

ASSESSMENT SUMMARIES and MANAGEMENT PLANS
PT Hungarindo Persada
Sub-District of Sungai Melayu Rayak & Matan Hilir Selatan, District of Ketapang
West Kalimantan Province

1. Preliminary

1.1 Executive Summary

PT Hungarindo Persada (PT HPE) is one of the oil palm plantation companies operating in Ketapang - West Kalimantan. The location permit of PT HPE is covering 3,700 ha which have been opened since 1992 by the illegal mining.

Location permit for development area was obtained in 17 November 2016 with the Decree of the Ketapang Regent No. 676/PEM/2016, regarding the granting of Location Permit of Oil Palm Plantation on behalf of PT Hungarindo Persada located in Sub-District of Sungai Melayu Rayak and Sub-district of Matan Hilir Selatan, West Kalimantan Province.

In line with Bumitama Sustainability Policy and the RSPO New Planting Procedures which came into force beginning 1 January 2010, PT HPE 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 peat 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 July to October 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 29 Nov 2018.

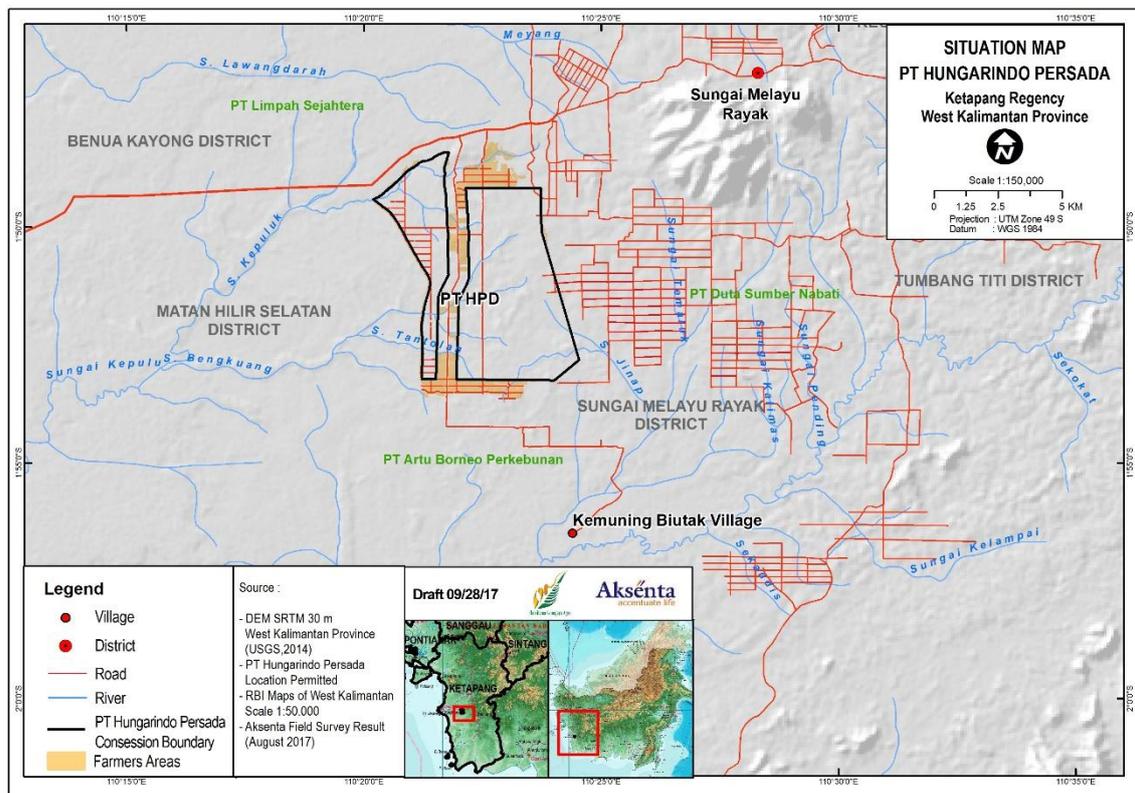
The results of the HCV assessment and LUC analysis had shown that there is no primary forest in the concession of PT HPE. The vegetation's cover is dominated by the shrubs (58.9%). As for potential HCV areas, there is 3 types of HCV were identified in the area of PT HPE. These are HCV 1, 3 and 4, with the total area 290.35 ha (7.75% of Location Permit Area). The important elements for HCV area are the riparian of the damaged river as a result of illegal mining by the community. The HCV areas inside the IUP 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 HPE. 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 Hungarindo Persada (HPE)
Company Address	:	Jalan Melawai Raya No. 10, South Jakarta Jakarta- Indonesia, 12160
Type of business	:	Oil Palm Plantation
Capital Status	:	Foreign Investment (<i>Penanaman Modal Asing, PMA</i>)
Geographical Location	:	1°48'524.3" - 1°53'14.6"S 110°20'12.1" - 110°24'32.2" E See Map 1
Surrounding Entities	:	North : Plantation Area of Farmers Group and PT Limpah Sejahtera South : Plantation Area of PT Arrtu Borneo Plantation and Group of Farmers West : Plantation Area of the communities and PT Duta Sumber Nabati Hutan Produksi East : Plantation Area of Hutan Produksi
Contact person	:	Lim Sian Choo
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Map 1: Location of PT HPE in Sub-district of Sungai Melayu Rayak & Matan Hilir Selatan, District of Ketapang, West Kalimantan Province

1.3 List of Legal, Regulatory Permits and Property Deeds

Table 1: Types of permits and recommendations PT HPE

No.	Licenses and Recommendations	Issued by	Number & Date	Note
1	Deed of Establishment	Kokoh Henry, SH., MKn.	No: 5 Dated: 23 Mei 2011	-
2	Approval the deed of Establishment	Ministry of Justice & Human Rights	AHU-28003.AH.01.01.Tahun 2011 Dated: 06 June 2011	-
3	Last Changes of deeds	Dwi Agung Tursina, S.H., M.Kn.	No: 5 Dated: 16 December 2016	-
4	Approval of Last Changes	Ministry of Justice & Human Rights	AHU-0024705.AH.01.02.Tahun 2016 Dated: 22 December 2016	-
5	Land Information Letter for Oil Palm Plantation	Head of Ketapang District	525/406/DPU-E Dated: 15 July 2016	± 3,700 Ha
6	Permitted Area (Izin Lokasi)	Head of Ketapang District	676/PEM/2016 Dated: 17 November 2016	± 3,700 Ha
7	SEIA Recommendations (Ijin Kelayakan Lingkungan)	Head of Ketapang District	1415/DPMPSTSP-D/2017 Dated: 10 October 2017	
8	Environmental Permit (Ijin Lingkungan)	Head of Ketapang District	1426/DPMPSTSP-D/2017 Dated: 16 Oktober 2017	± 3,700 Ha
9	Plantation Business Permit (IUP-B)	Head of Ketapang District	1454/DPMPSTSP-D.B/2017 Dated: 16 November 2017	± 3,100 Ha

