2012,2014, 2015, 2016 & 2017

Above Ground Biomass (AGB)

The number and placement of sample plots sampled in the field is determined by the sampling method stratified random sample (stratified random sampling) representing each land cover classes derived from the interpretation of satellite images. The total number of plots are 65 plots, divided into 9 plots of Secondary Forest, 3 plots of Old Shrub, 15 plots of agroforestry, 28 plots of oil palm (8 plots on YoP 2011-2012, 12 plots on YoP 2014-2015, 6 plot on Yop 2016-2017), 7 plots of young shrub and 3 plots of bush. AGB measured in the field consists of plant organs which are located above ground level. Value biomass on the surface of each plot and stratum is the average value per unit area (ha) extrapolation of measurements at plot level.

Table 36: Estimated value of AGB plot level in the area of PT Agriplus, 2017

Strata	Above-ground biomass (ton/ha)					Uncertainty (CI-95%)(%)	Coefficient of Variation (%)
	Average	Minimum	Maximum	StDev	Std-error		
Sf	250.3	201.2	295.2	38.4	14.5	11.6	15.4
Af	168.3	104	231.8	40.6	12.2	14.5	24.1
Os	87.7	53.1	124.9	23.5	7.8	17.8	26.7
Ys	62.6	30.3	93.8	19.9	7	22.4	31.7

Bs	33.2	18.7	47.6	20.4	14.5	87.3	61.7
OP 2011-2013	68.1	62.5	70.8	2.9	1.0	3.0	4.3
OP 2014-2015	47.2	37.0	67.8	6.9	1.6	6.9	14.6
OP 2016-2017	23.3	18.4	28.2	4.0	1.6	13.8	16.9

Source: Analysis of primary data from Aksenta, 2017

Below Ground Biomass (BGB)

Below Ground Biomass (BGB) is a root biomass of a stand. Fitkau and Klinge studies (1973) show that the BGB value is 0.37 of the AGB value so that the Below Ground Biomass (BGB) value for each strata tend to have the same distribution as the Above Ground Biomass. The BGB value in this plot level is used to generate carbon stocks derived from BGB by utilizing the relationship between BGB and AGB at the plot level.

Table 37: Estimated value of BGB plot level in the area of PT Agriplus, 2017

Strata	Below-ground biomass (Mg/ha)					Uncertainty (CI-95%)(%)	Coefficient of Variation (%)
	Average	Minimum	Maximum	StDev	Std-error		
Sf	46.6	41	52.8	5	1.9	8.1	10.7
Af	31.4	21	39.2	6	1.8	11.5	19.1
Os	19.9	16	24.7	3.3	1.2	12.5	16.6
Ys	14.2	11.6	15.7	1.3	0.5	6.7	9.5
Bs	7.8	4.6	10.5	2.5	1.3	32.6	32.6
OP 2011-2013	14.5	13.4	15.0	0.5	0.2	2.7	3.8
OP 2014-2015	10.4	8.4	14.4	1.3	0.3	6.0	12.8
OP 2016-2017	5.6	4.5	6.6	0.8	0.3	12.2	15.0

Source: Analysis of primary data from Aksenta, 2017

Carbon Source of Necromassa; Woody Debris and Litters

The carbon source derived from necromassa in this study is grouped into two; (i) wood or dead trees (*woody debris*) dan (ii) litters. Necromassa of dead wood is calculated based on the volume of wood and its specific gravity according to its weathering rate. Necromassa from the litter is the result of weighing the dry weight of the samples taken in the field.

Table 38: Estimated value of Dead Wood Necromass plot level in the area of PT Agriplus, 2017

Strata	Dead Wood Necromass (Mg/ha)					Uncertainty (CI-95%)(%)	Coefficient of Variation (%)
	Average	Minimum	Maximum	StDev	Std-error		
Sf	1.1	0.3	1.9	0.8	0.5	81.7	70.8
Af	10.6	0.3	23.1	11.6	6.7	125.5	108.6
Os	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Ys	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bs	0.0	0.0	0.0	0.0	0.0	0.0	0.0
OP 2011-2013	4.4	2.3	5.5	1.3	0.4	17.6	29.2
OP 2014-2015	2.7	1.6	3.8	0.7	0.2	12.3	26.1
OP 2016-2017	1.7	1.0	2.8	0.6	0.2	25.3	35.7

Source: Analysis of primary data from Aksenta, 2017

Table 39: Estimated value of Litter Wood Necromass plot level in the area of PT Agriplus, 2017

Strata	Litter Necromass (Mg/ha)					Uncertainty (CI-95%)(%)	Coefficient of Variation (%)
	Average	Minimum	Maximum	StDev	Std-error		
Sf	2.3	1.2	5.2	1.3	0.4	36.7	55.0
Af	2.3	1.2	5.2	1.3	0.4	36.7	55.0
Os	1.3	0.5	1.7	0.7	0.4	60.6	52.6
Ys	4.0	0.6	7.5	2.1	0.8	40.4	53.4
Bs	0.7	0.3	1.2	0.5	0.3	81.9	70.9
OP 2011-2013	1.4	1.1	1.9	0.3	0.1	12.5	17.7
OP 2014-2015	1.4	0.6	3.3	0.8	0.2	25.5	54.2
OP 2016-2017	1.2	0.3	2.7	0.8	0.3	55.8	68.4

Source: Analysis of primary data from Aksenta, 2017

Soil Carbon Source

Based on desktop study using RePPProtc (1987) and groundtruthing analysis, there are 4 soil types in the area of PT Agriplus; *Typic Hapludult* (0,52%), *Typic Dystrudepts* (27,09%), *Typic Hapluhumults* (38,55%), *Typic Haplorthoxs* (33,84%).

Table 40: C-organic content (%) and Bulk density each land group association in the area of PT Agriplus

Soil Association*	Area		C-org (%)**	Bulk density (ton/m^3)**
	(ha)	(%)		
Hapluhumults	2380.8	38.5	1.7	1.4
Dystrudepts	1672.3	27.1	0.8	1.4
Hapludults	32.4	0.5	1.2	1.4
Haplorthox	2088.6	33.8	1.2	1.4
Total	6174.1	100		

*) Land System Map (RePPPRoT, 1987)
**)Refrensi Total Carbon and Nirogen in the soils of the world (Batjes, 1996)

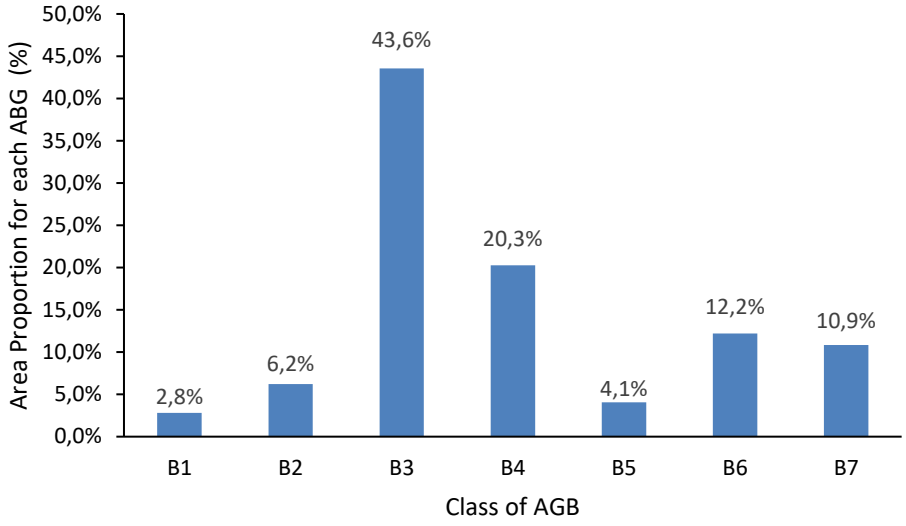
Area Classification According to AGB

The value of total carbon reserves in the study area is obtained by adding up the value of carbon biomass and soil carbon necromass value which is estimated based on the analysis of C-organic soil samples in the laboratory and in-depth review the soil map in the area of PT Agriplus.

In order to facilitate the mapping of the distribution of biomass values on the surface (AGB), the classification of the average value of biomass on the surface of a large union is carried out:

- B1 : Area with AGB 0-20 ton-C/ha
- B2 : Area with AGB 20-40 ton-C/ha
- B3 : Area with AGB 40-60 ton-C/ha
- B4 : Area with AGB 60-80 ton-C/ha
- B5 : Area with AGB 80-100 ton-C ha
- B6 : Area with AGB 100-150 ton-C/ha
- B7 : Area with AGB > 150 ton-C/ha

Classification of the value of AGB per unit area can give an idea of the condition of land cover. Some research results on carbon stocks from forest stand AGB show that the biomass value in the range B6-B7 is secondary forest, B3-B5 is shrub, B1-B2 is shrubs and bare land.

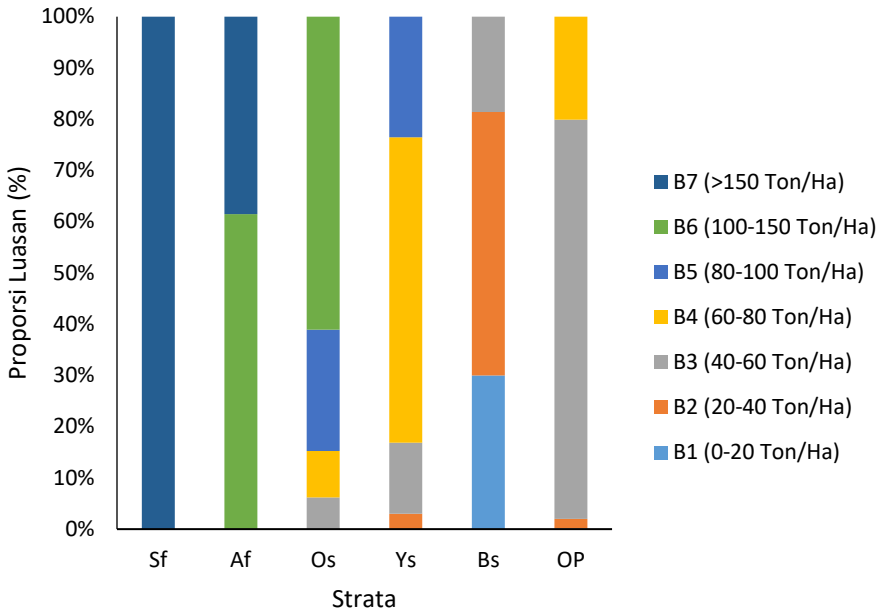


Graphic 2: Proportion of area according to biomass classification, PT Agriplus 2017

Table 41: The area according to the distribution of biomass classes in each strata of land cover, PT Agriplus 2017

Strata	Area by AGB Class (Ha)							Total (Ha)**
	B1	B2	B3	B4	B5	B6	B7	
Sf							206.4	206.4
Af						728.9	456.9	1185.7
Os			1.7	2.5	6.5	16.8		27.5
Ys		30.7	143.1	612.7	242.4			1028.9
Bs	168.7	289.2	104.7					562.6
OP	3.3	59.3	2412.5	623.4				3098.5
Total	172.0	379.2	2662.0	1238.5	248.9	745.6	663.3	6109.6

Source: Analysis of primary data from Aksenta, 2017

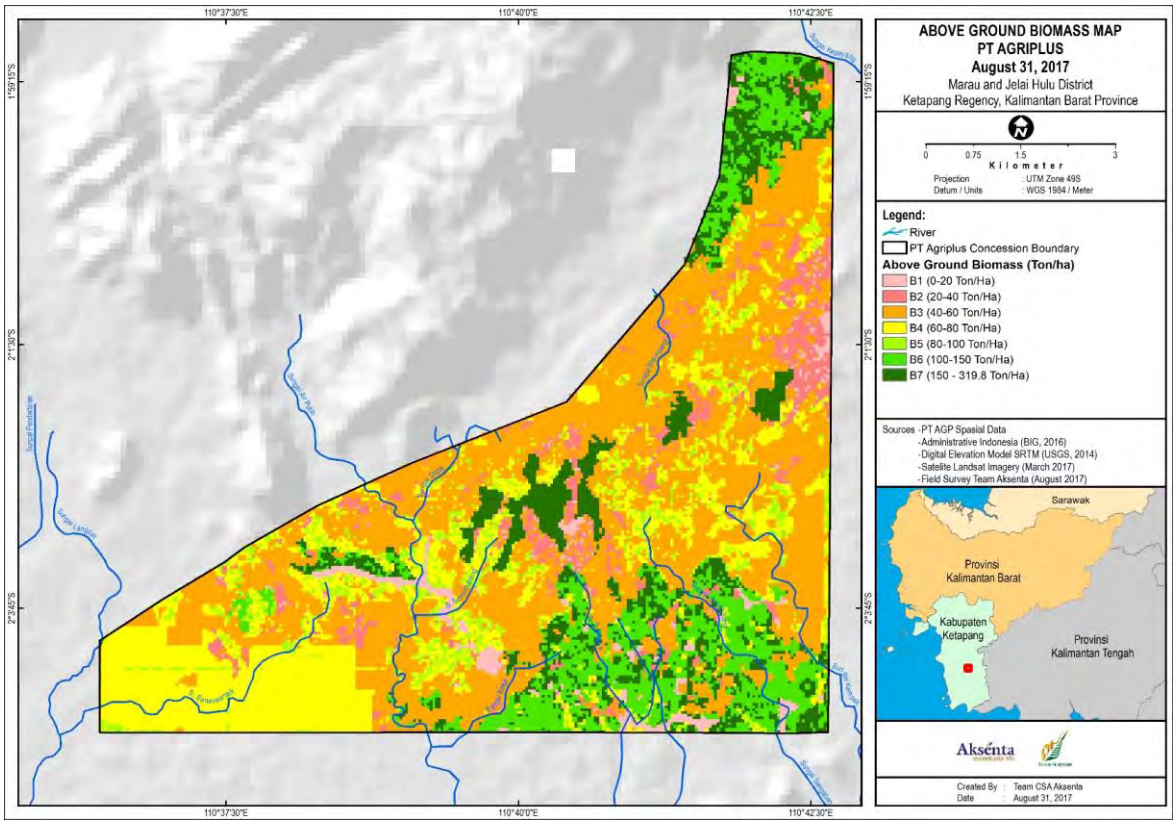


Graphic 3: Proportion of land cover strata to the biomass class, PT Agriplus

Table 42: The amount of AGB (kilo-ton) according to the division of AGB class in each stratum of land cover, PT Agriplus 2017

Strata	Biomassa total*) menurut kelas AGB (kilo ton)							Total (kilo ton)	Area (ha)	Average (ton/ha)
	B1	B2	B3	B4	B5	B6	B7			
Sf							56.2	56.2	206.4	272.4
Af						96.6	82.0	178.6	1185.7	150.7
Os			0.1	0.2	0.5	1.6		2.4	27.5	87.7
Ys		1.0	7.0	41.5	20.0			69.5	1028.9	67.6
Bs	0.7	8.9	4.7					14.3	562.6	25.4
OP										
2011-2013				37.9				37.9	622.8	60.9
2014-2015		0.2	103.5					103.7	2421.3	42.8
2016-2017	0.0	1.1						1.1	54.3	20.9
Total	0.8	11.2	115.3	79.6	20.5	98.3	138.2	463.9	6109.6	

Source: Analysis of primary data from Aksenta, 2017



Map 29: Distribution of Above Ground Biomass in the area of PT Agriplus, 2017

Recapitulation of Carbon Stock

i. Carbon Pools

Table 43: Summary of carbon source assessment at plot level in the study area, 2017

Carbon Sourced		Average (ton-C/ha)	Standard error (ton-C/ha)	Information
1	Above ground biomass (AGB) :			
	Sf	117.6	6.8	
	Af	79.1	5.7	
	OS	41.2	3.7	
	Ys	29.4	3.3	Tree biomass and carbon stocks with DBH <2 cm diameter, liana, terna and herbs (understorey plants) using destructive samples
	Bs	15.6	6.8	
	Op	25.2	1.1	
2	Below ground biomass (BGB) :			
	Sf	21.9	0.9	Using the value of the ratio of roots to aboveground biomass (RSR - Root Shoot Ratio) and to the value of dry weight results of laboratory analysis
	Af	14.8	0.8	
	Os	9.8	0.6	
	Ys	6.7	0.2	

Carbon Sourced		Average (ton-C/ha)	Standard error (ton-C/ha)	Information
	Bs	3.7	0.6	
	Op	5.5	0.2	
3	Necromass of woody debris			
	Sf	0.5	0.2	Carbon stock of trees and dead wood is calculated using the allometric equations of species that have been corrected with their weathering levels
	Af	5	3.1	
	Os	-	-	
	Ys	-	-	
	Bs	-	-	
	Op	0.6	0.1	
4	*Necromass of Litters*:			
	Sf	1.1	0.2	Carbon reserves are calculated based on the dry weight value of samples from laboratory analysis
	Af	1.1	0.2	
	Os	0.6	0.2	
	Ys	1.9	0.4	
	Bs	0.3	0.1	
	Op	0.7	0.1	
5	*Soil Carbon*			
	Haplorthox	32.2		Soil carbon reserves are calculated based on the value of C-organics contained in the soil up to a depth of 60cm for mineral soils
	Dystrudepts	18.1		
	Hapluhumults	54.4		
	Hapludults	0.5		

Source: Analysis of primary data from Aksenta, 2017

ii. Carbon Stock by Above Ground Biomass

Carbon reserves originating from AGB are calculated based on the results of the mapping of biomass (tons / ha) with Carbon Fraction (CF) of 0.47. In this study, the biomass data used is the result of extrapolation for the entire PT AGRIPLUS area. In order to facilitate the discussion and mapping of the total biomass carbon stock, in this study the total biomass carbon stock is grouped into seven:

- BC1 : Reserve carbon biomass < 20 ton-C/ha
- BC2 : Reserve carbon biomass 20-40 ton-C/ha
- BC3 : Reserve carbon biomass 40-60 ton-C/ha
- BC4 : Reserve carbon biomass 60-80 ton-C/ha
- BC5 : Reserve carbon biomass 80-100 ton-C/ha
- BC6 : Reserve carbon biomass 100-120 ton-C/ha
- BC7 : Reserve carbon biomass > 120 ton-C/ha

Table 44: Above Ground Biomass carbon stocks, regional level and its classification for any land cover classes at PT Agriplus, 2017

Strata	Above Ground Biomass Carbon (Kilo Ton-C)							Total	Area (Ha)	Average (Ton-C/ha)
	BC1	BC2	BC3	BC4	BC5	BC6	BC7			
Sf					1.3	25.0	0.1	26.4	206.4	45.9
Af			13.4	38.0	32.5	0.1		84.0	1185.7	35.5
Os		0.2	1.0					1.1	27.5	15.6
Ys	0.8	27.5	4.3					32.7	1028.9	2.1
Bs	5.3	1.4						6.7	562.6	
OP 2011-2013		17.8						17.8	622.8	40.1
OP 2014-2015	2.9	45.8						48.7	2421.3	27.6
OP 2016-2017	0.5							0.5	54.3	27.3
Total	9.6	92.8	18.7	38.0	33.8	25.1	0.1	218.0	6109.6	26.6
Area (Ha)	780.6	3810.0	379.3	555.0	391.1	192.9	0.7			
Average (Ton/Ha)	12.3	24.4	49.2	68.4	86.5	130.0	149.7			

Table 45: The area according to the classification of AGB carbon stocks in reginal level for each strata of land cover at PT Agriplus, 2017

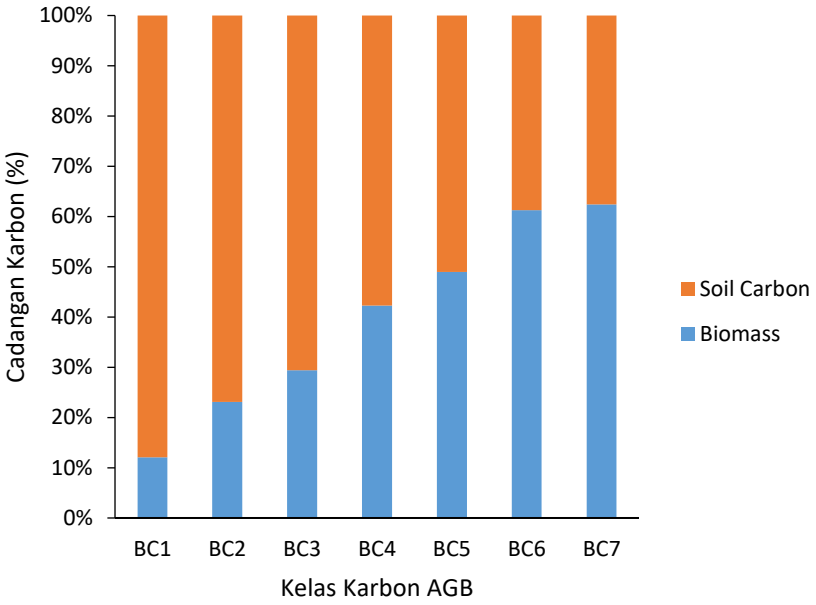
Strata	Total Area of AboveGroun Biomass (Kilo Ton-C)							Total
	BC1	BC2	BC3	BC4	BC5	BC6	BC7	
Sf					13.4	192.4	0.7	206.4
Af			252.5	555.0	377.7	0.5		1185.7
Os		5.7	21.8					27.5
Ys	50.2	873.7	105.0					1028.9
Bs	497.9	64.7						562.6
OP	232.5	2866.0						3098.5
Total (Ha)	780.6	3810.0	379.3	555.0	391.1	192.9	0.7	6109.6
Total (%)	13	62	6	9	6	3	0	100

The grand total of carbon stock in the are of PT Agriplus is 909.5 Kilo Ton-C, with average per unit area 148.9 Ton-C/ha. Soil carbon contributes up to 70.7% of total carbon (642.8 Kilo Ton-C), which the biggest carbon stock consisting of Tropodults,Paleudults, and Tropohumults: 332.4 kilo ton-C with average oer unit area is 54.4 ton-C/ha. Carbon stocks sourced from biomass contributed 29.3% of the total carbon reserves consisting of AGB (24%) and BGB (5.3%).