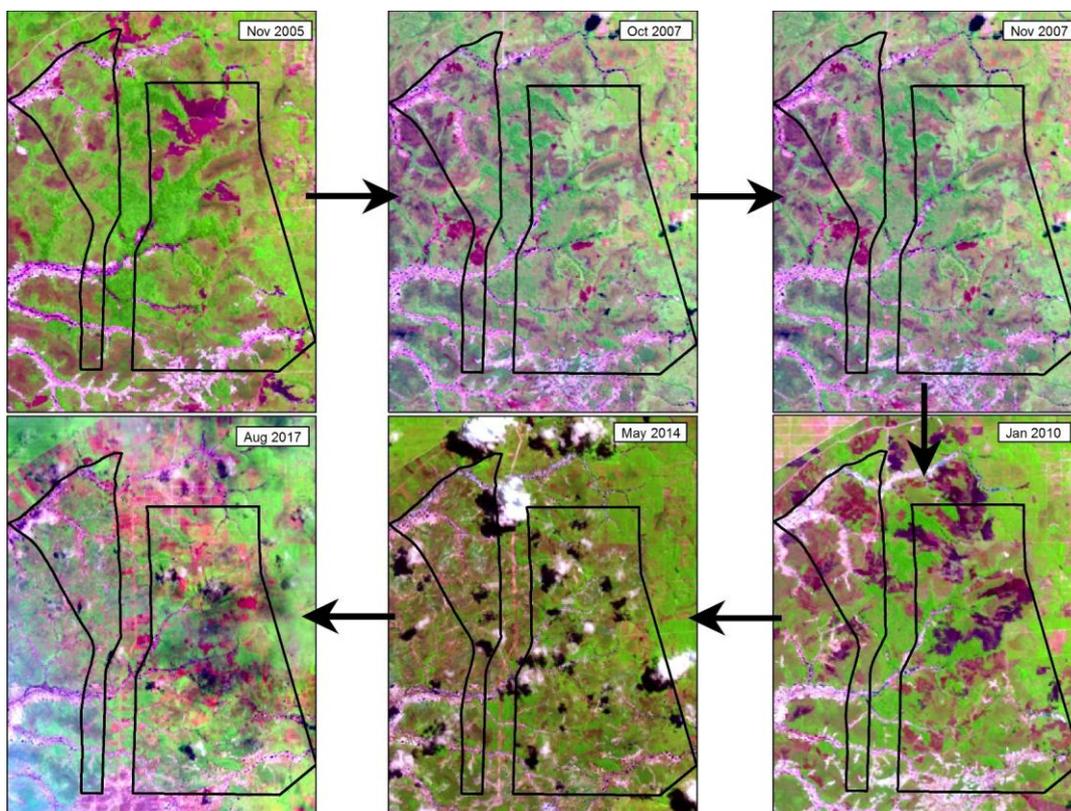
1.4 Historical of Land

Community interaction with the area of PT HPE has occurred since there were a settlement in the village of Sungai Melayu and Kemuning Biutak. The results of land cover analysis and the interviews with local communities indicate that the condition of the area was still a secondary forest on 1996. Unlicensed gold mining was recorded starting in 1997 and in 1998 was the beginning of a drastic change in land cover, both in the area and nearby. Almost all the existing secondary forests are turned into open land due to large-scale timber harvesting and land fires. Large-scale land fires were occurred in 1997/1998, 2003/2004, so at present almost all of the areas suffered severe damage. Forest cover in the form of Primary Forest, Secondary Forest or Young Regenerating Forest has not been recorded in 2005 (Table 2). This increased in 2014, where there was an increase in the intensity of illegal mining and fires in 2015.

Table 2: Land Cover Changes

Land Cover	Nov 2005	Oct 2007	Jan 2010	Nov 2016	Aug 2017
Primary Forest	0.0	0.0	0.0	0.0	0.0
Secondary Forest	0.0	0.0	0.0	0.0	0.0
Young Regenerated Forest (YRF)	0.0	0.0	0.0	0.0	0.0
Old Shrub	652.4	227.4	171.4	18.1	18.1
Shrub	225.5	511.1	486.5	356.5	356.5
Bushes	1,391.7	2,197.4	1,225.0	2,209.6	2,209.6
Open Land	1,255.8	588.2	1,641.3	781.0	781.0
Oil Palm	222.7	224.1	224.1	383.0	383.0

The Community started to plant oil palm in 1998 with an area around 200 ha on the east of the PT HPE. From 2003 to 2007 gold mining activities began to flourish in the study area, especially along the river. They were starting to plant oil palm commodities in the area of PT HPE in early 2015. On 2016, the farmers group of Sawit Maju Bersama was established, they start to plant the oil palm around the area of PT HPE (LUCA Report; Aksenta, 2017). Until the time of the assessment was conducted, illegal mining activities were still ongoing, but on a smaller scale compared to 2012. Mining was currently carried out on ex-ex-mining carried out in the past, especially on water bodies. Meanwhile logging has diminished and oil palm cultivation by the community tends to increase. Satellite imagery shows that in November 2016 (at the beginning of permitted location of PT HPE), almost all permit areas were opened (Map 2), and until the time of HCV assessment was conducted (August 2017), there was no land clearing by the company (Corporate Land Clearance) in the PT Hungarindo Persada permit area (LUCA Report; Aksenta, 2017).



Source: LUCA Report, Aksenta September 2017; Citra landsat 16.12.18

Map 2: Land Cover Changes in the area of PT HPE, from 2005 until assessemnt time process (July – August 2017): it is shown that from November 2016 (permitted location for PT HPE), almost area are opened.

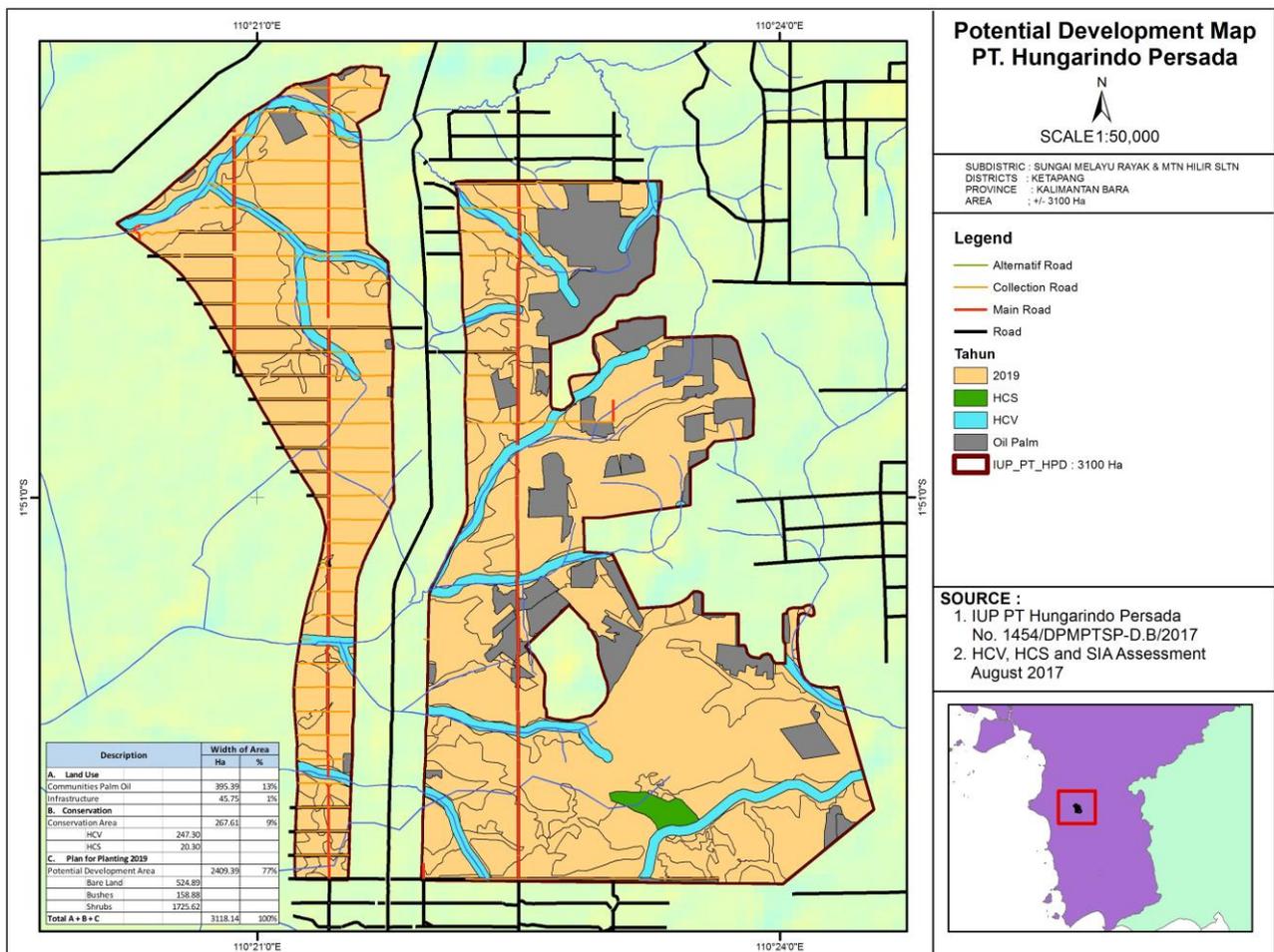
1.5 Area and time-plan for new plantings

The proposed new planting area by PT HPE 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).

Table 3: The summarized of land use and time-plan for new plantings

Description		Area (ha)
A	Land Used	441.14
	Community's Land (oil palm)	395.39
	Infrastructure	45.75
B	Conservation Area	267.60
	HCV	247.30
	HCS	20.30
C	Potential Development Area	2409.39
	2019	2409.39
Total Land Planning		*3118.13

**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 HPE

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 HPE was prepared by consultant from PT Alam Indo Lestari which located in Jln. Dr. Wahidin S, Komp. Batara Indah I Block O No. 13-14, Pontianak, West Kalimantan Province. Webpage: www.alamindolestari.com. It has been approved by Head of Ketapang Regent according to the letter number 1415/DPMPSTP-D/2017, dated 10 October 2017.

Table 4: Person and Expertise SEIA Team Assessor at PT HPE

No.	Name	Position
1	Naveri, S.Hut	Biological Expert
2	Kiki Prio Utomo, ST., M.Sc.	Chemical Physics Expert
3	Ir. Wawan Hermawan	Forestry Expert
4	Endang Mulyadi A.K., S.Hut., M.Si	Socio-cultural Expert
5	Sutriswanto, SKM., M.Kes	Public Expert
6	Eta Fanani AR, S.Hut	Team Member
7	Sulistiani, ST	Team Member
8	Agus Sudarsono, A.Md.Kom	Team Member

2.1.2 Social Impact Assessment (SIA)

The Social Impact Assessment of PT HPE was carried by Aksenta, with the composition of team is as follows:

Table 5: Person and Expertise SIA Team Assessor in PT HPE

No.	Expert Name	Expertise/Position
1	Ali Akbar Hutzi ali.akbar@aksenta.com	Team coordinator, socio-economic, social community and community development
2	Noor Rakhmat Danumiharja noor@aksenta.com	Team coordinator, social relation and community culture
3	Ahmad Arief Hilman hilman@aksenta.com	Socio-economic, communication and community business development

2.1.3 High Conservation Value Identification (HCV)

The HCV assessment conducted on July to October 2017 in the Permitted Area (Izin Lokasi) of PT HPE 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 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 6.