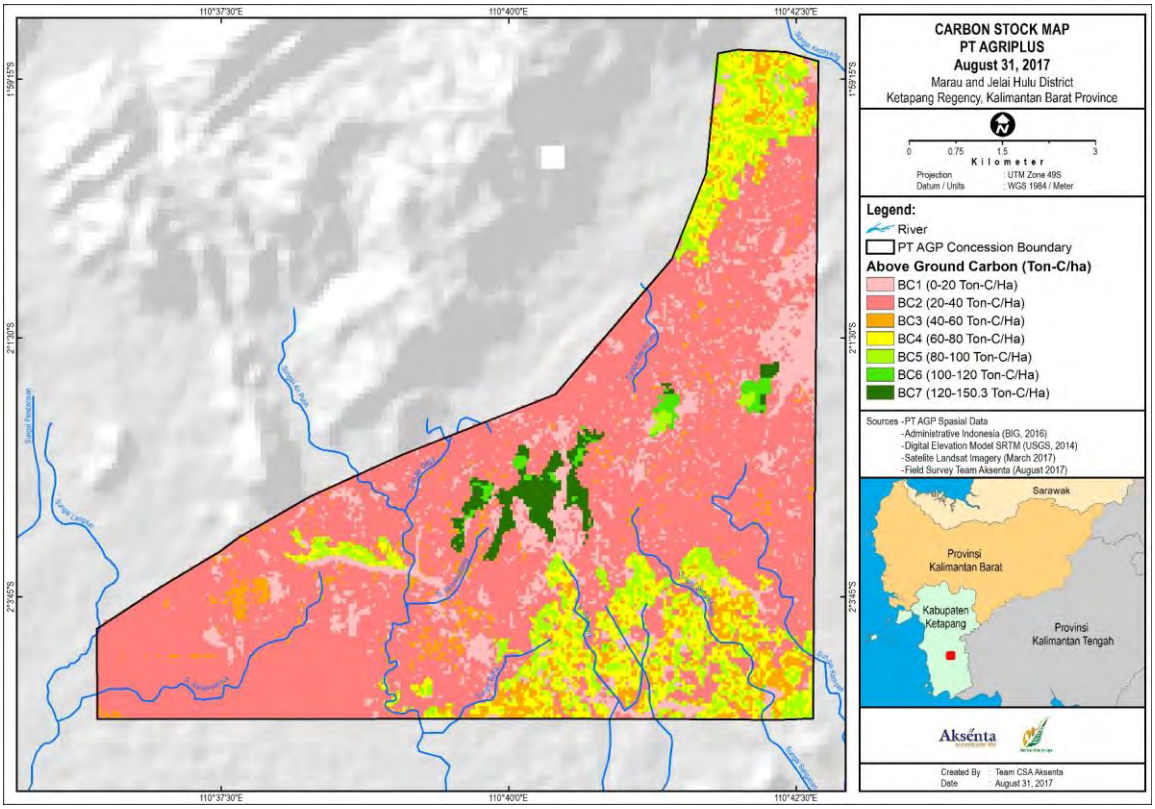
Table 46: Recapitulation of Carbon Stock in regional level, PT Agriplus 2017

Carbon Source	Total of Carbon Stock (Kilo Ton-C)							Total (Kilo Ton-C)	Rata-rata (Ton-C/ha)
	BC1	BC2	BC3	BC4	BC5	BC6	BC7		
Biomassa	9.6	118.2	23.6	45.4	40.2	29.6	0.1	266.7	43.7
Necromass	n/d								
Dystropepts; Tropudults; Haplorthox	34.3	116.2	9.5	10.1	9.2	17.3	0.1	196.6	32.2

Tropudults, Paleudults, Tropaquepts	7.4	76.4	9.7	9.8	7.4	0.0		110.7	18.1
Tropudults, Paleudults, Tropohumults	28.1	200.4	37.1	41.1	24.3	1.4	0.0	332.4	54.4
Tropudults; Dystropepts	0.2	0.7	0.2	1.0	1.0			3.1	0.5
Total (Kilo Ton-C)	79.5	511.9	80.1	107.3	82.1	48.3	0.2	909.5	148.9
Area (Ha)	823.1	3639.0	406.5	604.4	425.9	209.8	0.8	6109.6	



Graphic 4: Proportion of carbon stock based on carbon source



Map 30: Distribution Map of Carbon Stock (AGB) in the area of PT Agriplus, 2017

Patch Analysis

Phase 1: Mapping Gardenland with Participatory Mapping, HCV Areas and Peat

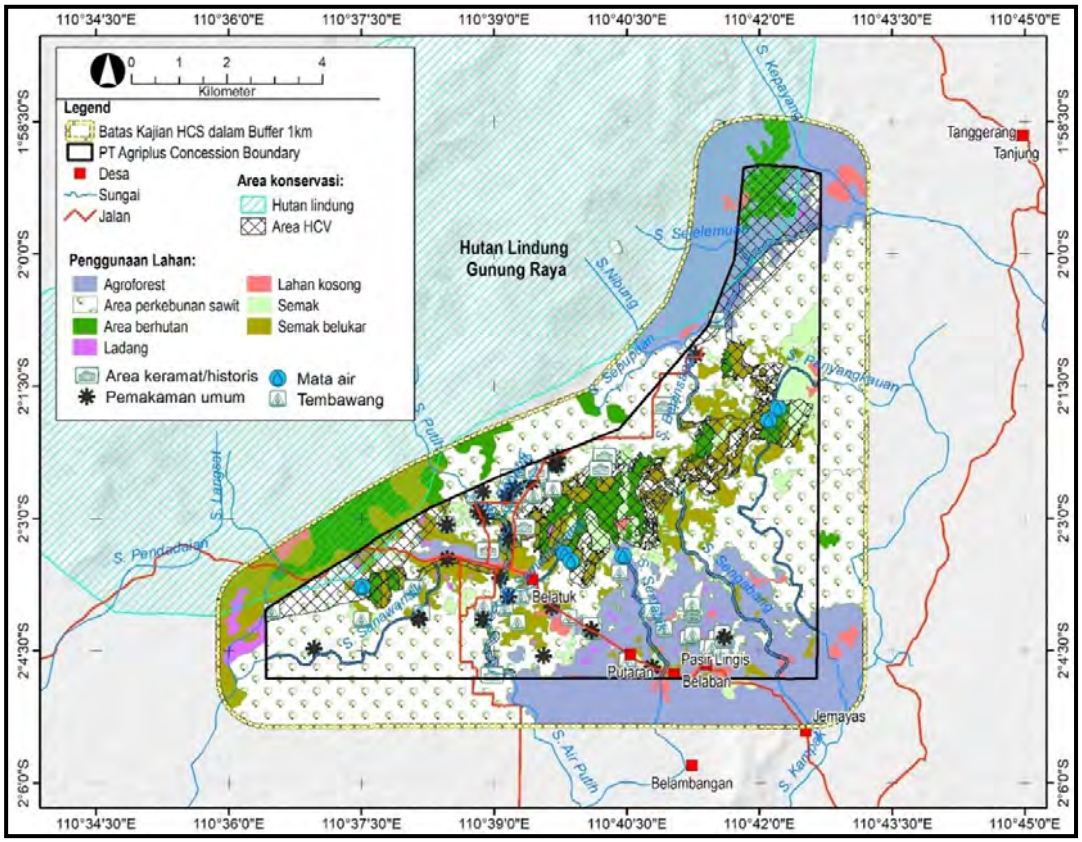
Based on the results of participatory mapping and community FPIC, it is known that all land that will be released by the community for the company's plan except for the sacred area, public cemetery, and tembawang with a total area of 130.5 ha, where all of these areas have been designated as HCV 5 and HCV 6. All areas within the study area other than those previously mentioned were approved by the community to be submitted for the company's oil palm plantation development plan in the study area. HCV Area and Map please refer to Map 2.

An examination of the presence of peat land using global data from the Peat Hydrological Unit (KHG) issued by the Ministry of Environment and Forestry in 2017 shows that, there is no peat area found within the PT AGP IUP area, the nearest peat area is 30-40 km from the study location. Soil type at the area of PT Agriplus please refer to Map 30.

Table 47: Recapitulation of the results of stage 1 analysis

No.	Description	Area	
		(ha)	%
1	IUP (Permit of PT Agriplus)	6,109.5	100
2	HCV Area	1,974.5	32.8
3	Potential of HCS Area*	340.8	5.6
4	Gardenland*	130.5	2.1
5	Peat	0	0
6	Palm oil	3,131.9	51.3
7	Potential of Development	1,003.1	16.4

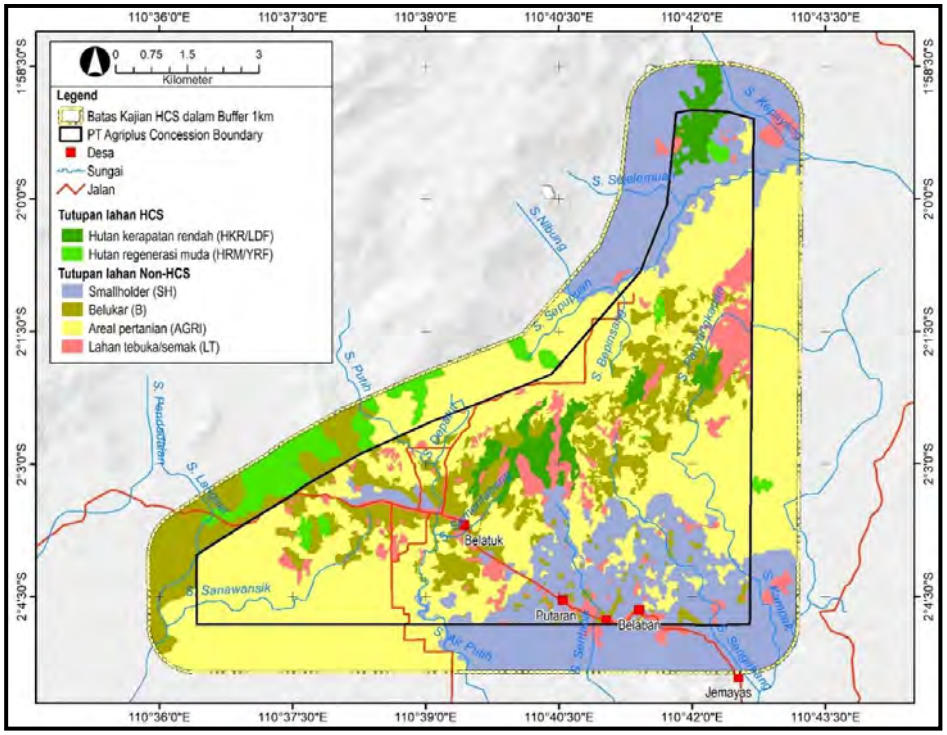
*Both of these areas are included in the HCV Area



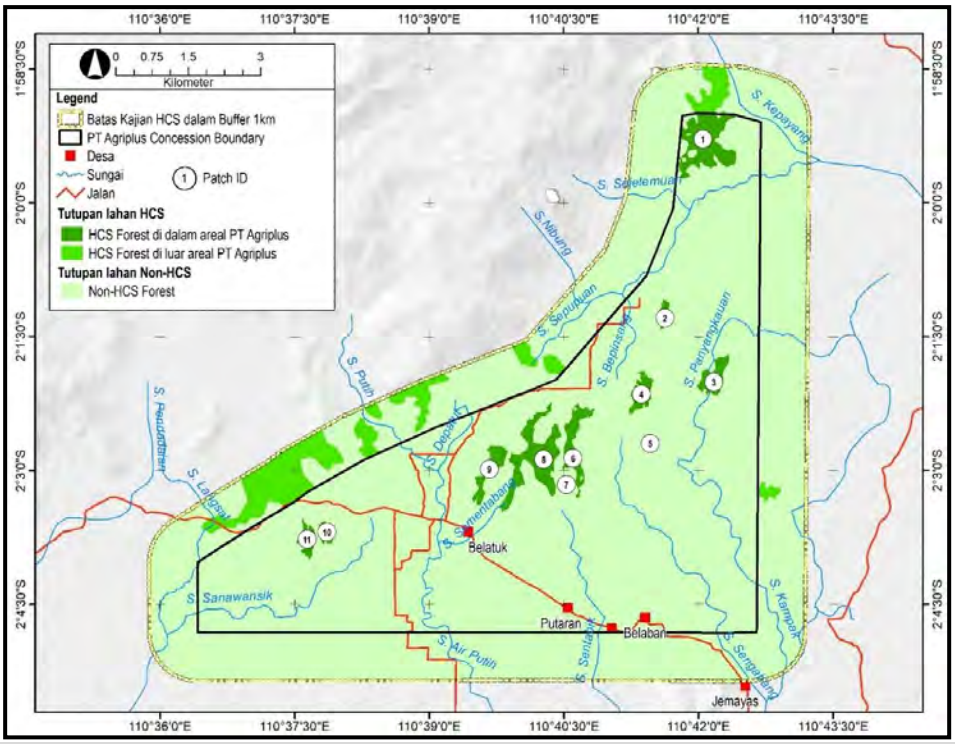
Map 31: Potential area for the development plan

Phase 2: Combining All Potential HCS Land Covers

Based on land cover class, it is known that there is a potential HCS area consisting of Low Density Forest/HKR and Young Regeneration Forest/HRM in the study location. The area of potential HCS is 340.8 ha (5.6%). The area is in the hills and is divided into twelve (12) distinct patches. Apart from within the study location, potential areas for HCS in the form of HRM were also found outside the study location. This area is located to the north of the study site and is part of a stretch of protected forest and is fragmented to the west and east within the scope of the study landscape.



Map 32: Categorization of land cover by land cover class HCS



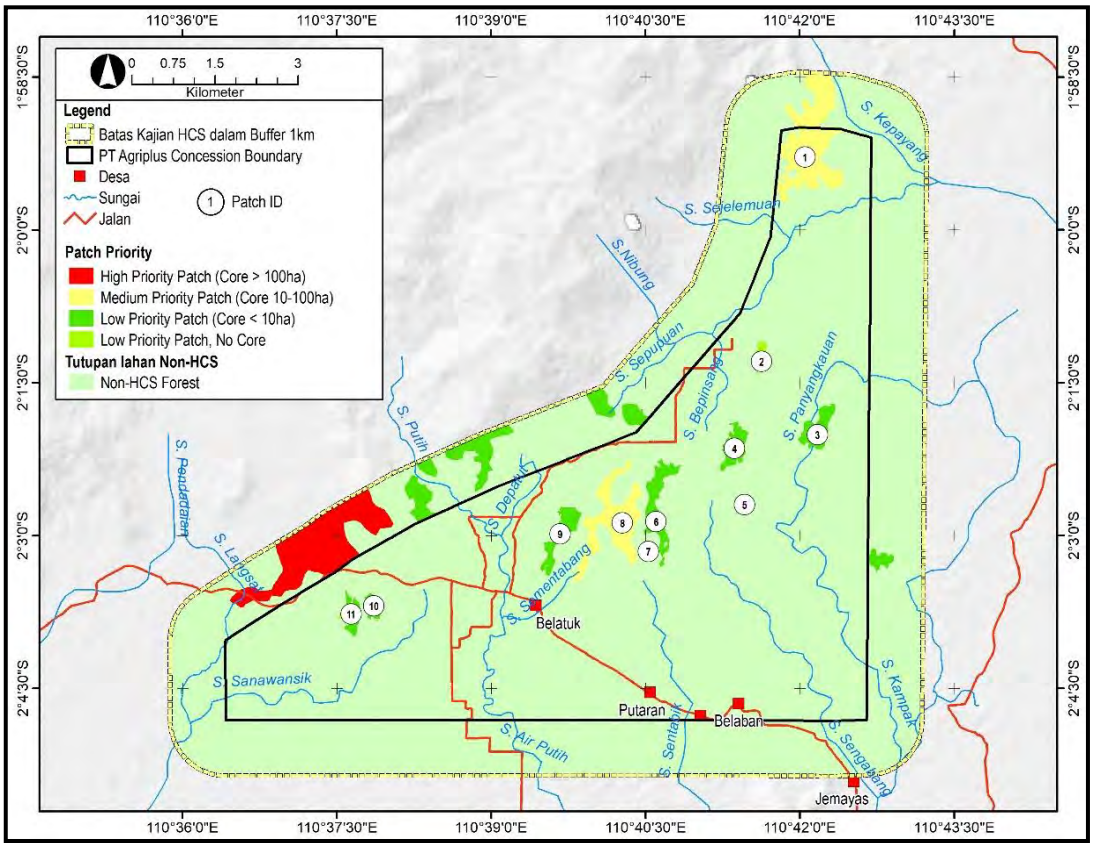
Map 33: HCS Land Cover

Phase 3: HCS Patch Potential Priority Categorization Based on Core Area

The twelve HCS patches at the study site consisted of two Medium Priority Patches (MPP) and ten Low Priority Patches (LPP). All HCS patches in the study area are part of a wider stretch of HCV area. Despite having a core area of <100 ha, these HCS patches are classified as high priority for conservation because they are fully integrated with the HCV area. The classification of HCS patches at the study site into high priority is based on the consideration of connectivity with a wider and more compact expanse of conservation areas, therefore pre-RBA and RBA are not necessary. At this stage the indicative HCS conservation area is 340.8 ha.