Table 6: Key consultants HCV Assessment

Name	ALS Licence	Position	Expertise
Nandang Mulyana nandang@aksenta.com	Provisional ALS15037NM	Team Leader, socio-cultural assessment (HCV5 and HCV6)	Socio-economic, cultural and environmental surveys
Adhy Widya Setiawan adesahy@gmail.com	N/A	Team member, biodiversity assessment (HCV1- 3)	Surveys of wildlife, wildlife management and ecosystems
Fersely Getsemani Feliggi Salmon getsa@aksenta.com	N/A	Team member, environmental assessment (HCV4)	Hydrology and soil conservation, spatial analysis and remote sensing, water management systems
Zakaria Al-Anshori zakaria.forester@gmail.com	N/A	Team member, flora and ecosystem	Botanical surveys, plant identification
Aulia Bahadori Mukti aulia@aksenta.com	N/A	Team member, soil and environmental assessment	Soil and peat land surveys, soil suitability study, peat conservation
Noor Rakhmat Danumiharja noor@aksenta.com	N/A	Team member, socio-cultural assessment	Legal specialist, forest policy analysis, socio-economic and cultural surveys
Ali Akbar Hutzi ali.hutzi@aksenta.com	N/A	Team member, socio-economic	Socio-economic and cultural surveys, natural resources and environmental economic studies
Nurindah Ristiana indah@aksenta.com	N/A	Team member, GIS specialist and mapping	GIS specialist and spatial analysis, remote sensing and mapping

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 HPE in Sub-district of Sungai Melayu Rayak and Matan Hilir Selatan, 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.

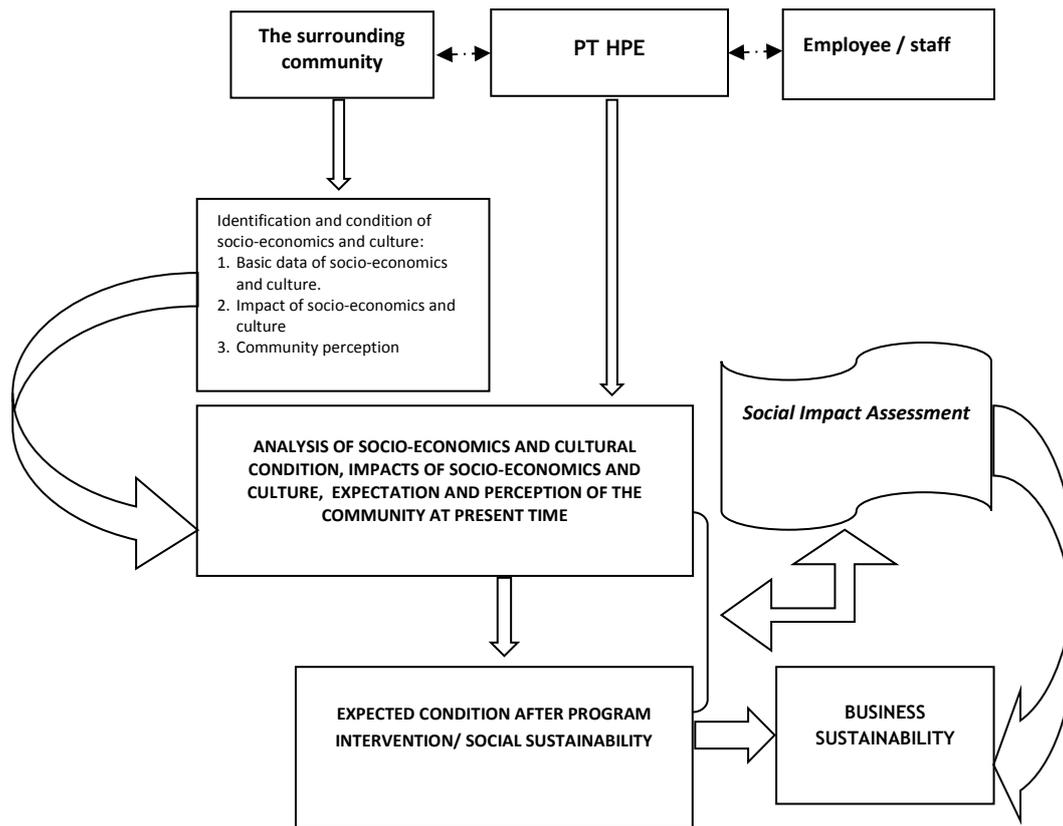
2.2.2 Social Impact Assessment (SIA)

Basically, the development of plantation area would affect the pentagon assets (human capital, natural capital, financial capital, social capital and physical capital) in the surrounding area. The approach of this study of Social Impact Assessment was by learning the present existing condition in PT HPE, particularly the condition which was related to socio-economic condition, socio-economic impacts of the company toward the surrounding the community, and the community's perception. Based on the existing condition, compilation and preparation was conducted for documenting the SIA and social management plan which contain activities that should be conducted to create ideal condition (the desirable condition). Sampling technique being used were purposive sampling (samples were selected on the basis of researcher's judgement; who decided which of those samples were the most suitable to be selected for the purpose and objectives of the research) and simple random sampling (technique of sample collection which gave the same chance for all population elements to be taken). This sampling technique was carried with a participatory, multiparty, rapid ex-ante, appreciative and social-learning cycle approach.

The scope are restricted to the important impact, that considers the number of people affected, the distribution area of impact, duration of the impact, the intensity of the impact, and the number of Pentagon Assets component affected in the villages around the operation of PT HPE.

The secondary data or primary data collected were analyzed by integrating quantitative and qualitative method. Qualitative analysis emphasized more on the description and illustration of various facts and relation between variables being found in the field.

The findings obtained from the methods above were analyzed. The baseline of the analysis was based on RSPO criteria which is relevant to sustainable social aspects. The recommendations also covered other issues which were not in the RSPO criteria, in the form of company's policy, ideas or aspirations as the result of the field analysis.



Flowchart 1: Step of Social Impact Assessment

2.2.3 HCV Assessment

Primary and secondary data used in this study. The secondary data were collected and analyzed at the stage of pre-assessment, while the primary data collected and analyzed during the assessment phase. Pre-assessment stage is including preliminary information gathering and initial data, planning and preparation for the implementation phase assessment more effectively and efficiently. The assessment stage includes data collection, analysis and consultation. The findings on the stage of pre-assessment into basic data collection. This study covers the both stage and six categories of HCV.

A. Secondary Data

The data and information collected from the secondary data consists of a map of the study area and thematic maps of appropriate field of study. To study HCV 1-3, thematic maps concerning the biodiversity of Kalimantan and important species information in the context of current global and national, were compiled, as published by IUCN, WWF, BirdLife International, Ramsar Forum, and Intact Forest Landscape (IFL), and from the Ministry of Environment and Forestry. To review HCV 4, data and maps concerning the physical context from the USGS, RePPPProt, also DEM data processing-SRTM DATA and Landsat imagery were collected. For the social and cultural context of the community, the information collected includes data from BPS (National Statistics Office), maps of RBI (Rupa Bumi Indonesia), and processed Landsat imageries. Other information pertaining to

the situation of social culture in the region of the current study was compiled from a variety of sources that are relevant.

B. Primary Data

Primary data collection was conducted through rapid assessment by ground-truthing, field observations, interviews and consultations with stakeholders. Verification activities focused on those areas which are estimated based on the HCV area map resulting from previous stages (potential HCV map); and other areas in or around the study area that is considered important to be examined, for example to check connectivity (HCV 1-4), comparison of the RTE species presence inside and outside the area of study. The focus of the data and information collection were aimed at attributes or elements of HCV, using a combination of several methods: 1). Participatory mapping). 2). Ground truthing and field data collection, 3). In-depth interviews with the community in the study area, 4). Consultation with stakeholders.

Assessments of HCV 1-3 were conducted by purposive sampling and area sampling with regard to: (i) habitat quality assessment (in combination with the results of flora study), (ii) Direct and indirect observations of wildlife (e.g. tracks, faeces, scratch marks), sounds, hair/feathers and nests), and (iii) interview with local communities, with selected resource persons (e.g. hunters). Due to the quick survey tend to have limitation, the selected taxa were the visible and abundant taxa, based on information about the distribution of the species, to be indicators of habitat diversity and allows for relative abundance of the key species. Data collection of flora and fauna as a whole using the method of recce walks only by direct observation in the study area.

Data collection for herpetofauna was conducted by opportunistic exploration on day and night. The methods used are Visual and Auditory Encounter Survey (Crump & Scott, 1994 in Heyer *et al.*, 1994). Data collection was done by two people or groups, for an average of 6 hours from 07:00 to 13:00, and + 3 hours in the evening from 18:00 until 21:00. The data recorded includes the species and the number of individuals.

For HCV 3 identification, the Indonesian Toolkit for HCV Identification (Konsorsium, 2008) was used. In the revised Toolkit, an ecosystem is considered endangered if it meets one or more of the following criteria:

1. An ecosystem that has lost 50% or more of its original extent in the bio geographical region where it occurs.
2. An ecosystem that will lose 75% or more of its original extent in the bio geographical region where it occurs, based on the assumption that all areas currently allocated for conversion in existing spatial plans will be converted.

An ecosystem that fits the following criteria is considered rare:

3. A natural ecosystem that covers less than 5% of the remaining natural vegetation cover in the bio geographical region where it occurs

The toolkit states that “if the data and/or human resources available are inadequate to conduct an assessment using the analytical approach, as described in Table 8.3.3, the assessor can use a precautionary approach described in Table 8.3.4, with reference to the HCV 3 status of ecosystems described in Table 8.3.1 and 8.3.2”. Therefore, the Precautionary Principle was used to Identify HCV 3.

Data collection for HCV 4 was conducted by focus on the object types. Verification was focused on potential HCV areas (purposive sampling). On any object types, basic questions to be answered were the value, functionality, and environmental services, that were very important and what can be provided by the study object. Each findings must be equipped with: (i) toponymy, (ii) site description, (iii) current status (e.g. types and intensity of utilization), (iv) the threat and potential threat, (v) coordinates, and (vi) photographic documentation. In addition, field observation also check links between water catchment areas, controlling erosion, and network streams, as well as data gathering through interviews with the selected resource persons, followed by a triangulation process.

Identification of HCV 5-6 was conducted in conjunction with local communities using FPIC (Free, Prior and Informed Consent) principle. HCV 5-6 field data collection was carried out using interview with purposive and snowball sampling, with following criteria: (i) community that traditionally uses the natural resources in the study area, (ii) local communities that have interaction (culture) with land or natural resources in the study area, (iii) the history of the natural resources utilization by the community. Data and information gathering also conducted with a Focus Group Discussion with key questions and direct observation at selected locations with potential HCV.

i. In-depth Interviews with the Community In the Study Area

Information about the presence of HCV attributes and elements also compiled through interviews with selected resources, i.e. local community or company employees as well as key figures who have knowledge or experience with the natural environment in the study. Information on the HCV attribute or element included the current occurrence and historical occurrence). For this secondary information, verification and validation process through a triangulation always conducted, i.e. the process of checking the truthfulness and accuracy of the information provided from one informant to other informants. Verification or validation was also conducted by comparing data and information from the informant with reliable references.

For HCV 5-6, interviews were focused on local community living in villages closest to the study area, which were the beneficiaries the area HCV5-6. Interview for HCV 5 intentionally (*by design*) is not conducted to people outside the local villages, because this was participatory, the decisions over an area as HCV 5 or not will be determined by the beneficiaries community.

ii. Consultation with Stakeholders

Consultation with stakeholders is conducted through informal meetings or formal meetings. Consultations with stakeholders through informal meetings were conducted on all study stages, from preparation/pre-assessment, field study, and in the drafting the report process. The consultation was carried out with the method of in-depth interviews, participatory mapping, discussions and field visits. Consultation with stakeholders through formal public consultation meeting to present the stakeholders the results of the study. Formal consultation conducted with the

presentation and discussion. Stakeholders involved in the consultation are grouped based on relationship and stake/ interests with study and object area.

Public consultation activities were conducted in each stage of the activity. Public consultation in the form of face-to-face meetings with key stakeholders in the study area, both from the surrounding communities (community leaders, village government), district agencies, relevant regency government agencies, non-government agencies who work in the surrounding study area, as well as plantation companies in the surrounding area (Table 3).