Table 48: Patch analysis results inside and outside the study site

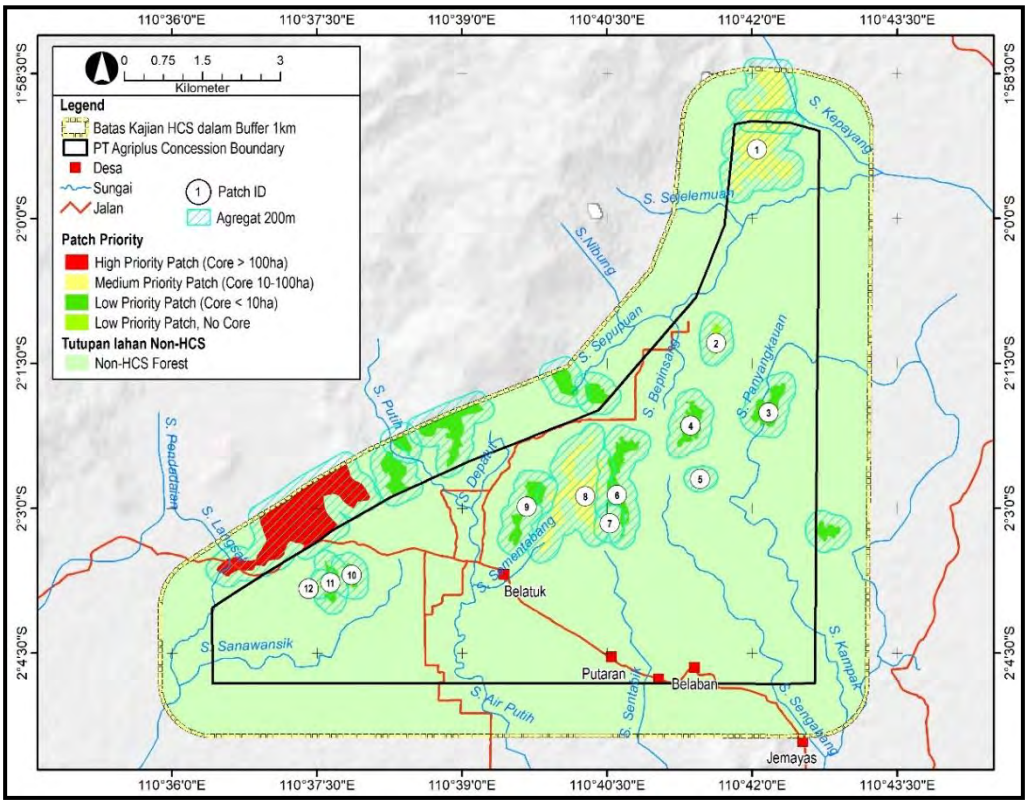
Inside the Study Location				
Patch ID	**Core Class**	**Priority Class**	**Patch Area**	**Core Area**
1	Core 10-100ha	Mediup Priority	91.0	47.5
2	No Core	Low Priority	9.0	0.0
3	Core < 10ha	Low Priority	26.7	4.0
4	Core < 10ha	Low Priority	23.6	2.8
5	No Core	Low Priority	0.9	0.0
6	Core < 10ha	Low Priority	41.1	2.6
7	No Core	Low Priority	4.3	0.0
8	Core 10-100ha	Mediup Priority	89.9	19.1
9	Core < 10ha	Low Priority	29.4	2.5
10	Core < 10ha	Low Priority	9.4	0.4
11	Core < 10ha	Low Priority	14.5	0.2
12	No Core	Low Priority	1.1	0.0
Outside the Study Location				
Patch ID	**Core Class**	**Priority Class**	**Patch Area**	**Core Area**
Outside	Core < 10ha	Low Priority	10.4	0.0
Outside	Core < 10ha	Low Priority	8.2	0.5
Outside	Core < 10ha	Low Priority	13.5	2.5
Outside	Core < 10ha	Low Priority	16.5	2.9
Outside	Core < 10ha	Low Priority	25.0	4.2
Outside	Core < 10ha	Low Priority	42.8	4.7
Outside connected to patch no 1	Core 10-100ha	Medium Priority	51.9	47.5
Outside	Core > 100ha	High Priority	192.5	105.8



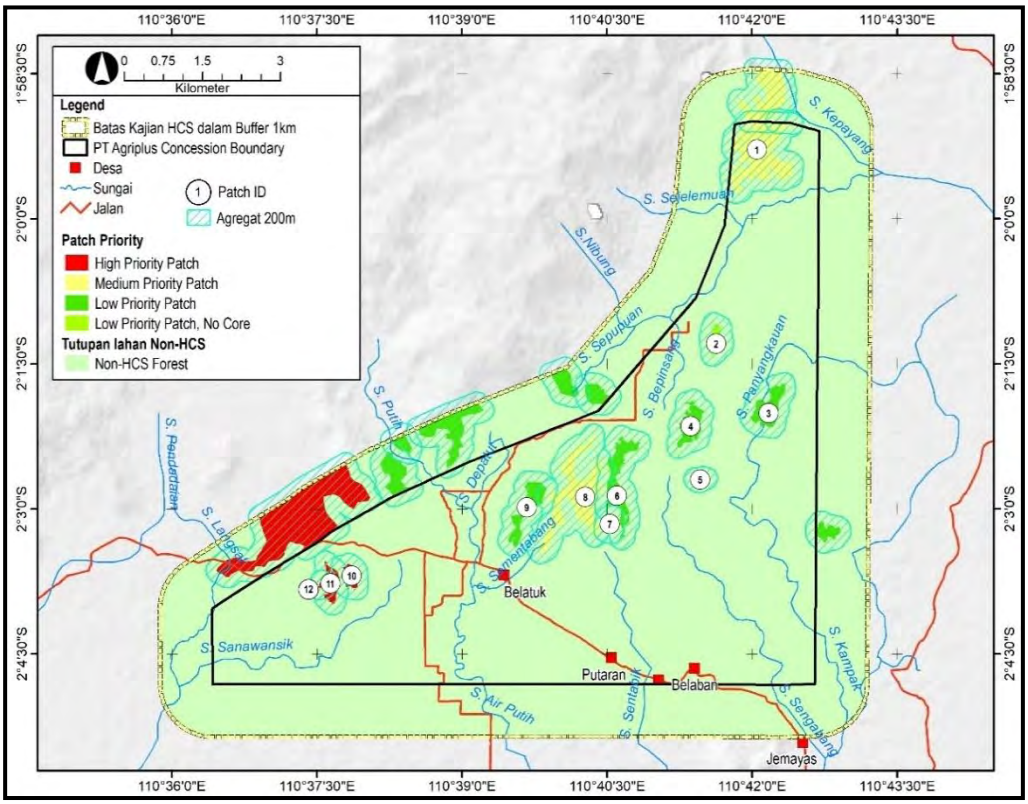
Map 34: HCS Patch at the study area

Phase 4 & 5: Connecting high priority patches (HPP) to each other; then Connecting medium priority patch (MPP) and low priority patch (LPP) to high priority patch

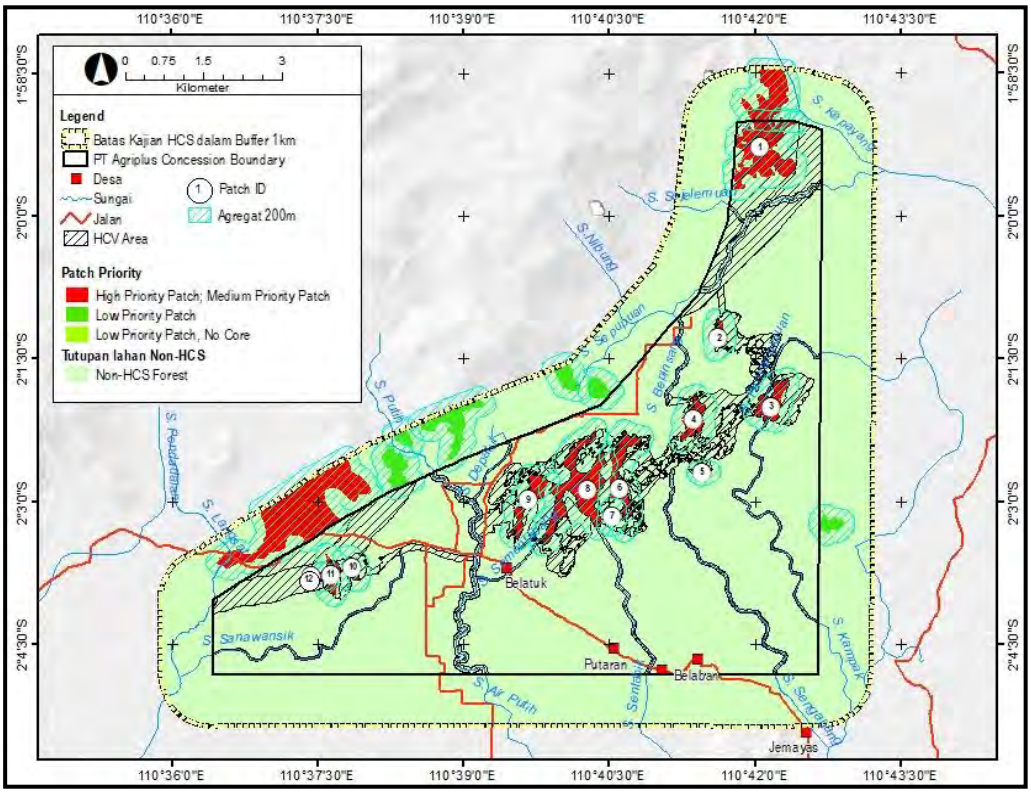
There is no high priority patch (HPP) in the study location, however, based on the aggregate analysis there are LPP patch areas with patch ID numbers 10, 11, 12 connected to an aggregate of 200 m with HPP within the scope of AOI, so these three forest patches change priority become HPP. In addition to being connected to HPP, these three patches have also been designated as HCV conservation areas. The other eight LPPs are located within/overlapping the HCV area, this also causes the eight LPP forest patches to become HPPs. Changes in forest patch priority are presented in Map 34-36.



Map 35: Aggregate analysis of LPP, MPP with HPP at the area of PT Agriplus



Map 36: LPP with Patch ID 10, 11, 12 connected to HPP, categorized as HPP



Map 37: LPP and MPP that are in the HCV polygon or are directly connected to the HCV area are HPP

Phase 6 & 7: Separate MPP and LPP and conduct risk assessment on MPP

These two stages are not carried out, because all medium priority patches and low priority patches have become high priority patches in the previous stage. Changes to priority patches occur on ID 10, 11, 12 because they are connected to HPP and HCV areas, while all remaining patches incorporated into the HCV area polygon have also been designated as HCV areas.

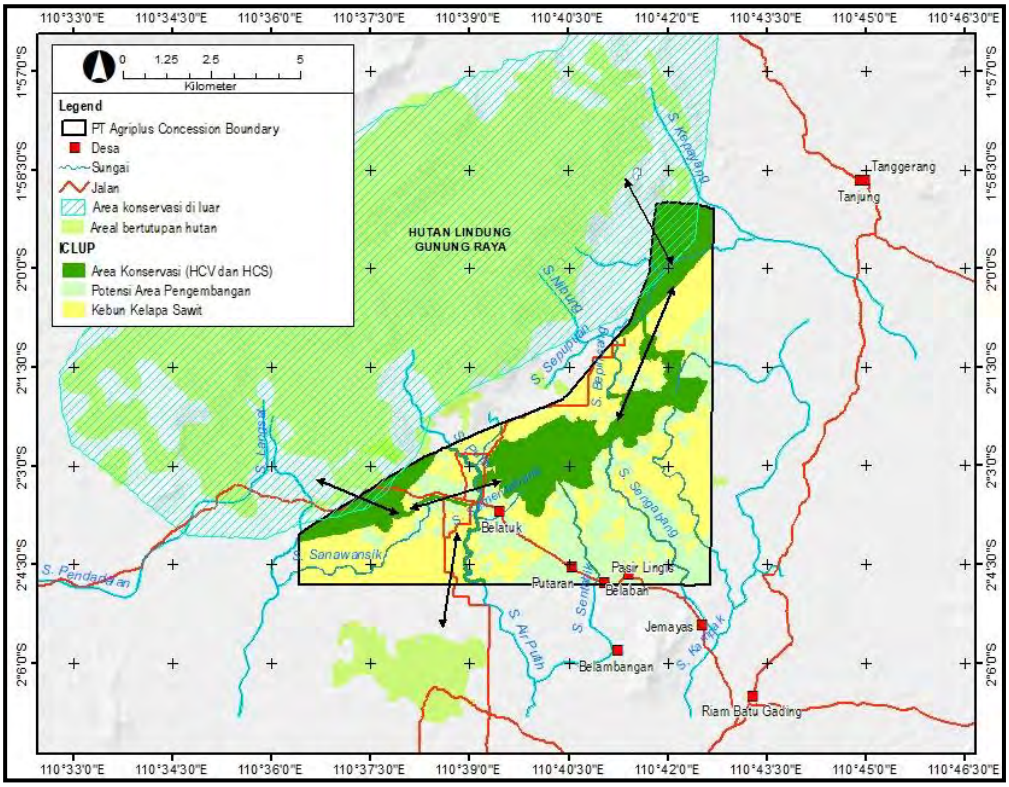
Phase 8, 9, & 10: Mitigating risks to conservation areas and conducting pre-RBA on par with RBA

No risk analysis was carried out on MPP because it was categorized as HCV. The classification of HCS patches at the study site into high priority is based on the consideration of connectivity with a wider and more compact expanse of conservation areas. MPP and LPP areas in the study area have been designated as HCV areas through field verification, therefore pre-RBA and RBA are not necessary.

Phase 11 & 12: Land Use Planning and adjustments to the boundaries of the conservation area

The integrated HCV and HCS conservation area at the study site forms a corridor connecting forest-covered areas in the Gunung Raya Protection Forest Area to the north of the study location with the conservation area within the study site. These corridors include riverbanks, hills, and areas important for community culture.

Based on the results of participatory mapping and community FPIC, it is known that there is no land that is not released by the community for the company's plans. All areas within the study area were approved by the community to be submitted for the company's oil palm plantation development plan in the study area.



Map 38: Conservation area connectivity in landscape context

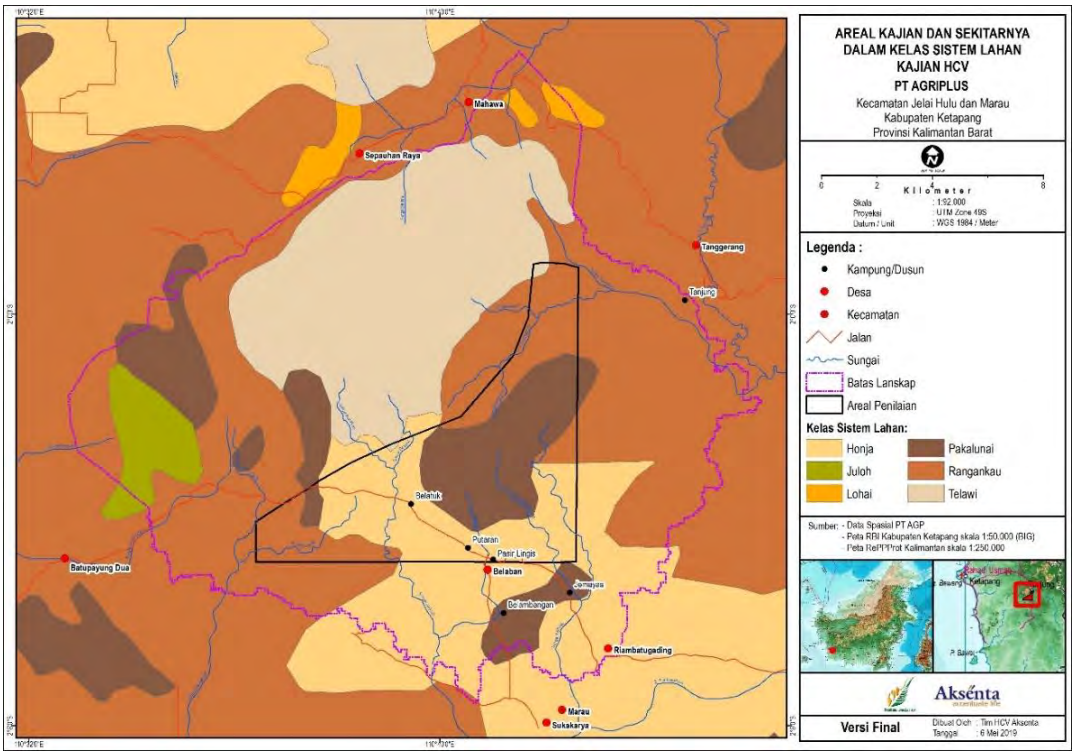
Conclusion:

- Total Carbon Stock from all of carbon source in the area PT Agriplus is 909.5 kilo ton-C with average per unit area 148.9 ton-C/ha. It comes from Soil C-organic (67.9%) and Biomass (32.1%).
- Most of the biomass carbon stock comes from oil palm plants, which is about 51.3% of the total biomass carbon stock.
- The average biomass carbon stock was 41.5 tonnes-C / ha with the largest amount sourced from oil palm cover (31.4 tonnes-C / ha).
- All the area which are not yet planted in PT Agriplus have the potential for the oil palm development. No community has decided not to give up their land for the company's plan.
- There are twelve HCS patches consisting of 2 medium priority patch areas and 10 low priority patch areas at PT Agriplus. Both of patches are separated and have no connectivity between them nor with HCS area outside PT Agriplus.
- Low priority patches with IDs 10, 11, and 12 are connected through aggregate analysis with HPP, so that they become HPP.
- The twelve patches are located within the HCV area, where the total area of HCS patches in the study area is 340.8 ha (5.6%).
- Total conservation area at PT Agriplus is 1,974.5 ha (32.8%). The rest are oil palm plantation with an area of 3,131.9 ha (51.3 %).

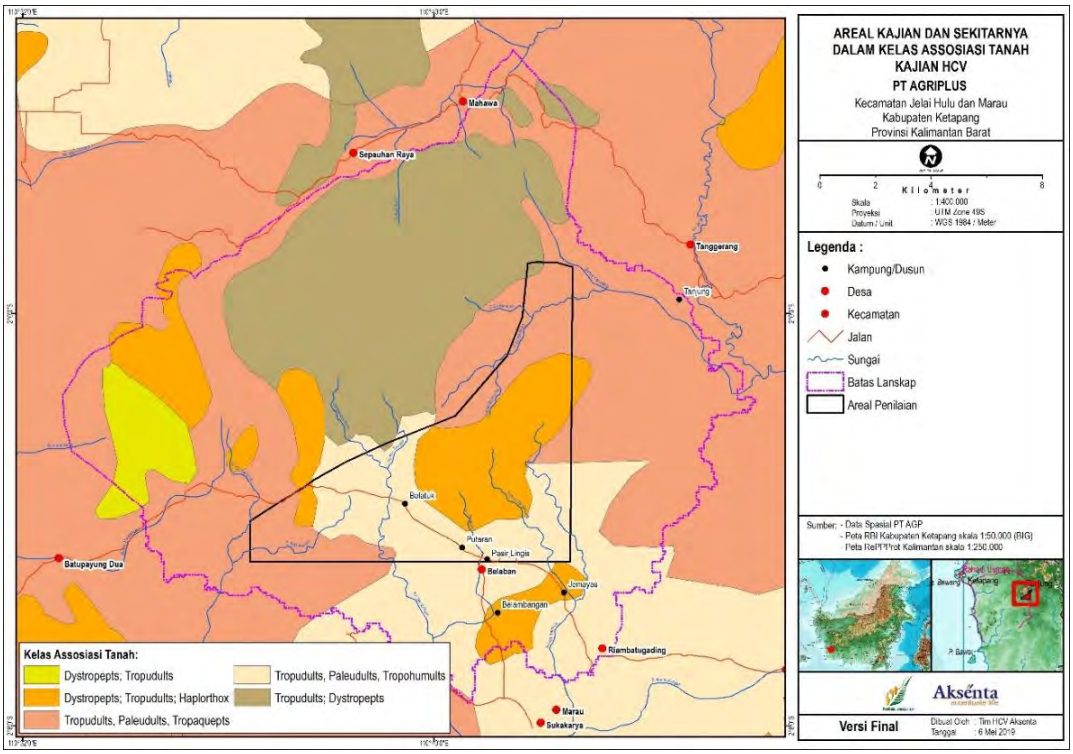
3.5 Soil & Topography

Soil types in the study area consist of four soil associations (Figure 14; RePPProT, 1990), namely: (i) dystropepts, tropudults, and haplorthox; (ii) tropudults, paleudults, and tropaquepts; (iii) tropodults, paleudults, and tropohumults; and (iv) tropudults and dystropepts. From the soil association, there is no land that is included in the category of marginal soil or fragile soil. Tropudults are the dominant soil type and occur in every soil association. This type of soil is soil in hot and humid areas that has developed further, has a fine texture, is sensitive to erosion, and reacts with acid.

According to literature, mineral soils in valleys or undulating plains of the PT AGRIPLUS IUP area have an average density of 1.41 tonnes / m3 and have a dusty clay texture with a dark red color with a solum depth> 120 cm. Soil types for hilly landscapes have a smaller average specific gravity value of 1.36 ton / m3 with a sandy clay clay texture with a solum depth of 0-80 cm.



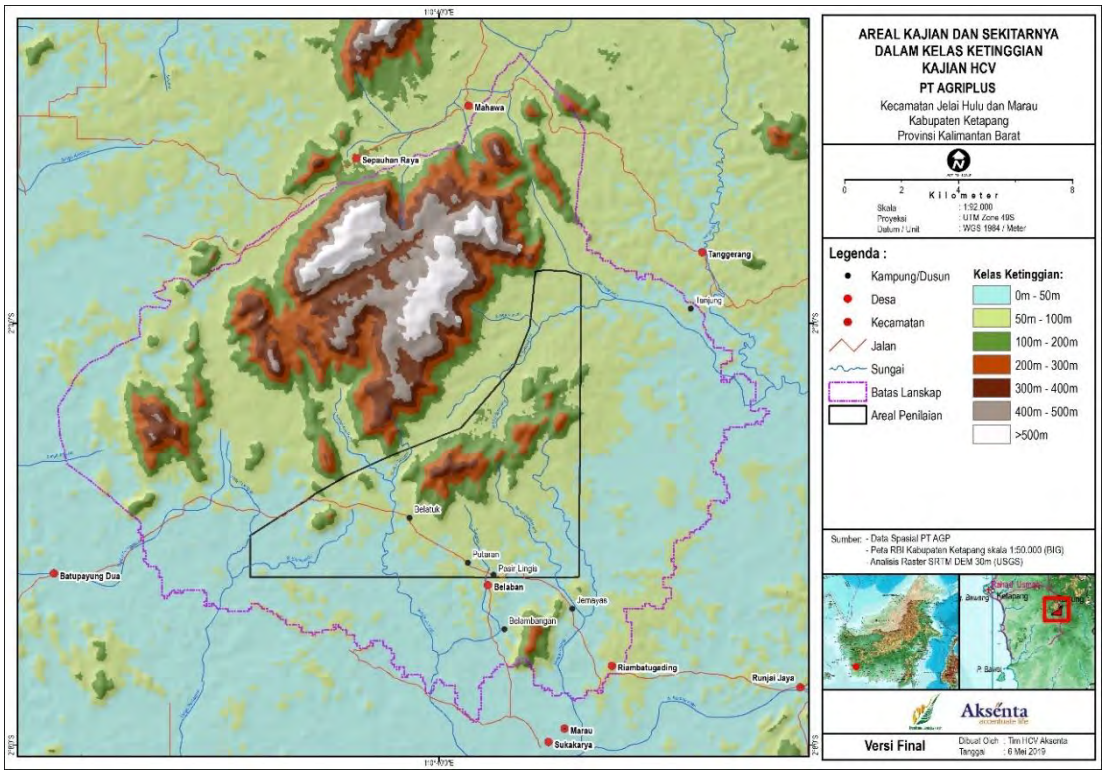
Map 39: Land system in the study area and its surroundings



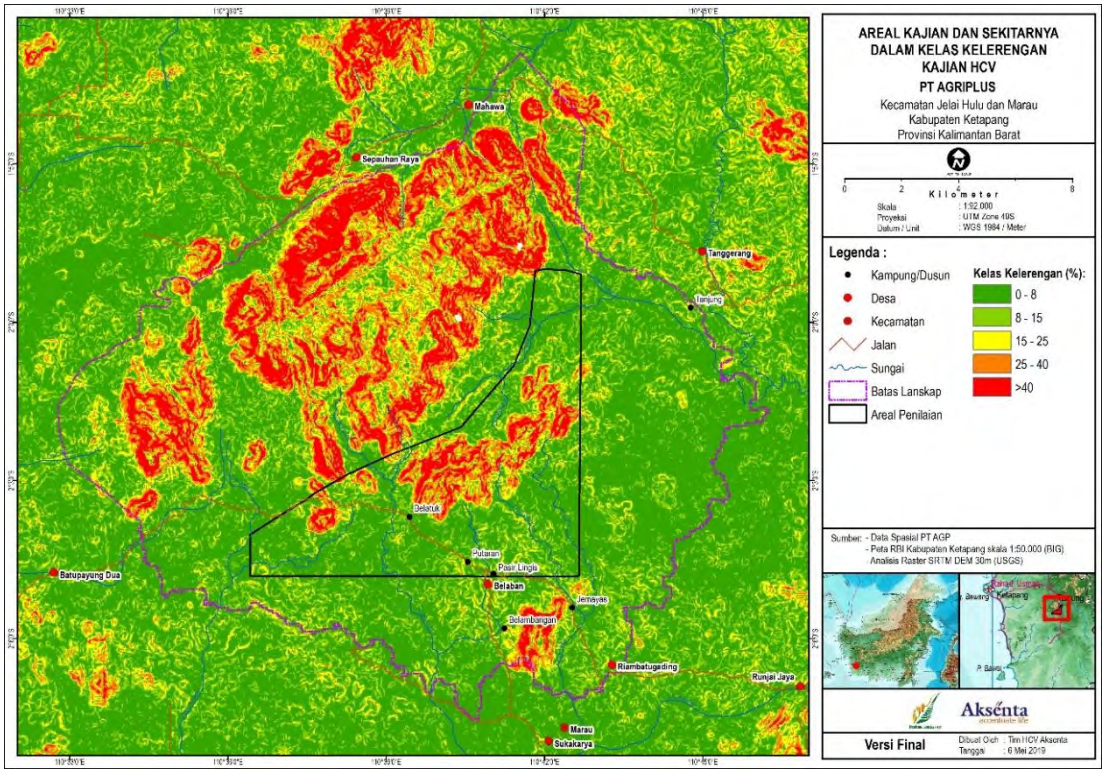
Map 40: Soil types in the study area and its surroundings

The entire study area is located at an altitude <400 meters above sea level. Half (50%) of the area is located at an altitude of 50-100 meter above sea level. In the middle, there is a hilly area with an altitude of 200-400 m above sea level. The area covers 362.5 ha or 6% of the study area. Hilly areas are also found in the north of the study area, namely in the Gunung Raya Protected Forest Area.

In general, the study area is a flat area with a slope of <8%. However, in this area there is an area with steep slopes with a slope of 25% to> 40%. These areas are hills, some of which are still covered with secondary forest and shrubs. The existence of this hill area has an important value in the context of environmental services, especially in relation to water catchment functions, erosion control and sedimentation.



Map 41: Topography in the study area and its surroundings



Map 42: Slope of land in the study area and its surroundings

3.6 Green House Gasses

Greenhouse Gas emissions on the development plans area are calculated using the RSPO PalmGHG Calculator Version 3.0, as of January 2017.

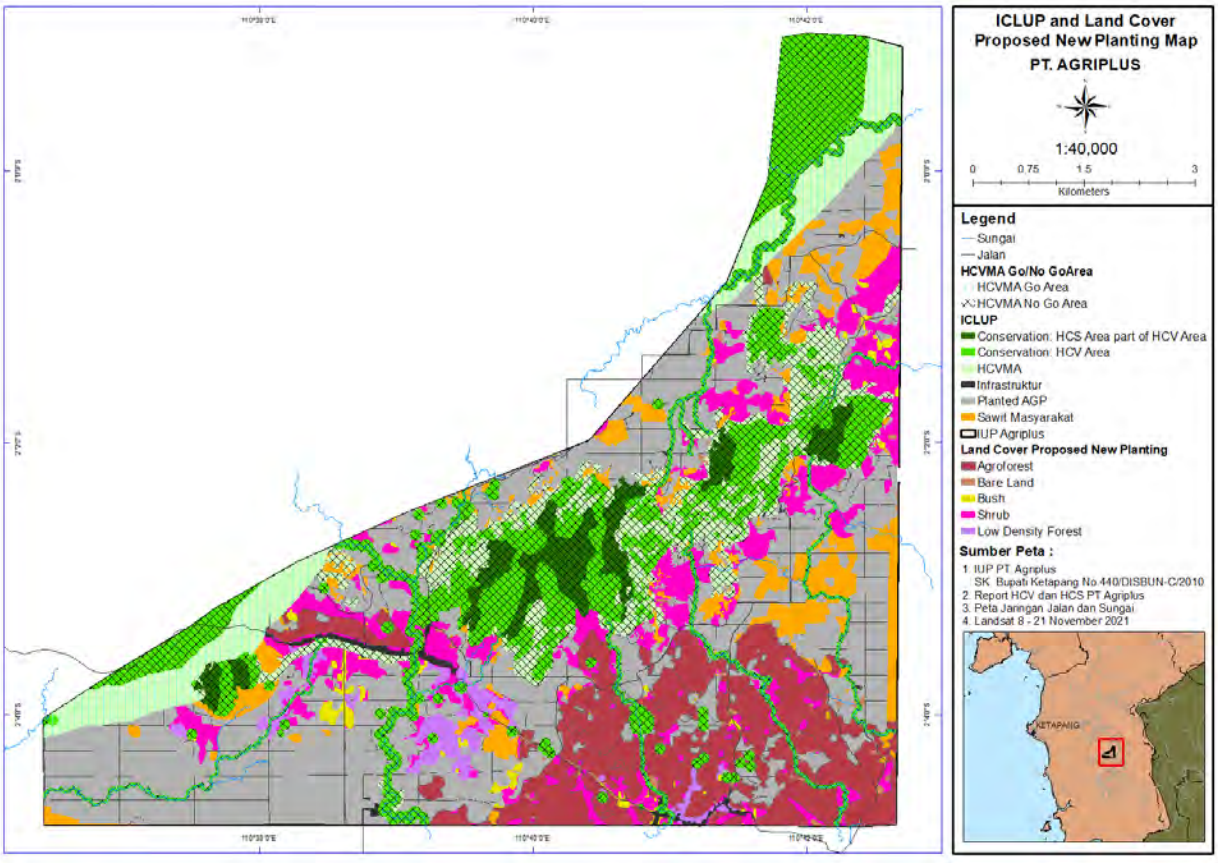
The development and new planting for PT Agriplus will be based on the plantation permit (IUP), an area of 6,100 ha. Primary data used: Land cover class & average carbon value; Spatial data map of permit boundaries; and Map of Conservation Area, land cover, soil types, and distribution of carbon stock map.

Table 49: Summary of Land Cover Class & Carbon Value

Land cover class	Average carbon value	Physical description of the land cover
Low Density Forest (Hutan lahan rendah sekunder kerapatan sedang)	83.79	Secondary forest is found in areas with steep slopes. The remaining secondary forest in the study area is relatively protected from human disturbance due to difficult access, so that utilization in these areas is limited. However, repeated fires have also caused damage to the remaining forests.
Young Regenerating Forest (Hutan lahan rendah sekunder kerapatan rendah)	55.86	Scrub in the study area is found in areas with steep slopes. There are two types of shrub distribution in the study area, namely shrubs which are part of the expanse of secondary forest and shrubs that are scattered sporadically.
Agroforestry (Kebun campuran)	90.78	Agroforestry is community lands that are still managed or those that have been abandoned. These lands are classified as agroforestry because they have high biomass, however, the condition is not natural. Agroforestry lands are also lands that have been disturbed by repeated fires. Therefore, agroforestry is not classified as a potential land cover for HCS conservation, except for agroforestry lands which are tembawang areas (old gardens of cultural value to the community).
Shrub (Semak dan belukar)	57.99	Shrubs were found scattered throughout the study area. Shrubs are lands that are disturbed and are in an early successional stage. In general, shrubs in the study area are land that has been cleared for fields and/or areas that have not been burned for a long time and have experienced succession. The dominant species found in the shrubs were penaga (Callophylum grandifolium), rubber (Hevea brasiliensis), and pulai (Alstonia scholaris). The diversity of species and evenness of tree species in the bush is high.
Bushes (Semak)	12.78	Bushes were found in the form of land that had recently been cleared and/or burned. The bush area is dominated by weeds (Pennisetum polystachyon), rambang (Scleria sumatrensis), ferns (Stenochlaena palustris). Seedlings of tree species were also found in the bush area, including ubar (Syzygium sp.), nyatoh (Palaquium sp.), and garung (Macaranga gigantea).

Table 50: Land Use and Land Cover conditions on the Area propose for New Planting

Description		Area	
		Ha	%
A. Development Area		**2,456.40**	40%
Company Palm Oil	1,939.27		
Community Palm Oil	413.80		
Infrastructure	103.33		
B. Conservation Area		**2,125.86**	35%
HCV	1,029.03		
HCS Part of HCV	340.82		
HCVMA	756.00		
C. Potential New Development Area		**1,527.29**	25%
Agroforest	791.22		
Bare Land	31.40		
Bushes	47.38		
Shrubs	543.53		
Low density forest	113.76		
Total Area (A+B+C)		**6,109.55**	**100%**



Map 43: Land Cover Condition in the Area Proposed for New Planting and Land Use of PT Agriplus

Secondary data used:

(i) Planting Cycles

25 years of planting cycles.

(ii) Dosage of fertilisers

- TSP 2 kg/year/plant from Egypt
- MOP 2 kg/year/plant from Canada
- Urea 1.5 kg/year/plant from Bontang, East Kalimantan
- Kieserit 1.5 kg/ year/plant from Germany

(iii) Yield

FFB per year: 25 tonnes (average of Bumitama)

(iv) Processing

- Extraction CPO 24% (average of Bumitama's Mill)
- Extraction Kernel 5 % (average of Bumitama's Mill)
- Extraction Shell 4 % (2% to be used and 2% for sale)

(v) Conservation Area

Conservation Area is determined by the company are 2,125.86 ha, this included the HCV and HCS Area. There is no peat land at the area of PT Agriplus, and there will be no land clearance in the Conservation Area.

Alternatives of land development:

a. Preparation of the alternatives of land clearing based on cut and overlay maps by block characteristic
b. The alternatives of land clearing are based on Sustainability Policy and regulations, good agricultural practises, good management of mills, considering the carbon stock rate of the area.

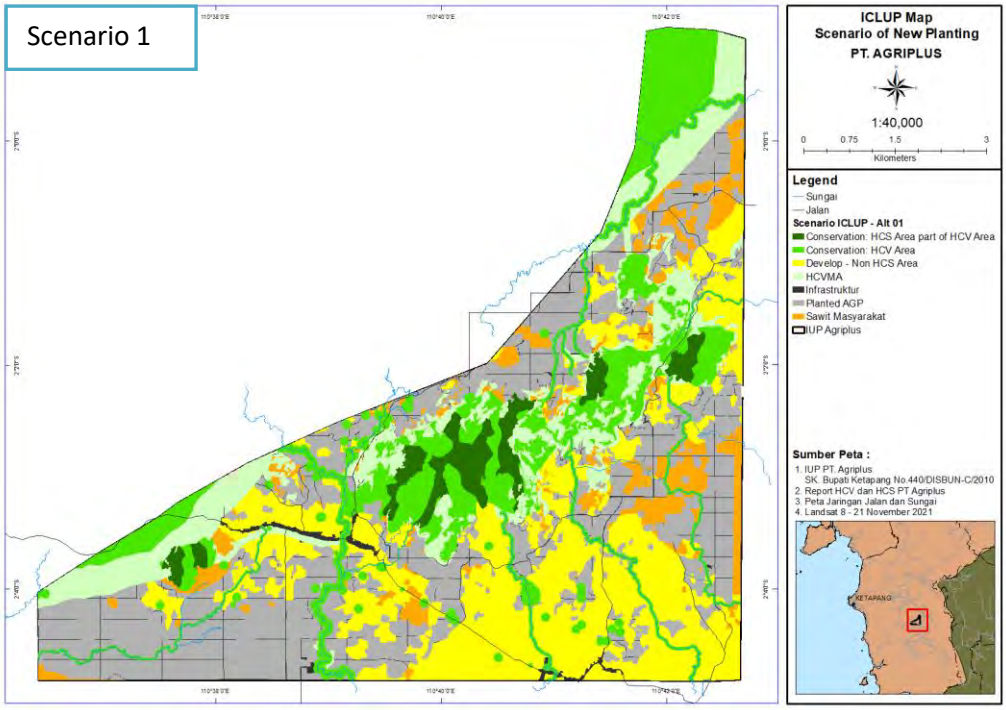
Table 51: Description of Development Scenarios

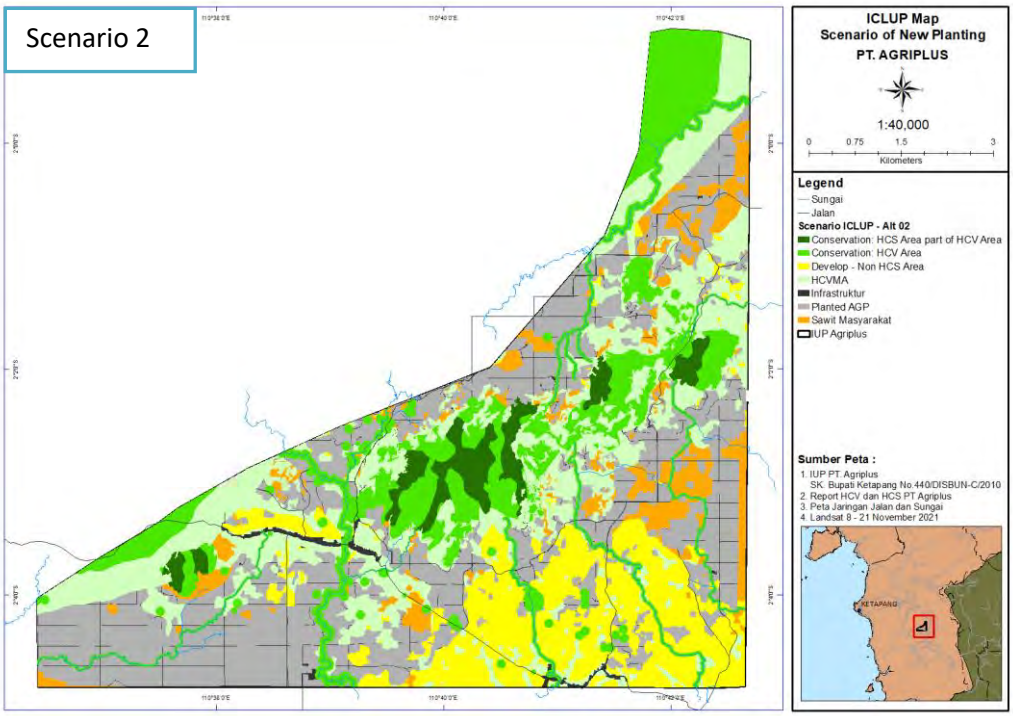
Scenario 1	• No land clearance on planned conservation areas in community land; • Land clearance of all mineral land in any land cover; • No plan both for mill and methane capture facilities; • Total planting plan = **1,527.29** ha.
Scenario 2	• No land clearance on conservation areas in community land; • Land clearance of all mineral land; • Avoid Shrubs Area; • No plan both for mill and methane capture facilities; • Total planting plan = **871.83** ha.
Scenario 3	• No land clearance on conservation areas in community land; • Land clearance of all mineral land; • Avoid Shrubs and Bushes Area; • No plan both for mill and methane capture facilities; • Total planting plan = **822.15**ha.