The purpose of the public consultation were to: (i) deliver findings from the field and the analysis from the HCV assessor team, (ii) obtain data and additional information and clarification on the field findings, and (iii) obtain input for the report preparation and recommendations as well as preparation of the HCV management plan.

Table 7: Stakeholder groups and consulting approach

Stakeholders	Consulting approach
Surrounding communities: - Community who use ecosystem services or products - Community who owns land /tenants	- Consultation during the field survey (in-depth interviews, participatory mapping)
Organizations and institutions that represent local communities: - Village government - Village customary institution - On site company management representatives - District government	- Consultation during the survey fields (interviews, participatory mapping) - Presentation of interim outputs, followed by discussions
Environmental organizations and academia - NGOs activities around the study area - Researchers or university teachers	- In-depth interview - Discussion of the results
Relevant regency level government agencies - Environment Agency (BLHD) - Forestry agency, Plantation Agency - BKSDA (biodiversity agency)	- Presentation of the field study and interim outputs - Discussion on the results

C. Data Analysis and HCV Area Mapping

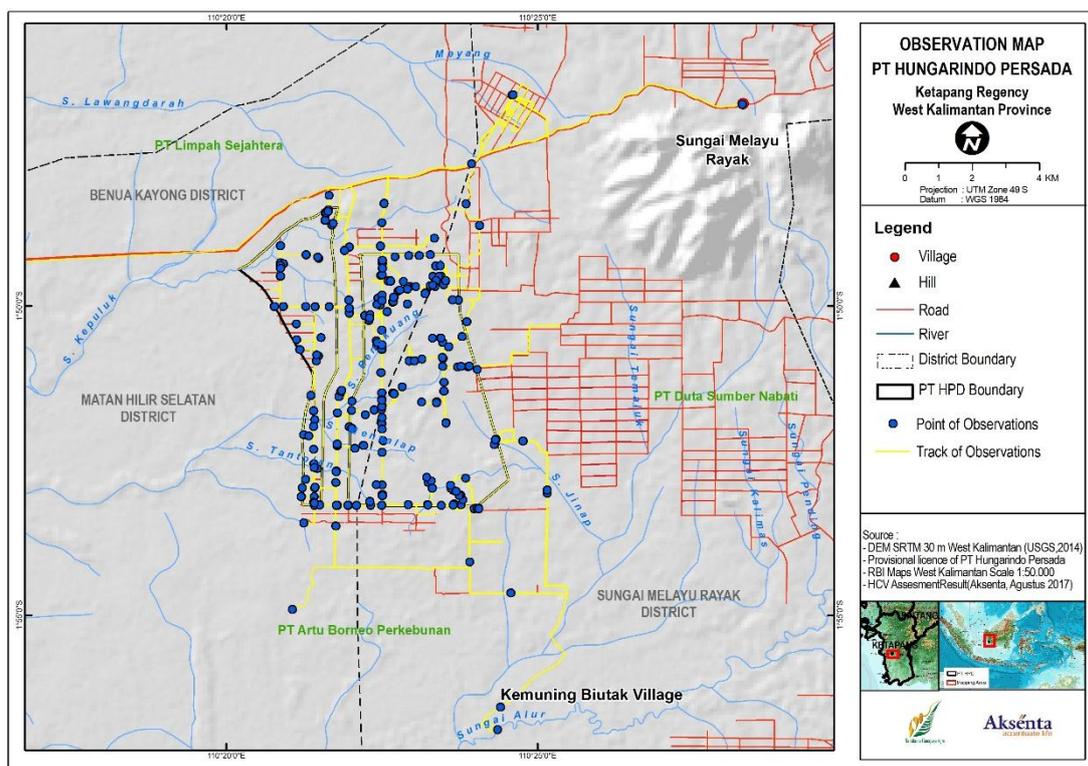
All coordinates of the area which have elements or attributes of HCV were mapped (Map 4). Information on the description of HCV attributes or elements were used to identify HCV areas, in conjunction with the interpretation of satellite imageries. The characteristic for biodiversity and HCV socio-cultural area, are in the form of similar land cover or ecosystem types (e.g. forests, secondary forests, shrubs, rubber agroforestry, lakes, rivers, swamps). For HCV environmental services, the characteristics can be either steep slope areas, rivers and streams, riparian buffers, open water bodies, or swamp areas (lowlands, basins).

The HCV indicative maps were mapped out for each study object. There are three map output in the form of, (i) HCV indicative map of biodiversity (HCV 1-3), (ii) HCV indicative

map of environmental services (HCV 4), and (iii) HCV indicative map of social culture (HCV 5-6). Furthermore, all three were combined into HCV indicative map.

HCV 3 presence was determined by ecosystem mapping. In Indonesia, the distribution of ecosystem types is defined by climate, soil/hydrological characteristics, human influences and landform features within a biogeographical unit. The RePPProT (Regional Physical Planning Programme for Transmigration) mapping program conducted by the Government of Indonesia in the 1980s defined and mapped 414 land systems in Indonesia that describe topographical, geological, climate, and hydrological factors, as well as soil and resident species. RePPProT land system classes can be combined with land cover and topographical maps to create a map of ecosystem types, and to estimate their past, present and future extent (Consortium to Revise the HCV Toolkit for Indonesia, 2008).

To produce the HCV definitive map, follow-up field survey was conducted, in form of delineation (taken coordinates points in the field) over the HCV boundaries. The delineation results subsequently mapped out as revision of the HCV indicative area resulting from this HCV study.