Table 52: Resume of Development Scenarios

Description		Area (ha)	Scenario of Development		
			Alt 01	Alt 02	Alt 03
A. Land Use					
Palm Oil		1,939.27	1,939.27	1,939.27	1,939.27
Community Palm Oil		413.80	413.80	413.80	413.80
Infrastruktur		103.33	103.33	103.33	103.33
B. Conservation Area		2,125.86	2,125.86	2,125.86	2,125.86
Add on conservation area (others)		-	-	656.26	705.14
C. Area Propose for New Planting		1,527.29			
Agroforest	791.22		791.22	791.22	791.22
Bare Land	31.40		31.40	31.40	29.89
Bushes	47.38		47.38	47.38	1.04
Shrubs	543.53		543.53	1.04	-
Low density forest	113.76		113.76	-	-
Total Development Area (ha)			**1,527.29**	**871.03**	**822.15**
Plan for Methan Capture			**N**	**N**	**N**
Total Area		**6,109.55**	**6,109.55**	**6,109.55**	**6,109.55**

Map 44: Scenarios on Development Plan of PT Agriplus.
All the Conservation Area are avoided to land clearance





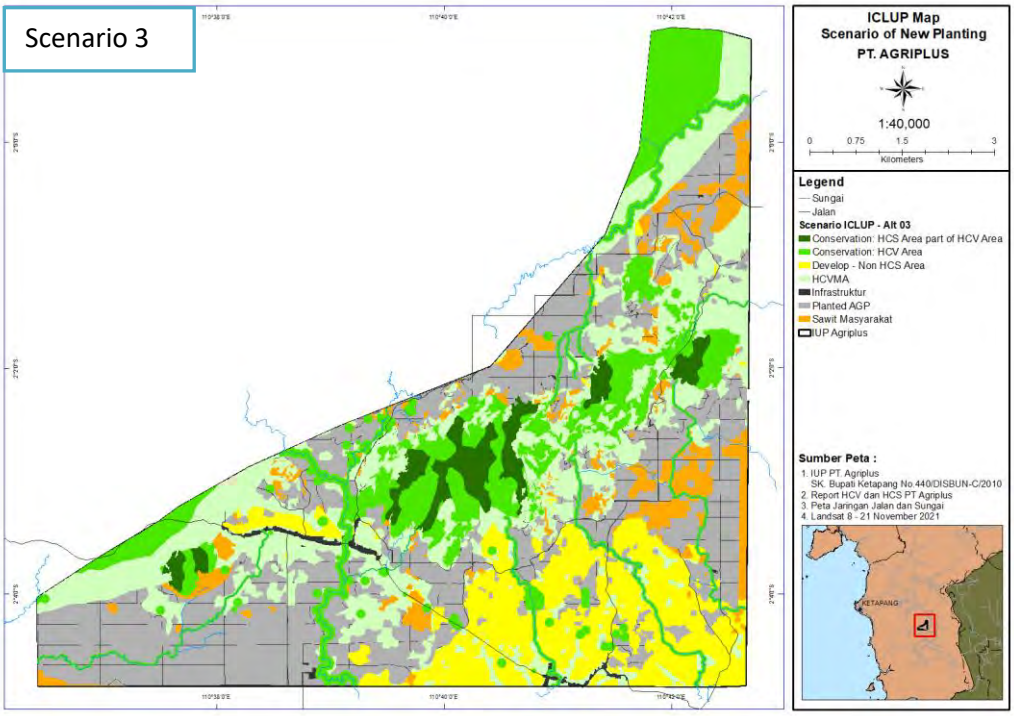
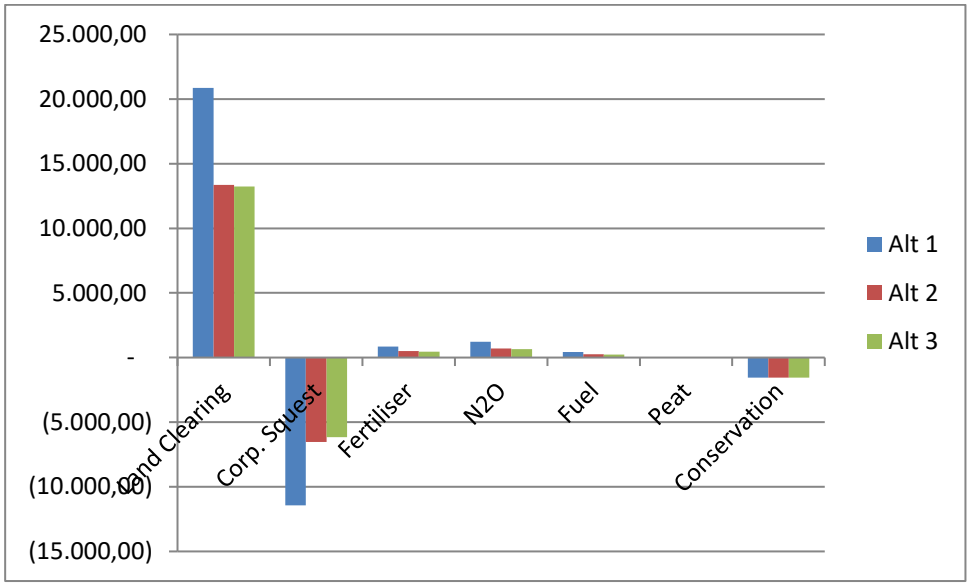


Table 53: Summary of GHG calculations based on land development alternatives

Alt.	Land Clearing	Corp. Squest	Fertiliser	N2O	Fuel	Peat	Conservation
Alt 1	20,861.76	(11,438.47)	860.80	1,221.83	438.39	-	(1,540.15)
Alt 2	13,346.67	(6,523.50)	490.92	696.83	250.02	-	(1,540.15)
Alt 3	13,224.33	(6,157.36)	463.37	657.72	235.99	-	(1,540.15)

Table 54: Total Emission per ton of product based on the land clearing alternatives

Alt.	Total Field Emission tCO2e	t CO2e/ha	tCO2e/t FFB
1	10,404.17	8.52	0.34
2	6,720.79	9.64	0.39
3	6,883.89	10.47	0.42



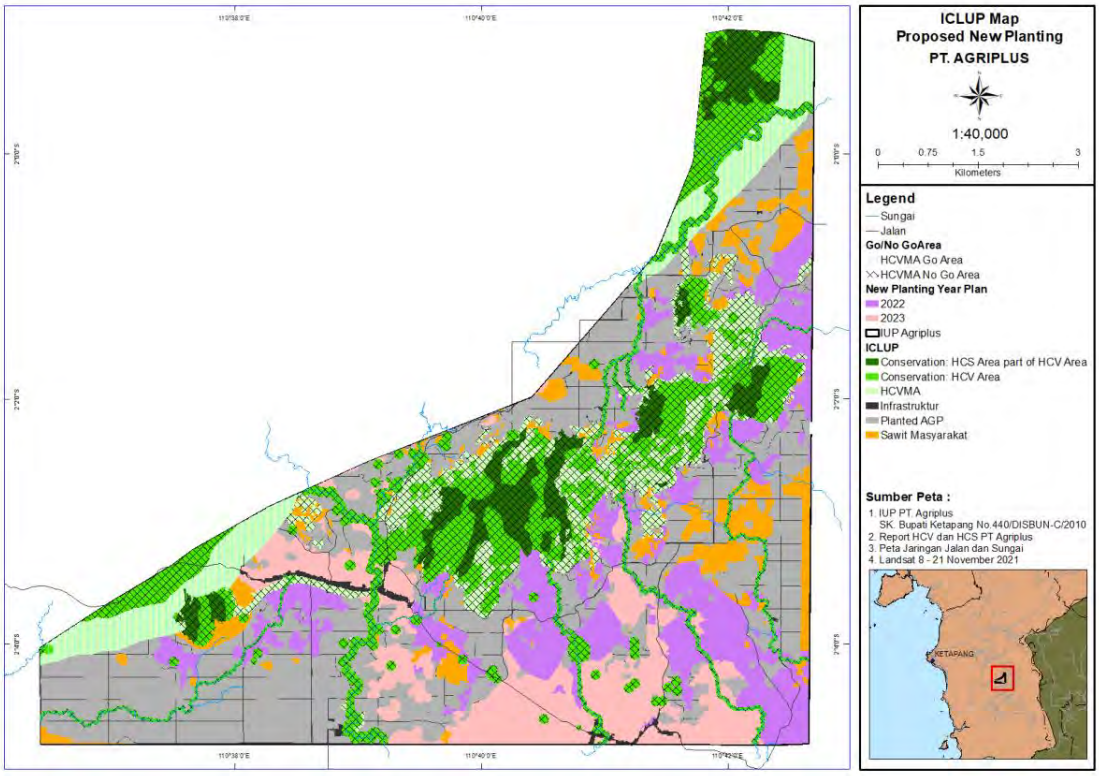
Graphic 5: GHG Calculation based on land clearing alternatives

Based on the GHG calculation, PT Agriplus will follow land clearance in accordance with the first alternative, with total emission produced from estate (plantation) 3,696.92 tones CO_2e. While the emissions per ton of product (FFB) is 0.11 tons CO_2e, with 2.75 tones CO_2e/ha. This option was chosen by taking into account the wishes of the community during the FPIC process, to surrender their rubber plantation land/ fields (agroforestry) to be converted into oil palm plantations.

The details are following:

- No land clearance on planned conservation areas in community land;
- Land clearance of all mineral land in any land cover;
- No plan both for mill and methane capture facilities;
- Total planting plan = **1,527.29** ha, devided into 2 years of development

PT Agriplus has submitted its GHG Report for New Planting, which includes plans on how to mitigate its emission to the Green House Gas Unit at RSPO and and approved on 14 October 2021.



Map 45: Development Plan Area on PT Agriplus

Table 55: Carbon Value Summary of the Development Area

Potensial Development	Area (Ha)		tC/ha	tCo2e/ha	total tCo2e
2022		**860.57**			
Agroforest	366.36		90.78	332.86	121,946.79
Bare Land	18.60		9.80	35.93	668.49
Bushes	36.81		12.78	46.86	1,725.14
Shrubs	388.31		57.99	212.63	82,567.30
Low density forest	50.48		83.79	307.23	15,507.86
2023		**666.72**			
Agroforest	424.85		90.78	332.86	141,417.17
Bare Land	12.80		9.80	35.93	459.93
Bushes	10.56		12.78	46.86	494.99
Shrubs	155.22		57.99	212.63	33,004.18
Low density forest	63.28		83.79	307.23	19,442.13

3.7 LUC Analysis

Corporate land clearance is defined as land clearing for the purpose of oil palm plantation development and all facilities that support the sustainability of oil palm plantation activities. Whereas Non-corporate land clearance is defined as land clearing outside the company's objectives, including government projects that involve the community or to build public facilities, or by community members who act individually to support their livelihoods and without funding by any funding institution or organization even.

On satellite imagery, land clearing for corporate purposes can be clearly identified since the pre-assessment in the LUCA study was conducted. Corporate clearance has different land clearing characteristics than community clearing or causes of natural disasters. Land clearing is usually relatively broad, with a fast process, land clearing patterns and land cover depicted on satellite imagery are usually systematic / regular (one or more planting blocks can be seen on satellite images, not sporadic), and land clearing forms are usually square with a straight border. An additional feature that can indicate land clearing or degradation caused by clearing by corporations is the existence of block roads.

PT AGRIPLUS conducted corporate clearance in the period December 2007 - December 2009 and in the period January 2010 - May 2014. Non-coporate clearance that occurred around the study area was land clearing by communities around the PT AGRIPLUS study area for farming needs. In addition it was also found changes in land cover due to land fires in 19997-1998.

Table 56: Historical Land Use Change in each cut-off date (in hectares), based on Permitted Location

Land Cover	Area in Ha							
	Nop-05	**Nop-07**	**10-Jan**	**Mei-14**	**17-Apr**	**Agust-17**	**Dec-19**	**Nov-21**
Secondary Forest (Hutan Sekunder)	1.084,3	1.062,8	961,8	353,4	205,1	205,1	1,192.47	1,192.47
Old Shrub (Belukar)	45,5	41,3	41,3	28,1	25,0	25,0	229.65	229.65
Agroforest	1.613,3	1.613,3	1.569,0	1.456,2	1.185,7	1.185,7	204.97	204.97
Young Shrub (Semak Belukar)	1.579,3	1.757,2	1.987,3	2.026,2	987,1	987,1	3,131.95	3,131.95
Bushes (Semak)	1.195,6	1.251,1	1.377,0	606,3	442,2	442,2	45.37	45.37
Bare Land (Lahan Terbuka)	591,6	383,9	173,2	442,6	132,6	132,6	50.10	50.10
Oil Palm (Kelapa Sawit)	-	-	-	1.196,8	3.131,9	3.131,9	1,255.05	1,255.05
Total	6.109,6	6.109,6	6.109,6	6.109,6	6.109,6	6.109,6	6,109.55	6,109.55

Table 57: Raw land covers data per period on the potential development area

Period November 2005 - November 2007- ***in hectares***									
Non-Corporate									
	Land cover class	November 2007							
		Agroforest	Belukar	Hutan Sekunder	Kelapa Sawit	Lahan Terbuka	Semak	Semak Belukar	Total Nov 05
November 2005	Agroforest	1,613.30	-	-	-	-	-	-	1,613.30
	Belukar	-	41.27	-	-	-	-	4.21	45.48
	Hutan Sekunder	-	-	1,062.80	-	0.68		20.80	1,084.28
	Lahan Terbuka	-	-	-	-	381.88	53.13	156.56	591.56
	Semak	-	-	-	-	-	1,191.17	4.48	1,195.65
	Semak Belukar	-	-	-		1.32	6.80	1,571.17	1,579.28
	Total, Nov 07	1,613.30	41.27	1,062.80	-	383.87	1,251.10	1,757.22	6,109.55

Period December 2007-December 2010- *in hectares*

Non-Corporate

	Land cover class	Januari 2010							
		Agroforest	Belukar	Hutan Sekunder	Kelapa Sawit	Lahan Terbuka	Semak	Semak Belukar	Total, Nov 07
December 2007	Agroforest	1,568.98		-	-	44.32	-	-	1,613.30
	Belukar	-	41.27	-	-	-	-	-	41.27
	Hutan Sekunder	-	-	961.78	-	18.65		82.37	1,062.80
	Lahan Terbuka	-	-	-	-	60.22	136.67	186.99	383.87
	Semak	-	-	-	-	10.74	1,240.36	-	1,251.10
	Semak Belukar	-	-	-	-	39.28	-	1,717.94	1,757.22
	Total Jan 10	1,568.98	41.27	961.78	-	173.21	1,377.02	1,987.29	6,109.55

Period January 2010-May 2014- *in hectares*

Corporate

	Land cover class	May 2014							
		Agroforest	Belukar	Hutan Sekunder	Kelapa Sawit	Lahan Terbuka	Semak	Semak Belukar	Grand Total
January 2010	Agroforest	-	-	-	81.32	4.54	-	-	85.86
	Belukar	-	-	-	-	-	-	-	
	Hutan Sekunder	-	-	-	106.23	-	-	-	106.23
	Lahan Terbuka	-	-	-	71.72	18.65	-	-	90.37
	Semak	-	-	-	175.38	328.45	-	-	503.82
	Semak Belukar	-	-	-	762.15	10.74	-	-	772.89
	Grand Total	-	-	-	1,196.79	362.37	-	-	1,559.17

Non-Corporate

	Land cover class	May 2014							
		Agroforest	Belukar	Hutan Sekunder	Kelapa Sawit	Lahan Terbuka	Semak	Semak Belukar	Grand Total
January 2010	Agroforest	1,456.18	-	-	-	19.98	6.95	-	1,483.12
	Belukar	-	28.12		-	-	4.89	8.26	41.27
	Hutan Sekunder	-	-	353.37	-	4.65	38.12	459.41	855.56
	Lahan Terbuka	-	-	-	-	33.06	14.27	35.51	82.84
	Semak	-	-	-	-	-	498.85	374.34	873.20
	Semak Belukar	-	-	-	-	22.52	43.24	1,148.65	1,214.40
	Grand Total	1,456.18	28.12	353.37	-	80.21	606.32	2,026.18	4,550.39

Period May 2014-After the management unit acquired (December 2016) - *in hectares*

Corporate

	Land cover class	Apr-17							
		Agroforest	Belukar	Hutan Sekunder	Kelapa Sawit	Lahan Terbuka	Semak	Semak Belukar	Grand Total
May 2014	Agroforest		-	-	235.07	-	-	-	235.07
	Belukar	-	-	-	3.12	-	-	-	3.12
	Hutan Sekunder	-	-	-	125.27	-	-	-	125.27
	Kelapa Sawit	-	-	-	1,196.79	-	-	-	1,196.79
	Lahan Terbuka	-	-	-	362.37	-	-	-	362.37
	Semak	-	-	-	309.99	-	-	-	309.99
	Semak Belukar	-	-	-	899.32	-	-	-	899.32
	Grand Total	-	-	-	2,896.87	-	-	-	3,131.95

Non-Corporate

	Land cover class	Apr-17							
		Agroforest	Belukar	Hutan Sekunder	Kelapa Sawit	Lahan Terbuka	Semak	Semak Belukar	Grand Total
May 2014	Agroforest	1,185.73		-	-	35.38	-	-	1,221.11
	Belukar	-	25.00	-	-	-	-		25.00
	Hutan Sekunder	-	-	205.11		-	-	22.99	228.10
	Kelapa Sawit	-	-	-	-	-	-		-
	Lahan Terbuka	-	-	-	-	58.52	20.67	1.02	80.21
	Semak	-	-	-	-	10.09	286.24		296.33
	Semak Belukar	-	-	-	-	28.45	135.32	963.09	1,126.85
	Grand Total	1,185.73	25.00	205.11	-	132.45	442.23	987.09	2,977.61

Period May Apr 2017-Aug 2017 - *in hectares*

Non-Corporate

	Land cover class	Aug-17							
		Agroforest	Belukar	Hutan Sekunder	Kelapa Sawit	Lahan Terbuka	Semak	Semak Belukar	Grand Total
Apr-17	Agroforest	1,185.73	-	-	-	-	-	-	1,185.73
	Belukar	-	25.00		-	-	-	-	25.00
	Hutan Sekunder	-	-	205.11	-	-	-	-	205.11
	Kelapa Sawit	-	-	-	3,131.95	-	-	-	3,131.95
	Lahan Terbuka	-	-	-	-	132.45	-	-	132.45
	Semak	-	-	-	-		442.23		442.23
	Semak Belukar	-	-	-	-	-	-	987.09	987.09
	Grand Total	1,185.73	25.00	205.11	3,131.95	132.45	442.23	987.09	6,109.55

Period Aug 2017 - Dec 2019- *in hectares*

Corporate

	Land cover class	December-19							
		Agroforest	Belukar	Hutan Sekunder	Kelapa Sawit	Lahan Terbuka	Semak	Semak Belukar	Grand Total
Aug-17	Agroforest	-	-	-	-	-	-	-	-
	Belukar	-	-	-	-	-	-	-	-
	Hutan Sekunder	-	-	-	-	-	-	-	-
	Kelapa Sawit	-	-	-	-	-	-	-	-
	Lahan Terbuka	-	-	-	-	-	-	-	-
	Semak	-	-	-	-	-	-	-	-
	Semak Belukar	-	-	-	-	-	-	-	-
	Grand Total	-	-	-	-	-	-	-	-

Non-Corporate

	Land cover class	December-19							
		Agroforest	Belukar	Hutan Sekunder	Kelapa Sawit	Lahan Terbuka	Semak	Semak Belukar	Grand Total
Aug-17	Agroforest	1,183.36	-	-	-	0.07	1.92	7.12	1,192.47
	Belukar	-	25.00	0.14	-	26.81	34.28	143.42	229.65
	Hutan Sekunder	-	-	204.97	-	-	-		204.97
	Kelapa Sawit	-	-	-	3,131.95	-	-	-	3,131.95
	Lahan Terbuka	2.37	-	-	-	27.54	9.51	5.95	45.37
	Semak	-	-	-	-	6.92	33.40	9.78	50.10
	Semak Belukar	-	-	-	-	71.12	363.11	820.82	1,255.05
	Grand Total	1,185.73	25.00	205.11	3,131.95	132.45	442.23	987.09	6,109.55