Map 4: The observation point and survey location in the study area

D. Significant Dates in Chronology of Assessment

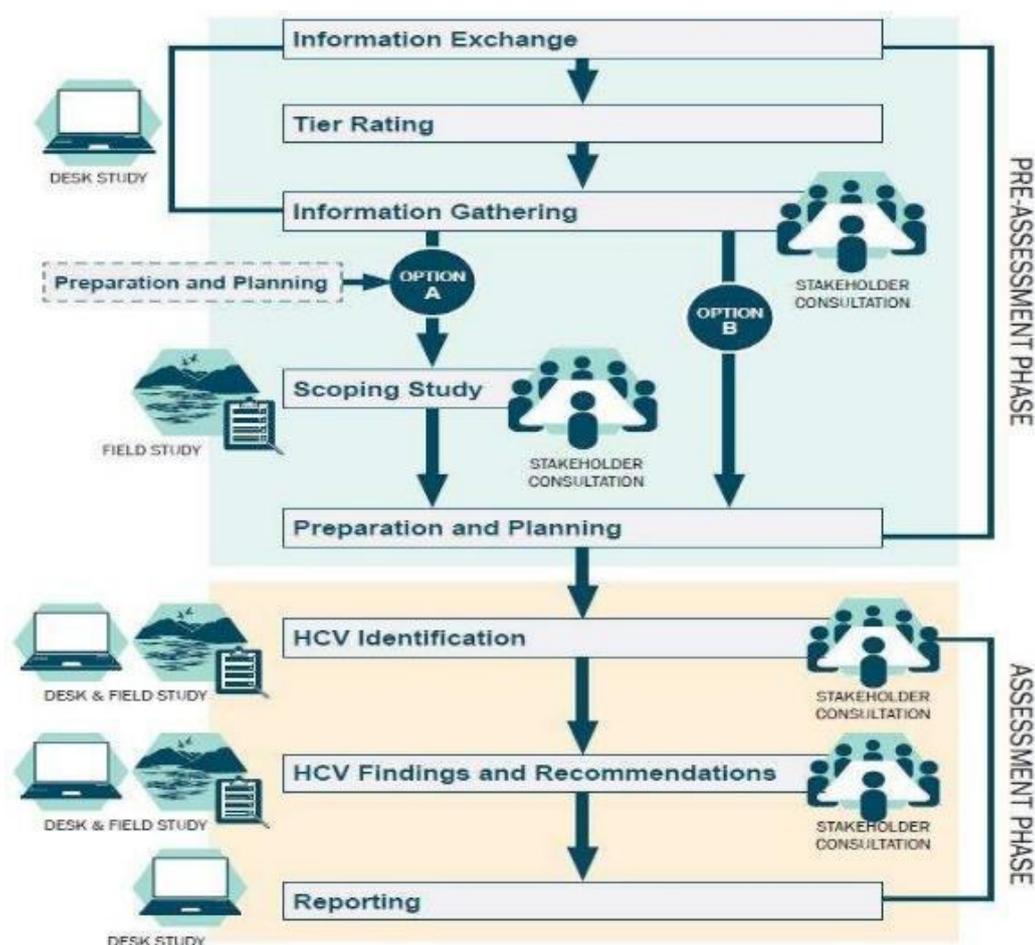
The HCV assessment was carried out in the period of July-October 2017. A step-wise screening approach was used to align the required information according to the reference scale. Assessment of HCV 1-3 began with studies of references in global, regional and national level, then verified with field observation. HCV 4-6 is assessed with emphasis on landscape or local level, then verified through field observation. The assessment includes (i) pre-assessment (exchange of information, information gathering, selection of key

information, rating assessment, coverage study, field survey pre assessment, preparation and planning; (ii) assessment (field data collection, consulting with stakeholders, threat assessment); (iii) assessment post field survey (data analysis, HCV area mapping, reporting preparation). Summary of the schedule is below on **Table 8**.

Table 8: HCV Assessment Schedule for PT Hungarindo Persada

Stages	Purpose	Activities	Schedule
PRE-FIELD SURVEY			
<i>Pre-assessment and preparation</i>	<ul style="list-style-type: none"> Identify potential and existence of attributes or elements of HCV Identify HCV potential areas Better understand the landscape context Find out the issues of conservation and potential threat to HCV Set methods, surveys plan, assessment team, and schedule of field survey 	<ul style="list-style-type: none"> Gather preliminary data and information from the company about the status of the development and management of unit 	05 July – 02 August 2017
		<ul style="list-style-type: none"> Gather preliminary data and information from secondary sources (reports, journals, books, statistical data, basic maps) and resource persons 	
		<ul style="list-style-type: none"> Perform data analysis and spatial analysis 	
		<ul style="list-style-type: none"> Scooping Study/Field surveys pre-assessment 	20-22 July 2017
FIELD SURVEY			
<i>Opening meeting</i>	<ul style="list-style-type: none"> Convey the intent and purpose of the HCV assessment Obtain data and information on the status of the development and management of unit Build understanding regarding HCV management unit: background, intent and purpose, concepts, types of HCV, attributes or key elements, and methods of identification Form a work team (HCV assessment team + management unit team as counterpart) and agreed on schedule 	<ul style="list-style-type: none"> Workshop with the company's management unit Compile time schedule and allocation of supporting facilities and infrastructure for field survey Training for company management unit 	04 August 2017
<i>Participatory mapping</i>	<ul style="list-style-type: none"> Clarify potential HCV areas from pre-assessment with stakeholders Gather data/information on the existence of attributes or elements of HCV 	Workshop with resource persons, from company staff and local community who have knowledge and experience about the study area	04 August 2017
Field survey	<ul style="list-style-type: none"> Verify the existence of attributes or elements of HCV Identify HCV areas and indicative borders Identify threats and potential threats to HCV 	<ul style="list-style-type: none"> Check land cover in the field Field data collection through interviews with triangulation 	04-16 August 2017

Stages	Purpose	Activities	Schedule
<i>Stakeholders consultation</i>	<ul style="list-style-type: none"> Convey the finding results / HCV identification to stakeholders (communities, local governments, NGOs) Obtain input, additional information and clarifications on the existence of attributes or elements of HCV and the threat or potential against HCV Obtain input, additional information for preparing recommendations and options for management plan and monitoring HCV 	Face-to-face meetings with key stakeholders in the study area, from surrounding communities (community leaders, indigenous figures, religious figures, community), government agencies (local village, BPD, subdistrict), relevant institutions at regency level (BKSDA, Environmental Agency, Plantation Agency), interview with local non-governmental institutions/NGOS working around the area studies (Yayasan Palung Ketapang), as well as companies operate around the study area.	16 August 2017
<i>Closing of the meeting</i>	Delivering results of HCV identification to the management unit	<ul style="list-style-type: none"> Presentation and discussion The submission of Interim report 	16 August 2017
POST-FIELD			
Analysis and reporting	Presents results of HCV assessment in a systematic format that meet scientific norms, coherent and simple to understood by management unit as the primary user of report	<ul style="list-style-type: none"> Data analysis Spatial analysis Report writing Report finalization 	20 August-24 October 2017