PeriodDec 2019 - November 2021- *in hectares*

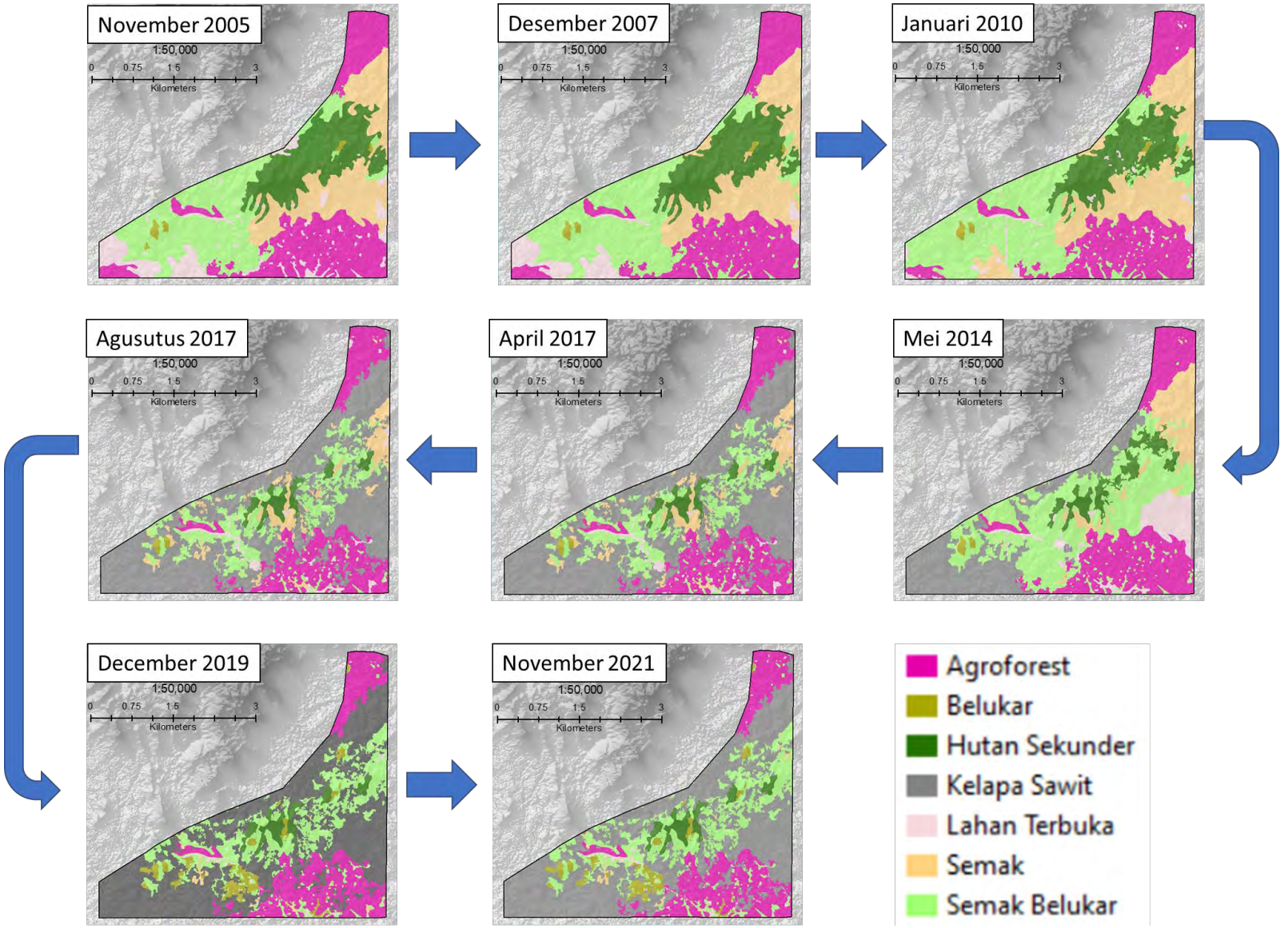
Corporate

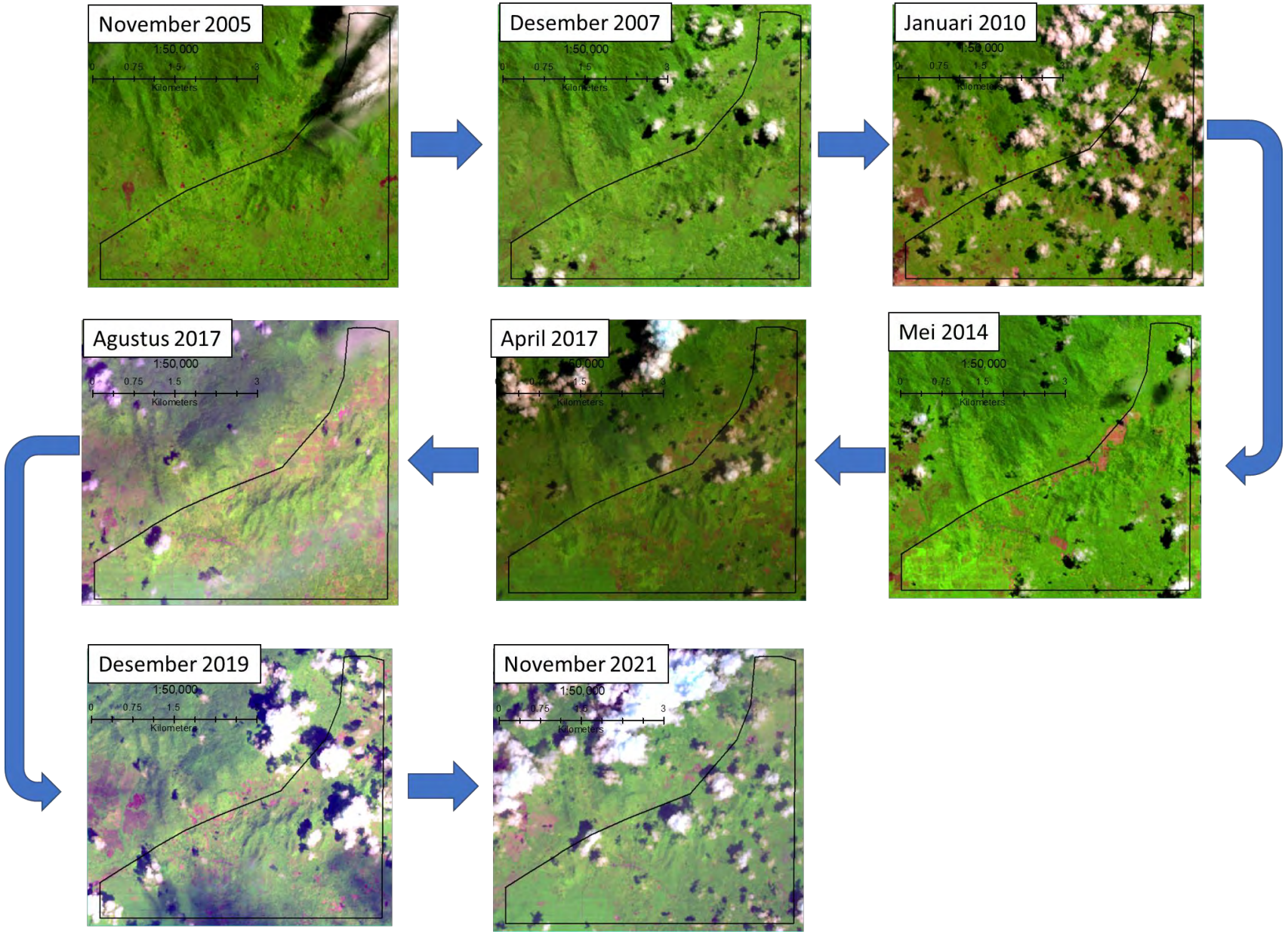
	Land cover class	November-21							
		Agroforest	Belukar	Hutan Sekunder	Kelapa Sawit	Lahan Terbuka	Semak	Semak Belukar	Grand Total
Dec-19	Agroforest	-	-	-	-	-	-	-	-
	Belukar	-	-	-	-	-	-	-	-
	Hutan Sekunder	-	-	-	-	-	-	-	-
	Kelapa Sawit	-	-	-	-	-	-	-	-
	Lahan Terbuka	-	-	-	-	-	-	-	-
	Semak	-	-	-	-	-	-	-	-
	Semak Belukar	-	-	-	-	-	-	-	-
	Grand Total	-	-	-	-	-	-	-	-

Non-Corporate

	Land cover class	November-21							
		Agroforest	Belukar	Hutan Sekunder	Kelapa Sawit	Lahan Terbuka	Semak	Semak Belukar	Grand Total
Dec-19	Agroforest	1,180.39	-	-	-	11.06		1.02	1,192.47
	Belukar	-	229.65	-	-	-	-	-	229.65
	Hutan Sekunder	-	-	204.97	-	-	-	-	204.97
	Kelapa Sawit	-	-	-	3,131.43	0.51	-	-	3,131.95
	Lahan Terbuka	-	-	-	-	26.31	15.55	3.52	45.37
	Semak	-	-	-	-	3.08	40.29	6.73	50.10
	Semak Belukar	1.21	-	-	-	18.87	2.50	1,232.47	1,255.05
	Grand Total	1,181.60	229.65	204.97	3,131.43	59.84	58.33	1,243.73	6,109.55

Map 45: Time Series LUC Analysis on the potential development area




November 2005
1:50,000
0 0.75 1.5 3
Kilometers
Desember 2007
1:50,000
0 0.75 1.5 3
Kilometers
Januari 2010
1:50,000
0 0.75 1.5
Kilometers
Mei 2014
1:50,000
0 0.75 1.5 3
Kilometers
April 2017
1:50,000
0 0.75 1.5 3
Kilometers
Agustus 2017
1:50,000
0 0.75 1.5 3
Kilometers
Desember 2019
1:50,000
0 0.75 1.5
Kilometers
November 2021
1:50,000
0 0.75 1.5 3
Kilometers

3.8 FPIC Process

Based on the existing recordings, the socialization related to the operations of PT Agriplus was carried out in Pakit Hamlet, Tanggerang Village which was held on January 30, 2016 by representatives of PT Agriplus management and attended by Tanggerang Village officials and 14 community leaders from Pakit Hamlet, Tanggerang Village. The material presented includes plans for oil palm plantation development, partnership plantation patterns and technical requirements and land legality that can be built for plantations as well as support and agreement on the value of GRTT compensation..

PT Agriplus has formally received the support from two village heads around the plantation site:

1. Head of Belaban Village, Sub-district of Marau: Letter number 140/02/PEM/2014 dated 2 November 2014 signed by Head of the village and Head of regional development agency (BPD), Head of Tribal Council and Belatuk Village.

2. Head of Teluk Runjai Village, Sub-district Jelai Hulu: Letter number 525.26/59/Bang tanggal 4 Mei 2016 signed by Head of the village and Head of regional development agency (BPD) Teluk Runjai and approved by Head of Jelai Hulu Sub-district.

Through the company's PR officer, PT Agriplus has also prepared participatory maps of land ownership and boundaries in certain villages. Participatory mapping with communities aims to look at land rights, land boundaries, and land use patterns. At the time of land release, the Company collaborated with the Satlak Desa Team for the processes of measuring, measuring and leveraging the land. From this process, community spatial data is generated in the form of maps, which will then become the basis for land compensation (GRTT).

As for now, PT Agriplus has obtained a land area of 3,865 ha of GRTT, with details; 3,452.81 ha of Belaban Village, 385.15 ha of Tangerang Village and 27.54 ha of Riam Batu Gading Village. Of these, 927.24 ha have obtained HGU certificates based on the Decree of the Head of BPN No 49/HGU/KEM-ATR/BPN/2015 dated 20 May 2015.

The plantation area that has been planted up to July 2017 is 3,090.87 ha which spreads in Belaban Village covering an area of 2,614.92 ha, in Tanggerang Village 282.39 ha and in Desa Riam Batu Gading covering an area of 12.24 ha. Meanwhile, the nursery was built in two places, namely in Division 2 covering an area of 0.58 ha and in Division 6 covering an area of 29.44 ha.

To support the company's operations, PT Agriplus has recruited workers for several types of work, with more than 90% workers are come from the local community. The number of workers until June 2021 was recorded at 392 people, all of them are permanent workers.

4. Summary of Management Plans

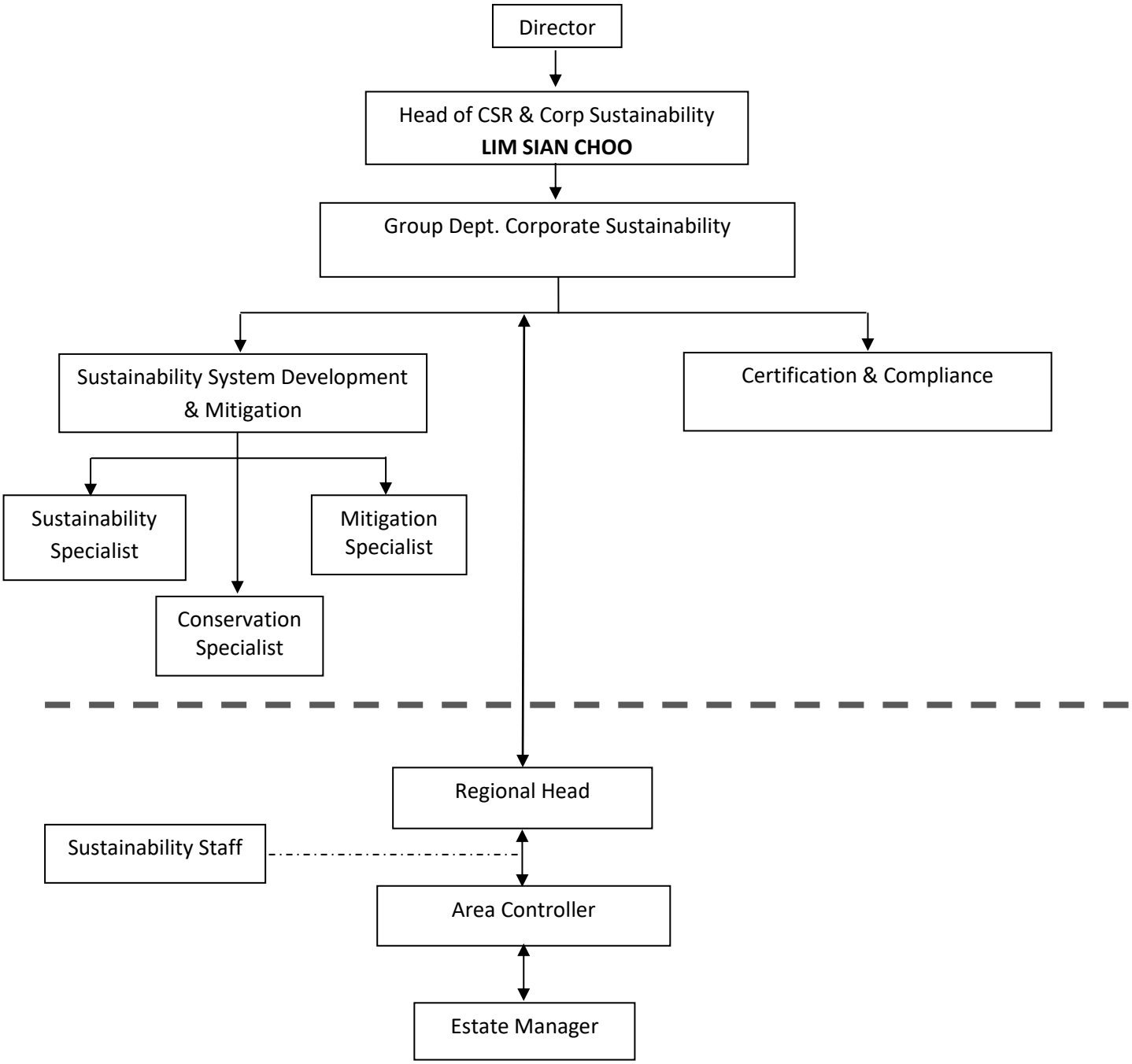
4.1 Team Responsible for Developing Management Plans

The process of HCV and SIA development and preparation of management and monitoring plans for PT Agriplus was implemented in phases involving several parties: Estate Department, the Public Affairs (PAD Department), Corporate Social Responsibility (CSR) Department, GIS Department and Sustainability Department. The whole process is in accordance with the plans facilitated by the Corporate Sustainability Department Head Office BGA Group. The details of the parties involved in the HCV and SIA development and preparation of management and monitoring plans are summarized in the following table.

Table 58: The Participatory List of developing management and monitoring plans for PT Agriplus

No.	Name	Department/ Expertise	Officeal Role
HCV-HCS Management & Monitoring Plan			
1	Hasmen Sitinjak	Regional Head	Participant
2	Andi Risman	Area Controller	Participant
3	Lim Sian Choo	Head of CSR & Corp. Sustainability	Participant
4	Hidayat Aprilianto	Head of Sustainability System Development & Mitigation	Participant
5	Muhammad Vikky Arindi	Mitigation Specialist	Facilitator
6	Putra Wibowo Malau	Conservation Specialist	Facilitator
7	Saeshaputi Rahmanita Prathiwi	Sustainability Specialist	Facilitator
SIA Management & Monitoring Plan			
1	Hasmen Sitinjak	Regional Head	Participant
2	Andi Risman	Area Controller	Participant
3	Gabriel Heru Prasetyo	Head of CSR Region Kalbar	Participant
Internal Review of the HCV & SIA Reports and implementation of Management & Monitotring (at head office)			
1	Lim Sian Choo	Head of CSR & Corp. Sustainability	Reviewer
2	Hidayat Aprilianto	Head of Sustainability System Development & Mitigation	Reviewer
3	Nandang Muyana	Head of Certification & Compliance	Reviewer

Management Team For Monitoring



4.2 Elements to Management & Monitoring Plans

4.2.1 Social Impact Assessment Management & Monitoring Plans

Stakeholders to be involved

The process of the SIA development and preparation of management plans and monitoring of PT Agriplus also involved relevant stakeholders such as local communities, the government of local village and Sub-District. It is aimed to provide opportunities for communication and sharing of information/opinion/suggestions between the PT Agriplus and stakeholders. Focus Group for Discussion consisted of people who were respondents (the workers, local communities and local government).

Table 59: Summary of Management and Mitigation Plans on Social Impact Assessment

Program	Activity	Challenge	Chance	Strategy	Output	Frequency	Time
Solving tenure issues around the company	Inventory and settlement of land claim case	a. There is a double claim to the land that is the garden plan b. Invalid community land ownership status/ sale/purchase land c. There is an inclave land that has not been in GRTT	a. The relationship between the company and the village apparatus and community leaders is quite good. b. The company's land has a clear legality. c. Local government and security forces support the company's activities. d. Cooperation with Villages and Communities on open land	a. Conduct intensive communication with communities that are still making land claims/ not willing to release their land b. Establish communication and involve village officials, community leaders and law enforcement in the settlement of cases. c. If the deliberation process does not find common ground, it is pursued to conduct legal proceedings. d. Not coercion and intimidation in the process of resolving land claims e. Document all land claim case settlement processes	a. Document settlement of land claim case b. Documents complete all compensation processes fairly and in accordance with regulations. c. The problem of tenure in PT. Agriplus	a. Complaints from Stakeholders received by Partnership Staff will be responded to at least 14 working days b. Cordiality gathering with Stakeholder Muspika, Indigenous Leaders, Community Leaders is carried out every 6 months c. Monitoring of claim cases will be reported and discussed of 1x a month during S2H meetings	2021-2023
Realization of Village Treasury Land (TKD) covering an area of 6 Ha	Invetarization and Plotting Village Treasury Land (TKD)	a. Sporadic planting area (uneven) b. There are unresolved areas GRTT / development c. There are areas that have not been embedded palm oil (Inclave)	a. The relationship between the company and the village apparatus and community leaders is quite good. b. The company's land has a clear legality. c. Joint Cooperation of Local Government, Villages, Plasma Cooperatives, and Community Leaders for land allocation	a. Conduct insensitive communication with local governments (Bappeda & Disbun), village governments as well as plasma cooperatives and community leaders b. Conduct an internal review with Management and Plantation Operations c. Doing socialization, mutual agreement to plotting TKD area d. Documenting all the process of handing over Village Treasury Land (TKD)	a. Document meeting with Stakeholders (Local Government, Pemdes, Cooperatives, Community Leaders) b. Plotting Acreage Documents, Planting Years, etc. c. Socialization Document, Village Treasury Land (TKD)	a. Communication with Bappeda, Disbun, and the Village Government and Plasma Cooperatives and Community Leaders is carried out once every 3 months b. Do a plantation field visit every 6 months c. Socialization and TKD Agreements are carried out after the Expansion of plantation areas	2021-2023

Program	Activity	Challenge	Chance	Strategy	Output	Frequency	Time
Socialization and Establishment of Cooperative Partnerships with *Stakeholders*	Increase socialization about plasma (area, location, supporting institutions and mechanisms /rules of the game)	a. Socialization about the rules of the game and the location of plasma is still lacking b. Public knowledge of plasma is lacking.	a. Plasma activities get support from various parties b. Motivation and full support from the community	a. Conduct intensive meetings to socialize about plasma, especially with regard to the area, rules of the game and the necessary requirements. b. Meeting with the community to create participatory plasma planning c. Involving communities, indigenous leaders and village governments in the implementation of inventory	a. Documents of the location, extent and land status of plasma garden candidates as well as plasma development plans prepared participatory b. There is an understanding and agreement between the company and the community regarding the construction of plasma.	The meeting with plasma administrators, Muspika, community leaders, indigenous leaders, and community representatives is held once every 3 months.	2021-2023
Generating income of the community	Capacity building in order to create alternative business and livelihood opportunities	a. People's knowledge and skills in entrepreneurship are still lacking b. Ongoing assistance is required.	a. There are local figures who have a good capacity. b. The potential for production and service is considerable. c. Accessibilas is quite good	a. Make a selection of prospective participants who have seriousness b. Doing mentoring c. Conducting entrepreneurial training activities d. Facilitation of capital and business equipment e. Ongoing mentoring activities in both production and marketing	a. Creating the opportunity for income alternative community and the occurrence of increased income of the community Documentation of activities	a. The formation of the Farmer Group is carried out once every 3 months b. Business Training, PIRT Products, etc. are carried out once every 6 months c. Monitoring and Marketing are done once every 1 month	2021-2023
	Building pilot area development of agriculture, fishery, livestock and vegetables / fruits, TOGA (family medicine) Plants	a. Inadequate training and infrastructure is required. b. Habit of looking for fish with nets & electric	a. Potential is quite high b. The market is quite open. c. The role of mothers can be through the active PKK Group	a. Preparing institutions and organizations at the community level b. Conducting training and ongoing assistance on the development of agriculture, superior rubber and fisheries (keramba),livestock, and vegetables / fruits	a. Creating alternative income for society b. Documentation of activities	a. Assistance in the formation of Business Groups according to the potential of the village is carried out once every 3 months b. Business Training, Human Resources Training, Production Improvement, etc. are carried out once every 6 months	2021-2023
Improving the quality of community education	Providing assistance for the development of educational facilities	a. Still low educational support facilities	a.Fasilitas and educational activities have been running	a. Carry out a plan for the development of educational facilities according to priorities	a. Increase educational facilities in villages around PT. Agriplus	External Education Participation is carried out once every 6 months	2021-2023

Program	Activity	Challenge	Chance	Strategy	Output	Frequency	Time
Improving the quality of public health	Checking health and treatment to the community	a. Public awareness and knowledge about health is low. b. Health facilities are not standard.	a. Facilities and corporate networks in the field of health are quite adequate b. There are many partners that can be invited to work together.	a. Determine the location of activities that are a priority b. Carrying out activities in collaboration with the local health service (Puskesmas & Hospital)	a. Improving the quality of public health b. Documentation activities for example free treatment, mass circumcision, etc.	Participation in Health Activities with Puskesmas, Hospitals, etc. is carried out once every 6 months	2021-2023
Improving the preservation of local culture of local communities	Preservation of local community sites / cultural places and support activities related to the local culture of the community	a. The need for land for plantations is quite high. b. Public awareness of the importance of maintaining local cultural venues/sites still has to be improved.	a. The company's commitment is quite high. b. There are community leaders who are still very concerned about the preservation of the place related to local culture.	a. Inventory sites /places that have participatory local cultural value b. Involving communities, indigenous leaders, village officials in determining invenatrization,and maintenance plans in the future c. Document all inventory results d. Support and engage in local cultural activities, such as cultural ceremony gawai dayak, etc.	a. Inventory documents and maintenance and development plan documents b. Publication and socialization c. Documentation of customary activities.	Participation in Local Cultural Arts activities is carried out once every 3 months	2021-2023
Improve environmental management (rivers, air, and infrastructure)	Managing the environment around the company and the local community	a. The use of water for the needs of the community is getting higher. b. There is access to transportation between the community and companies that are routine.	a. The company's commitment is quite high. b. Company facilities and tools are available c. Cooperation with local government, government, community leaders, indigenous leaders is going well.	a. Inventory contents and markings for acreage and river, clean water point, etc. b. Involving communities, indigenous leaders, village officials in determining invenarization,and sustainable maintenance plans c. Document all inventory and implementation results d. Cooperate with other stakeholders to maintain water and air quality	a. Inventory results documents and maintenance and implementation plan documents b. Publication and Socialization c. Documentation of activities	Participation in Social and Environmental activities is carried out once a month and tentatively	2021-2023
Build Communication and network with all *stakeholders* related to PT. Agriplus	Have regular meetings with *stakeholders*	a. The types and characteristics of stakeholders are not uniform. b. The interests and willingness of each stakeholder vary widely.	a. Communication between the company and stakeholders has been established. b. Stakeholder supports the existence of PT. Agriplus	a. Create a regular schedule b. Determine the theme for each meeting c. Documenting the results of the meeting d. Followup on the results of the meeting	a. Establishing communication and coordination between the company and all *stakeholders*	Meeting with Stakeholders is carried out about once every 6 months	2021-2023

Program	Activity	Challenge	Chance	Strategy	Output	Frequency	Time
Revamping the field of employment	Improve employee knowledge and understanding of labor regulations	a. Socialization of limited labor acceptance b. The level of Graduate Education and Human Resources of the Community is still low c. Employee knowledge and understanding of employment rules has not been evenly distributed d. Working Time Discipline	a. The company has followed thegovernment's militaryrules. b. The company already has labor rules that apply internally.	a. In collaboration with Muspika, Community Leaders, Indigenous Leaders, Disnaker for the socialization of open labor acceptance b. Create a socialization schedule of labor rules to employees c. Create a pocketbook of employment regulations	a. Data of local workers working in PT. Agriplus (PT. AGP) b. Increased employee knowledge and understanding of employment rules c. Improved performance quality at work.	a. Employment Socialization is carried out about once every 6 months b. Employee recruitment is carried out about once a year c. Company Rule Book Creation, safety is done once every 1 year	2021-2023
	Improving employee safety	a. Employee knowledge of job safety has not been evenly distributed b. Training on job safety has not been done periodically	There is already a commitment from the company to improve employee safety.	a. Carry out training on job safety periodically b. Create a work safety pocketbook	a. Improved employee safety b. Decrease in periodic work accidents c. Work safety pocketbook	a. Safety training is done about once every 6 months b. The creation of a safety pocketbook is done about once a year	2021-2023
	Improving Self-Protection Equipment (APD) facilities	a. Completeness of PPE for employees is still lacking b. Employee discipline in using PPE is still lacking	There is a commitment from the company to increase the willingness of PPE and increase employee discipline in using PPE.	a. Create an evaluation and plan for improvement of PPE b. Socializing about the importance of using PPE c. Provision of PPE in accordance with plans and needs, including for backup. d. Socialization activities for the use of PPE & sanctioning offenders	a. Improved employee safety and occupational health b. The number of many work accidents	a. Socialization and Monitoring of PPE is carried out once every 3 months b. Provision of PPE as needed min once every 6 months	2021-2023

4.2.2 Social Environment Impact Assessment (SEIA/ AMDAL) Management & Monitoring Plans

The Social Environment Impact Management & Monitoring Document (RKL-RPL) was approved by Head District of Ketapang, by decree number 168/BLHD/2010, dated 24 March 2010.

Table 60: Summary of Management and Mitigation Plans on Environment Impact Assessment

No	Impact	Source of Impact	Location	Environment Management		Environment Monitoring	
				Plan	Period	Indicator & methode	Period
1	People's behavioral and perception, also Social Conflict	- Operational socialization - Company's delineation, land acquisition - Land clearing - Transportation of FFB - De-mobilization of equipment	Villages around the company (Sub-district of Marau and Jelai Hulu, Ketapang, West Kalimantan)	- Participatory Mapping - Socialization on every steps of activity transparently to villagers - Good engagement and communication with community's leader and public figure - Carried out the land compensation in appropriate with the agreement - Work & coordination with government institutions of village, district and related agencies - Performs various activities that show company's concern to community interest - CSR activities according to local people needs	At least once before the operational socialization, and continued per 3 months during the land acquisition	Increasing the positive perception of the public against the plantation activities. **Methods**: observation and interviews	Once a year during the oil palm plantation operational
2	Increased of job opportunities	- Oil palm cultivation - Employee recruitment	Villages around the company (Sub-district of Marau and Jelai Hulu, Ketapang, West Kalimantan)	- Transparently open recruitment - Give the priority to locak people to work at the plantation, as long as meet the qualifications required - Providing the employees' rights in appropriate with the regulations	Continuous every recruitment activity	- There are no disputes and disagreement between the community with the company or with the workers in the company. - Workers database	Workers reporting to Labor Agencies once per year
	Increased of bussiness opprotunities	- Employee recruitment - Oil palm plantation operational	Villages around the company (Sub-district of Marau and Jelai Hulu, Ketapang, West Kalimantan)	- Work with local communities to do - Training of enterpreneurship		-	

3	Ambient air quality	- Land clearing - Mobilization of heavy equipment and materials - Land clearing - Transportation of FFB - De-mobilization of equipment	Emplacement and the area around operational area. 1. Alternative 1 of Mill location: 02°04'11.80" S 110°36'38.01" E 2. Hamlet of Putaran: 02°03'03.63" S 110°38'37.07" E 3. Alternative 2 of Mill location: 02°04'12.71" S 110°39'02.56" E 4. Hamlet of Belatuk: 02°05'44.52" S 110°41'41.44" E 5. Hamlet of Tanjung: 01°59'30.55" S 110°45'10.91" E	<u>Technology approach:</u> - Watering the roads around the operational area to reduce dust - Plant to reforestation along the way around settlement and emplacement - Roads maintenance - Good maintenance of FFB transport vehicle to pressing the exhaust gas - Air quality testing <u>Socio-economic approach:</u> - Facilitating the communities to participate the reforestation - Socialization to the workers to wear mask at work - Financial allocating to implement technological, socio-economic and institutional approaches - Institutional approach: - Work with accredited institution/ laboratory to do air quality testing	Regularly watering the roads during the land clearing phase Once every 3 months on dry season and once every 6 months on rainy season	- Parameters of air quality levels in accordance with laws and regulations (PP No. 41 Thn 1999) - Controlling and preventing the arising derivative impact of air quality reduction - Environmental quality analysis reports to relevant agencies	- Once per 6 months. - Reporting to relevant agencies: once per 6 months
4	Increased rate of noise level	- Land clearing - Mobilization of heavy equipment and materials - Construction of operational facilities & infrastructure - Transportation of FFB	Emplacement, main road and the area around operational area. 1. Alternative 1 of Mill location: 02°04'11.80" S 110°36'38.01" E 2. Hamlet of Putaran: 02°03'03.63" S 110°38'37.07" E 3. Alternative 2 of Mill location: 02°04'12.71" S 110°39'02.56" E 4. Hamlet of Belatuk: 02°05'44.52" S 110°41'41.44" E 5. Hamlet of Tanjung: 01°59'30.55" S 110°45'10.91" E	<u>Technology approach:</u> - Routine maintenance of heavy equipment used during land clearing and infrastructure construction - PPE used - Implement the rate limit of vehicle	Every day on land clearing and infrastrcture construction phase	- Parameters of noise levels in accordance with laws and regulations (PP No. 41 Thn 1999)	- Once per 6 months. - Reporting to relevant agencies: once per 6 months

5	Public health level (include workers) and Work Accident	- Mobilization of heavy equipment and materials - Maintain oil palm plants	Plantation area and villages around the company (Belaban and Tanggerang)	<u>Technology approach:</u> - Routine medical check up to the workers - Socialization of the important to wear PPE - Provide the medical clinic - Clean Water Sources support - Planting plants on roads frequently traversed by the community and managing water quality - Put up traffic signs <u>Socio-economic approach:</u> - Provide the appropriate PPE for workers - Giving supplements to workers who susceptible to contamination due to the operation of the tools plantations - Providing health insurance for workers - Provide environmental sanitation such as toilet construction which is eligible. <u>Instituional approach:</u> - Working closely with agencies such as health centers in the preparation of medical personnel and clinics	Four times during construction phase	Decrease levels of public health and workers by the increasing number of visits due to respiratory diseases. **Methods**: - Medical check up for the workers - data analysis from the company clinic	Once per 6 months

6	Decrement of Water quality & aquatic biota	- Land clearing - Nursery activity - Maintaing oil palm plants	On the river and riparian area on the PT Agriplus area. 1. Langsat River: 02°03'53.96" S 110°36'36.44" E 2. Semulakan River: 02°40'11.95" S 110°37'56.11" E 3. Putih River (on the upstream): 02°02'31.91" S 110°38'10.44" E 4. Putih River (on the downstream): 02°03'57.95" S 110°39'11.06" E 5. Baka River: 02°04'13.02" S 110°39'53.30" E 6. Sentabik River: 02°04'08.74" S 110°40'21.39" E 7. Tumpayah River: 02°04'09.34" S 110°42'15.47" E 8. Sepupuan River: 01°59'23.16" S 110°42'45.77" E	<u>Technology approach:</u> - No land clearing on the riparian area/ greenbelt. Put the signboard of prohibition to damage the riparian area - Optimizing the ecological function of river borders for the self-purification process - Choosing a nursery locations in flood-free land - Maintain a buffer zone with plants that can withstand erosion rates - supervise and control the use of chemical fertilizers and pesticides - Do not clean the working tools int the river - POME test before its application to plantation <u>Socio-economic approach:</u> - Socialization to the workers and community, about land and water conservation, protected area and riparian area conservation - Budget allocation to water conservation, protected area and riparian area conservation	- Once every 3 months on dry season and once every 6 months on rainy season - POME test: once per month	- There are no water pollutan by chemicals, waste, POME and any other opertional activities impacts. - Environmental quality analysis reports to relevant agencies **Methods**: water quality testing based on government regulation (parameter TSS, TDS, BOD, COD, Ammonia, Total Fosfat dan pH, based on PP No. 82 Thn 2001). -	- Once per 3 months. - Reporting to relevant agencies: once per 6 months
7	Increased rate of erosion and sedimentation	- Land clearing - Construction of operational facilities & infrastructure	Plantation Area	<u>Technology approach:</u> - Land clearance without destructive the topsoil - Maintaining the drainage and roads through road hardening, to reducing the erosion rate - Plant the cover crops right after the land clearing - Construction of drainage and ditches - Soil and water conservation	Continuous during land clearing phase, road construction and thereafter 3 times a year	Measuring the erosion rate	Once per 6 month

8	Land and forest fire potential	- Land clearing - Construction of operational facilities & infrastructure - Replanting	Plantations area and around	<u>Technology approach:</u> - Land clearing without burning - Construction the fire tower control ➔ Location 1: 02°03'40.23" S 110°37'54.80" E ➔ Location 2: 02°02'42.80" S 110°40'10.12" E ➔ Location 3: 02°00'57.82" S 110°41'58.16" E - Firebreak tracking - Form and trains the fire fighting team - Create and maintain reservoirs (water basins) in the catchment area with adequate capacity - Procurement of facilities and infrastructure of fire control and fire fighting management refers to Surat Direktorat Jenderal Perkebunan Departemen Pertanian No. 824/LB.130/E.6/10/09 (*Lampiran 7*) - Periodically patrol especially on dry season <u>Socio-economic approach:</u> - Socialization to the community to do land clearing without burning - Involving the community to provide and maintaining drainage and planting of cover crops - Involving the community in providing the seeds for enrichment plants and rehabilitations <u>Institutional approach:</u> - Work with related agencies (Manggala Agni, BKSDA, etc) to implement the fire prevention program - Forming the firefighting group and provide them with fit training	Continuous intensively, especially on dry season	There is no land fire in the company and around. **Methods**: field survey monitoring & online hot spot monitoring	Continuous intensively, especially on dry season

9	Biodiversity of Flora & Fauna	- Land Clearing - Construction of operational facilities & infrastructure	- Around the plantation Area. - River riparian area: ➔ Monitoring Location 1: 02°02'57.50" S 110°37'56.29" E ➔ Monitoring Location 2: 02°04'01.57" S 110°36'43.23" E ➔ Monitoring Location 3: 02°03'55.08" S 110°41'57.26" E ➔ Monitoring Location 4: 02°01'36.89" S 110°40'57.92" E	<u>Technology approach:</u> - Protection of flora & fauna on the area with good condition of ecology - Put the information boards for prohibition illegal logging of protected species of flora (especially on riparian area and area near the protected forest) and illegal hunting. - Planting and maintaining the ecological functioning types of vegetation for the existing animals, so as they have space for feeding, covering, and breeding - Periodically monitoring patrol <u>Socio-economic approach:</u> - Socialization to the community about biodiversity of flora & fauna surrounding the operational area - A persuasive approach to the community not to do the activities that cause the loss of protected flora & fauna and have an ecological function, in the plantation area, riparian area and near to protected forest <u>Institutional approach:</u> Involving the related agencies, in efforts to protect and preserve the protected flora & fauna around the operational area	Once per 3 months, continuous intensively when its needed	- Biodiversity index of flora and fauna - Disruption to protected flora and fauna **Methods**: field survey	Once per 3 months, or continuous intensively when needed
	Pencemaran Toxic & Hazardous Waste	- Maintenance of oil palm plant		<u>Technology approach:</u> - Provide building Temporary Storage Sites for hazardous and toxic waste that meets the requirements - Temporary storage of hazardous and toxic waste for a maximum of 90 days - management of hazardous and toxic waste with third parties that have licensed from relevant government agencies	During the operational of PT Agriplus	-	
10	Pests diseases	- Plant maintenance	Plantation Area	Implementation of integrated pests management	Every pests and diseases handling	Survey and identification of pests type and attacks	Every pests and diseases handling

11	Decreased of job opprotunities	- Post-operational workers release	Local people from Villages of Sungai Melayu, Sub-district of Sungai Melayu Rayak and Village of Kemuning Biutak, Sub-district of Matan Hilir Selatan	- Provide an information transparently to the workers, regarding the end of plantation operational & work termination - Do the work termination in appropriate to regulations	Before and after work terminationa	- There are no disputes and disagreement between the community with the company or with the workers in the company. - Workers database	Once during the wrok termination phase
12	Social conflict	Post-operational handling of fixed assets	Local people from Villages of Sungai Melayu, Sub-district of Sungai Melayu Rayak and Village of Kemuning Biutak, Sub-district of Matan Hilir Selatan	- Good engagement and communication with community's leader and public figure - Carried out the land return in appropriate with the agreement	Once during handling of fixed assets phase	There are no disputes and disagreement between the community with the company or with the workers in the company. **Methods**: observation and interviews	Once during handling of fixed assets phase

4.2.3 High Conservation Value (HCV) Management & Monitoring Plans

Threats to HCV can come from the internal scope of land managers or from external factors (community institutions or personal). Threat assessment aims to help the garden manager to overcome internal threats with proper management, and improve the ability to reduce various external threats. The assessment process is used to prioritize the management of HCV areas.

Most of the threats identified came from external factors, including hunting, timber use, and land fires. The threat from internal factors could potentially occur from the application of agrochemicals or over-clearing by LC contractors due to unclear HCV area boundaries in the field (**Table 60**). Identified threats can affect one or more types of HCV. This is because the threat is a threat to the typology of HCV areas that can have more than one HCV value, for example threats to hilly areas not only affect HCV 4, but also to HCV 1 if the area is a habitat for key species.

Table 61: Summary of assessment of threat to HCVA in the assessment area

Current situation/ pressure	Potential impact on value	Cause/Source (potential contribution to pressure)	Note
HCV 1			
Small population of Sunda pangolin *(Manis javanica)*	Medium-high	Hunting	Sunda pangolin habitats are the remaining forests. However, sometimes they go down to oil palm plantations in which they may potentially encounter community.
Reduced population of Müeller's gibbon	Medium	Fragmented habitat to Müeller's gibbon because of land clearing, normally for farmlands	• The remaining species live in Kalanglampung and Semerumbung hills, as well as around Riam Kekalap spring. • Some local community members believe Müeller's gibbon should not be hunted as they tell when daybreak comes.
Reduced population of coucang, tarsius and macaque	Low	Hunting	Often found near community farm huts or in *tembawang*
Reduced population of deer and wild boar	Medium-high	Hunting	Community sees wild boar as pests.
Small population of meranti, keruing and Bornean ironwood	Low-Medium	Logging for construction material	Community already protects the currently forested hills as water catchment. These areas still have RTE plant species such as keruing, meranti, and Bornean ironwood.
Reduced population of Asian leaf turtle and Malayan softshell turtle	Medium	• Hunting • Declined quality of aquatic habitat out of damaged riverbank.	• Some members of local community keep both species. • Some parts of the riverbanks are still naturally/semi-naturally vegetated.
Conflict with sun bear, clouded leopard and (potentially) orangutan	Low-Medium	• Community activities in hill-surrounding areas such as logging or farming. • Habitat damage in Gunung Raya Protection Forest	Potential conflict with community members who own farm huts on the hills and areas adjacent to the protection forest area.

Current situation/ pressure	Potential impact on value	Cause/Source (potential contribution to pressure)	Note
		may cause dislocation of wildlife to the assessment area.	
HCV 2			
Reduced size of forest area in the protection forest area (particularly those overlapping with the assessment area)	Medium	• Use of timber • Land use change into plantation of farm • Policy concerning the changed area status	Areas in overlap with Gunung Raya Protection Forest that are yet to be clearly/definitively delineated.
Broken connectivity of landscape or fragmented corridor			
HCV 3			
Reduced size and declining quality of the remaining forest areas	Low-Medium	• Logging for construction materials • Forest and land fires	• Ex logging area can be found in the remaining forest areas on the hills • Great fires broke down in 1994, 1997/1998 and 2004
HCV 4			
Deteriorating water quality	Low	Residuals out of fertiliser, pesticide and herbicide application, that get carried by surface runoff, as well as land erosion	The river water quality is currently good.
Land conversion along riverbanks.	Medium	• Community farming. • Planting of oil palms along the riverbanks	In general, land cover along the riverbanks is still relatively in a good condition. However, some parts are already degraded or cleared.
River siltation	Low	Land erosion and morpho-erosion	River water quality is currently good. Riverbanks are currently dominated by natural/semi-natural vegetation.
Reduced size and declined quality on the hills and along the riverbank	Medium	• Repeated forest and land fires. • Clearing for farm and plantation. • Use of timber in the remaining forested areas.	• Ex logging area can be found in the remaining forest areas on the hills and along the riverbank. • The remaining forested areas are protected by community as they are water catchments to springs used by community. • Large scale fires in 1994, 1997/1998 and 2004
HCV 5			
Deteriorating quality of river water	Low	• Over clearing during plantation development • Residuals out of fertiliser, pesticide and herbicide application, that get carried by surface runoff	Currently sound river water quality, so that this threat remains potential
Reduced size and declined quality of land cover in water catchment areas, especially in springs used by community as their source of water	Low	• Land clearing in water catchment areas may lead to reduced function of the catchments. • Forest and land fires	• Land cover in the water catchment areas are still in a good condition so that they still function optimally • Large scale fires in 1994, 1997/1998 and 2004

Current situation/ pressure	Potential impact on value	Cause/Source (potential contribution to pressure)	Note
HCV 6			
Damaged/loss of spiritual and historical sites as well as *tembawang*	Low	• Plantation development, especially during land clearing • Over clearing by land clearing contractor	Locations of *tembawang*, burial ground and sacred sites have been made enclave by PT AGP, but no clear boundary marks are seen down the field

The purpose of HCV management is to protect HCV area elements from damage, as well as to maintain or enhance their value or function. HCV management plan must aim at protecting and managing HCV areas and elements. The management and monitoring recommendations in this study are not specific because they only refer to the main threats in each type of HCV. However, these recommendations are a reference that must be considered in developing and compiling a more comprehensive HCV Management and Monitoring Plan.

Regard to river borders, the border widths are adjusted to the functions and important values contained in each river Based on legal aspects, all rivers in the study area are categorized as small rivers, so the required river border width is 50 m. However, only the main rivers are 50 m wide, namely the Air Putih River and the Sepupuan River. While the width of the border in the creeks is 30 m. This width is sufficient for the protection and preservation of rivers in this region (Barclay *et al*., 2017; Lucey *et al*., 2018; and Gumbert *et al*., 2009). The determination and mapping of definitive boundaries of sacred, Tembawang and tomb areas need to be carried out in a participatory manner by involving heirs, traditional leaders, village government and other elements of the community that are related to these areas.

Cross-Value Recommendations

In the wider landscape there are several important areas (HCV) that are outside the PT AGP Location Permit area, for example the HL Gunung Raya area, rivers, or HCV areas in the oil palm plantation concession area around the study area. Management of these important areas can be done with a variety of activities, including through: the establishment of a conservation area management forum in the area; making maps of shared conservation areas; RTE wildlife monitoring is carried out together with each stakeholder; coordinate and cooperate with BKSDA, the Forest Service, or NGOs for handling when wildlife and human conflicts occur; and collaborating with surrounding companies, local communities and village government, such as joint patrols.

See the following general recommendation for each HCVA.

1. Confirm the HCV area. The stages are delineating the HCV area map, verifying the results of delineation, and setting the final result as a HCV area map. The company needs to document this process in an official report on the delineation of the HCV area. The next action is the installation of a HCV management area boundary (HCVMA) and a sign board. Specifically for HCV 5 and 6, HCV area inauguration needs to be done in a participatory manner.

2. Socializing well and on target towards:

a) Internal company (field employees, staff, and members of cooperative partnerships)

b) Nearby communities (land users and traditional institutions)

c) Related agencies (consultation)

3. Prepare a HCV Management and Monitoring Plan, taking into account:

   a) Aspects of species protection, including helping to reduce the breeding of animals, and maintaining wildlife trails or corridors, both between HCV areas and forested areas around the study area

   b) Aspects of HCV area connectivity with local landscapes

   c) Strengthening communication with surrounding companies to jointly develop a HCV management plan and action plan

   d) Involvement of the local community, because the interests and benefits of the HCV are the interests and benefits of all parties

   e) Implementation of procedures and policies that have been available in the company

4. Socializing the existence of the site, the shape of the area, and the importance of the HCV area, including the company's commitment to protect it. This is especially intended for land clearing contractors, company staff and workers, communities, and local governments

5. Develop organizations to manage HCV areas:

   a) Establish a management unit to ensure the effectiveness and achievement of HCV management

   b) Staff training or, if necessary, recruit staff who are competent to manage HCV areas

   c) Making SOPs and HCV management policies

6. Develop HCV management, monitoring and evaluation capacity:

   a) HCV monitoring training: the basics of identifying flora and fauna, measuring water quality, stakeholder involvement and other relevant matters

   b) Consistent implementation of policies and SOPs

7. Develop a system of mitigation and handling of land fires which includes the preparation of SOPs, the formation of a patrol team supported by facilities and infrastructure, training of staff and employees, including coordinating with relevant parties

8. Make a list of stakeholders and communicate it and collaborate with all stakeholders related to the management of HCV areas, specifically HCV 5 and HCV 6.

Table 62: HCV management and monitoring in the area of PT AGRIPLUS

Threat	Management Plan	Monitoring Plan	Monitoring Time	PIC
HCV 1				
Declining key species diversity due to poaching of, among others, pangolin, Müller's gibbon, Sunda slow loris, tarsius, Southern pig-tailed macaque, deer and wild boar.	• Establish information board on poaching prohibition and disseminate information to community and plantation workers concerning the presence of key species. • Enrich food trees in fragmented areas. • Establish HCVA-managing groups whose one of the tasks is monitor threats of poaching of, particularly, rare and threatened wildlife species. • Report and coordinate with Natural Resources Conservation Agency (BKSDA) concerning poaching of protected wildlife species. • Collaborate with Forestry Office and stakeholders in the area of Gunung Raya Protection Forest, e.g. education programmes for local schools in and around the assessment area. • Facilitate village governments in making village spatial plan, especially relating to land allocation for farmlands (farms/plantations).	• Document the information dissemination activity and make minutes of information board establishment. • Monitor vegetation growth (growth percentage) • Regularly (every six months) monitor key species presence. • Document the minute of reporting for BKSDA. • Document every meeting with stakeholders.	• Vegetation Growth & key species presence will be monitored once every six months • Periodic socialization and refreshment will be conducted twice per year • Forest/conservation area patrols are conducted twice per week	• Sustainability Dept. • Conservation Dept • Management Unit
Decreasing small population of meranti and keruing *(Dipterocarpaceae)*, and Bornean ironwood.	• Make Permanent Sample Plot (PSP) to identify standing's annual increment or growth. • Establish information boards on species names and their threatenedness statuses. • Establish information boards on felling prohibition in HCVAs and disseminate the information.	• Monitor vegetation growth (growth percentage) • Make minutes of information board establishment.		
Decreased population of Asian leaf turtle and softshell turtle	• Facilitate village governments in making their village spatial plans, especially relating to allocation of riparian areas for protection areas. • Disseminate information on prohibition of poaching of these species. This includes information board establishment. • Conserve riparian zone as buffer and support to aquatic habitats.	• Document the dissemination of information on the information board establishment and make the minutes. • Regularly (every six months) monitor the presence of key species.		

Threat	Management Plan	Monitoring Plan	Monitoring Time	PIC
Conflict with sun bear, clouded leopard and (potentially) orangutan	• Disseminate information to community and plantation workers on the presence of wildlife species. This includes establishment of information boards on danger signs in locations that probably are used by wildlife species as their corridors. • Make SOP on wildlife conflict mitigation and disseminate this information to the entire staff, all workers and contractors. • Apply the 'buddy system', which is an operational standard where workers should not be alone in the plantation area. • Apply a reporting mechanism known to the entire staff and all workers. Coordinate with the relevant authorities. • Work together with NGOs or conservancies concerning wildlife conflict mitigation. This include training for staff and workers.	• Document the information dissemination activity and make minutes for information board establishment. • Document the SOP information dissemination. • Document reports on encounter with sun bear, clouded leopard or orangutan. • Engage community and local government in patrol activities.		
HCV 2				
Forest's decreased size and deteriorating quality in protection forest (particularly in parts in overlap with the assessment area). Connectivity between fragmented landscapes or corridor fragmentation.	• Maintain the intactness of HCVA through, among others, HCVA gazettement and boundary marker establishment. • Carry out reforestation and rehabilitation in HCVMAs that are already in a cleared or degraded condition (e.g. enrichment of food trees). • Engage local stakeholders such as community, traditional leaders, and village governments to initiate forest protection in hilly areas that serve as refugia to key species, in addition to water catchment. • Facilitate village governments in making village spatial plans with regard to allocation of cultivation and protection areas.	• Monitor HCVA boundaries on a regular basis. • Monitor vegetation growth (growth percentage). • Document every meeting with stakeholders.	• Vegetation Growth & key species presence will be monitored once every six months • Forest/conservation area patrols are conducted twice per week	• Sustainability Dept. • Conservation Dept • Management Unit
HCV 3				
Decreasing size and deteriorating quality of the remaining forest areas.	• Disseminate information on the presence of threatened ecosystems to stakeholders in the assessment area.	• Document information dissemination. • Document meetings with stakeholders.	• HCV boundaries will be monitored twice per year • The engagement with the local community in the context of	• Conservation Dept.

Threat	Management Plan	Monitoring Plan	Monitoring Time	PIC
	• Engage local stakeholders such as community, traditional leaders, and village governments to initiate forest protection in hilly areas that serve as conservation areas. • Facilitate village governments in making village spatial plans in making hills as protection areas. • Prevent against logging activities in HCVAs.	• Regularly monitor HCVA boundaries. • Engage community and local government in patrol activities.	HCV co-management is carried out in the long term by involving multi stakeholders.	
HCV 4 and HCV 5				
Deteriorating water quality Water body siltation	• Establish signboards on prohibition of chemical application along riparian areas. • Establish signs to mark boundaries along riparian areas in which agrochemical use must stop and disseminate this information to spraying workers. • Make sediment traps/gully plugs along the streams or tributaries, particularly in undulating to steep areas. • Construct silt pits (2 x 1 x 1 m) in rolling to hilly areas. These areas include planting areas and both sides of the roads. This activity aims at increasing water retention and infiltration and holding against erosion material.	• Document and make minutes of information board establishment activities and disseminate this information. • Regularly (at least once in 6 months) check water quality at water monitoring points (river's inlet and outlet). • Monitor the physical condition of civil engineering structures.	• River water sampling at the specified point to monitor river water quality is carried out twice a year and will be reported in the AMDAL RKL-RPL • Repair of roads will be carried out by request from the community or or adapted to the needs of the community	• Sustainability Dept. • Management Unit
Deteriorating quality of land cover on the hills and landuse conversion along riparian areas.	• Carry out gazettement of hill and riparian areas as HCVAs and disseminate information to workers and local community on the presence and functions of these areas. • Collaborate with community, governments (village to district levels), neighbouring companies, and NGOs in conservation and protection programmes of rivers and hills as important water catchment. • Disseminate information to workers and land clearing contractors on boundaries of riparian areas to prevent against overclearing. • Facilitate village governments in making village spatial plans, particularly to make riparian areas, spring bank and water catchments protection areas. • Prepare SOP on riparian area protection and management and implement it.	• Regularly monitor HCVA boundaries. • Document meetings with relevant stakeholders. • Monitor riparian area boundaries on a regular basis (at least once in a month). • Assist land clearing contractors and document land clearing process. • Document SOP information dissemination. • Monitor vegetation growth (growth percentage).	• Monitoring of land cover related to conservation and other land cover changes is carried out using satellite imagery per quarter, equipped with ground truthing	• Sustainability Dept. • Conservation Dept.

Threat	Management Plan	Monitoring Plan	Monitoring Time	PIC
	• Enrich vegetation in degraded riverbanks and hills (use of native tree species, or others with deep, strong rooting and thick canopy is recommended). • During replanting period, carry out rehabilitation for hills or riverbanks that has already been planted with oil palms.			
Land fires	• Establish SOP for dealing with fires, including mechanisms for quick response and reporting to the relevant authorities. • Establish taskforce for mitigating and controlling land fires, with support from trainings, facilities and infrastructures. • Disseminate information on the danger or land fires and establish signboards on land fires. • Collaborate with community, village government, and relevant stakeholders to control the use of fires when clearing lands for their farms. • Maintain areas that may potentially function as manmade firebreak such as plantation roads or parit gajah (large channel). • Map water source locations for addressing land fires. • Apply fire information system. This includes drought index-based early warning or others that are based on fire watchtower monitoring, as well as fire potential (Fire Danger Rating System/FDRS).	• Document the SOP information dissemination and record the reports. • Record numbers of fire events and make the minutes. • Coordinate with the neighbouring companies and governments in mitigating land and forest fires. • Patrol on regular basis during dry seasons, i.e. from July to September. • Monitor water discharge at water source locations to anticipate fires. • Document FDRS-related reports.	• Monitoring the completeness of fire fighting equipment is carried out twice per year • Forest/conservation area patrols are conducted twice per week increased intensity in the dry season	• Conservation Dept. • Fire Fighting Dept. • Management Unit
HCV 6				
Degradation or clearing of HCVA 6	• Supervise land clearing activities, particularly in areas near to HCVAs. These should be participatory, in which key stakeholders are engaged. • Develop agreement between the company and local community/stakeholders on HCVA 6 management and protection (including prohibited activities). • Facilitate and allow community to have activities in HCVA 6.	• Document land clearing activities. • Document meetings with key stakeholders.	• Preservation of traditional ceremonies and traditional places is carried out based on requests from local communities	• CSR Dept

4.2.4 Soil and Topography Monitoring Plans

PT Agriplus is located in a hilly area. Areas with certain slopes have been designated as HCV areas or other conservation areas. in the management of oil palm plantations the company has a procedure for this, BGAAGRKS-SOP-05: "Technical Guidelines for Soil and Water Conservation". conservation guidelines for the sloped areas specified in the procedure, are as follows:

Table 63: Types of Soil & Water Conservation based on Area Classification

Area Classification	Types of Soil & Water Conservation
Flat -Undulating	- Cover Crops planting - Empty bunch application - Midrib arrangement - Conservation trench/ rorak
Rolling	- Cover Crops planting - Vetiver planting - Empty bunch application - Midrib arrangement - Conservation trench/ rorak with terrace fort
Hilly	- Cover Crops planting - Vetiver planting - Midrib arrangement - Conservation trench/ rorak with terrace fort - Horse tread - Contour terrace with stop bund
Steep	- Cover Crops planting - Vetiver planting - Midrib arrangement - Continuous terrace with stop bund - Conservation trench/ rorak with terrace fort
Lowlands in each soil slope classification	- Cover Crops planting - Midrib arrangement - Drainage ditch - Hoarding site

4.2.5 Greenhouse Gas Management & Monitoring Plans

Steps to Manage and Increase the Carbon Stock

a. Land Use Change / New Planting

Land conversion appeared as the largest emission factor contributing to 19,878.99 tCO_2e

Target	:	Reduction of emissions from land clearing activities
Action Plan	:	‣ No land clearing of conservation and forest area ‣ Management plan of conservation areas ‣ Development of fire mitigation and completion of firefighting equipment

b. Carbon Crop Sequestration

Carbon crop sequestration contributes to emissions reductions to -12,588.81 tCO_2e

Target	:	Incease of carbon crop sequestration
Action Plan	:	‣ Use of seeds with high production potential ‣ Use of land cover crops

c. Fertiliser

Emission source: manufacturing of the fertilizer and its application on the field.

Target	:	Emission reduction from fertilizing
Action Plan	:	‣ Leaf & soil analysis to obtain the data of optimal amounts of fertilizer applied; ‣ Empty bunch used for mulching (composting) ‣ Fertilizers application technique based on topography ‣ proper fertilization dose, right time and place, and in accordance with the Good Agricultural Practice

d. Diesel Consumption in Operation

Fuel Consumption in the field contributed to 482.48 tCO_2e

Target	:	Reduction of emission from Diesel Consumption in Operation
Action Plan	:	‣ Good maintenance of vehicles and other equipment, periodically ‣ Safety of driving related training

e. HCV Crop Sequestration

Crop sequestration from the conservation area appeared as the largest emission reduction factor, contributing of -847.25 tCO_2e

Target	:	Increase of carbon sequestration
Action Plan	:	‣ Rehabilitation on the Conservation Areas which has open land and/or bushes as a land cover ‣ To monitor the Conservation Area from any other activities ‣ Work with the local community to protect the Conservation Area

In order to reduce carbon emissions when the plantation has finished the land clearances, and it continuous to operation and producing the FFB, the company will send its FFB to mills under one company group. Where in this mill there will be an installation for POME management, at least a belt press system.

Monitoring of the Action Plan implementation

a. Land Use Change/ New Planting

Monitoring of land clearing

Action Plan	Time Line
To monitor the plans for land clearing and its realisation	January 2022 – December 2023 (During land clearing phase)

b. Carbon Crop Sequestration

Monitoring carbon crop sequestration

Action Plan	Time Line
To make sure that seed is good quality and with a government license	January 2022 – December 2023 by QC Dept.
To monitor the realisation of oil palm planting & legume cover crops	January 2022 – December 2023 by QC Dept.
To minimise the FFB losses	On mature plant by QC Dept

c. Fertiliser

Monitoring fertilizer emissions

Action Plan	Time Line
‣ To monitor leaf and soil analysis activity	Once every 1 year, on April – May by Research Dept.
‣ To monitor empty bunch application for mulching	When its applied by Quality Control Dept.
‣ To monitor plan and realisation of fertilizer application	Every fertiliser application by Estate Assistant and QC Dept.

d. Diesel Consumption for Transport

Monitoring fuel consumption in the operational activity

Action Plan	Time Line
‣ To monitor the fuel consumption of each device and vehicle	Every month by Traction Dept.
‣ To analyse work of equipment compared to its fuel consumption	Every month by Traction Dept.
‣ To monitor planning & realisation of training related with driving safety	Once every 6 months by Training Center

e. HCV Crop Sequestration

Monitoring carbon sequestration of the HCV – HCS Areas

Action Plan	Time Line
To monitor the planning and realisation of HCV areas rehabilitation, where the land cover is grassland or open land	Once every 6 months by Sustainability Dept.

5. References

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Internal Responsibility

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

Gagas Dinamiga Aksenta

Nandang Mulyaha
Team Leader of Assessments
Date: May 2022

Management PT Agriplus

Kamsen Saragih
Director
Date: May 2022

Assessments result document of PT Agriplus
by Gagas Dinamiga Aksenta (Aksenta), will be applied as one of the guidelines
in managing oil palm plantation

Management PT Agriplus

Kamsen Saragih
Director
Date: May 2022

Document of Management Plans of Assessment,
has been proposed and approved by the Management of PT Agriplus

Lim Sian Choo
Head of CSR and
Corp. Sustainability
Date: May 2022

Management PT Agriplus

Kamsen Saragih
Director

Date: May 2022