Flowchart 2: Step of High Conservation Value Assessment

2.2.4 Land Use Change Analysis

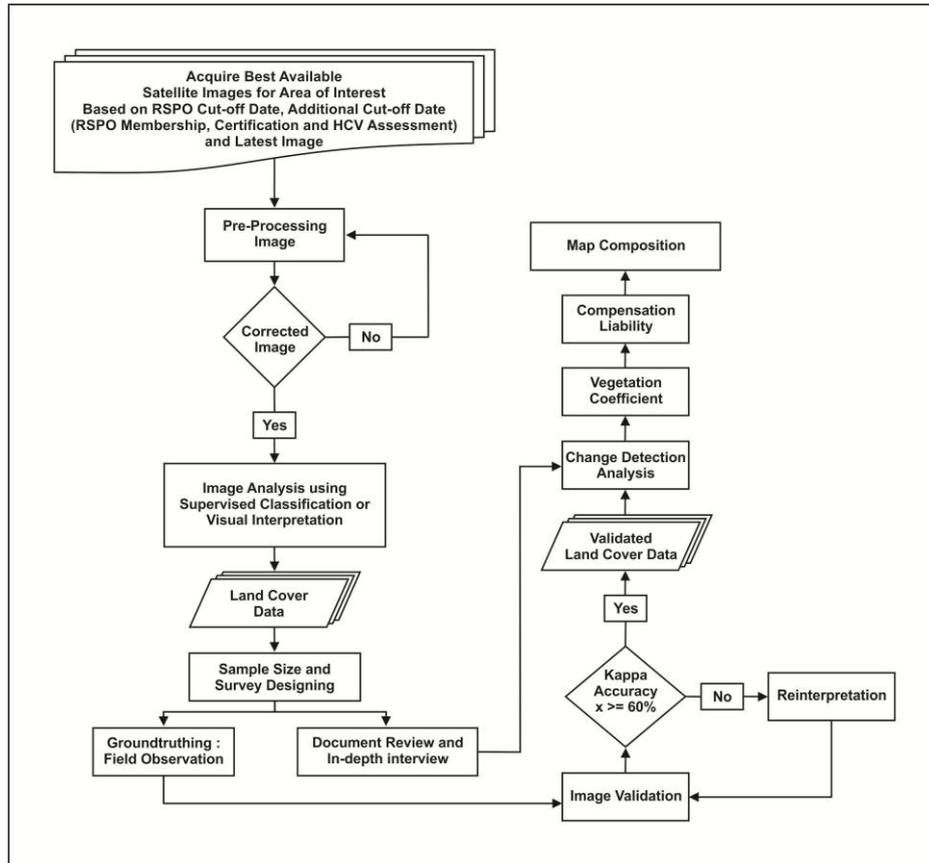
PT HPE also conducted Land Use Change Analysis (LUCA) to ensure that there is no deforestation due to land development. LUCA of PT HPE was conducted concurrently with HCV Assessment in July to October 2017.

Using the satellite image of Citra Satellite Landsat TM 5, Landsat 7 ETM+, 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 9: Time Series of Satellite Imagery used for LUCA

Period	Date of Acquisition	Cloud Over (%)
Before 1 November 2005 (Baseline)	1 July 2004 18 August 2004	<5% (haze) 5-10%
1 November 2005	6 September 2005 3 December 2005	0% 40-50% (striping)
1 December 2007	28 September 2007 9 May 2008	30-40% 0%
1 January 2010	1 September 2009 16 February 2010	0% 5-10% (striping)
9 May 2014	24 April 2014	5-10%
Identification of HCV Area	31 March 2017 24 April 2017 11 June 2017	0% (haze) <5% (striped) 20-30% (striped)
After becoming RSPO member (if relevant)	28 September 2007 9 May 2008	30-40% 0%
After the management unit acquired	N/A	N/A
Latest satellite image used for ground truthing	31 March 2017 24 April 2017 11 June 2017 21 June 2017	0% (haze) <5% (striped) 20-30% (striped) 10-20%
Land Cover Monitoring periodically	13 June 2018	
The NPP Document submitted to RSPO	08 February 2019	

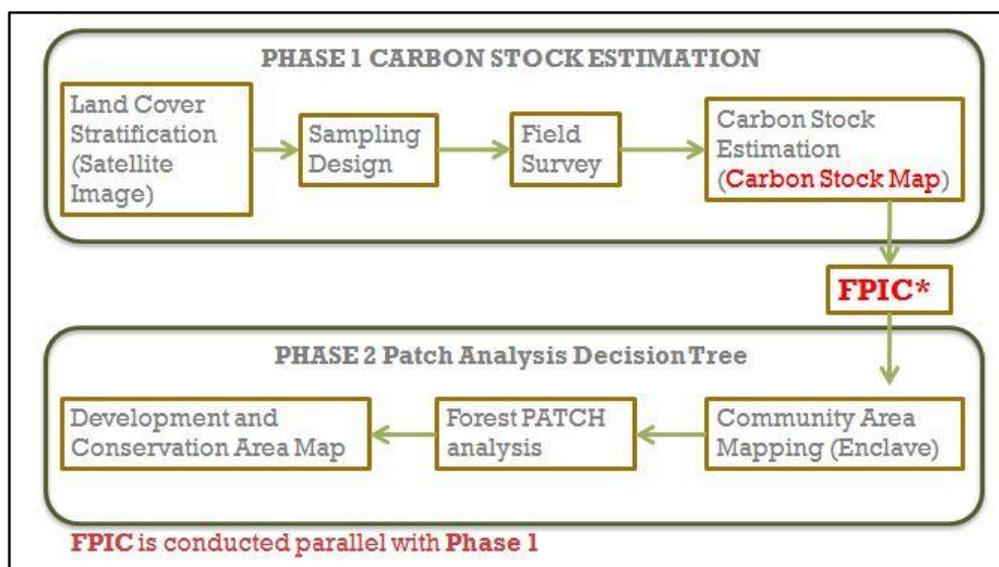
LUC Analysis was performed by four steps, namely (1) Image Preprocessing, (2) Image Classification, (3) Field Verification, (4) The Compensation Scheme. Refer to the following flowchart:



Flowchart 3: Step of Land Use Changes Analysis

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 4: tages and phases of the HCS study process in The HCS Approach Toolkit

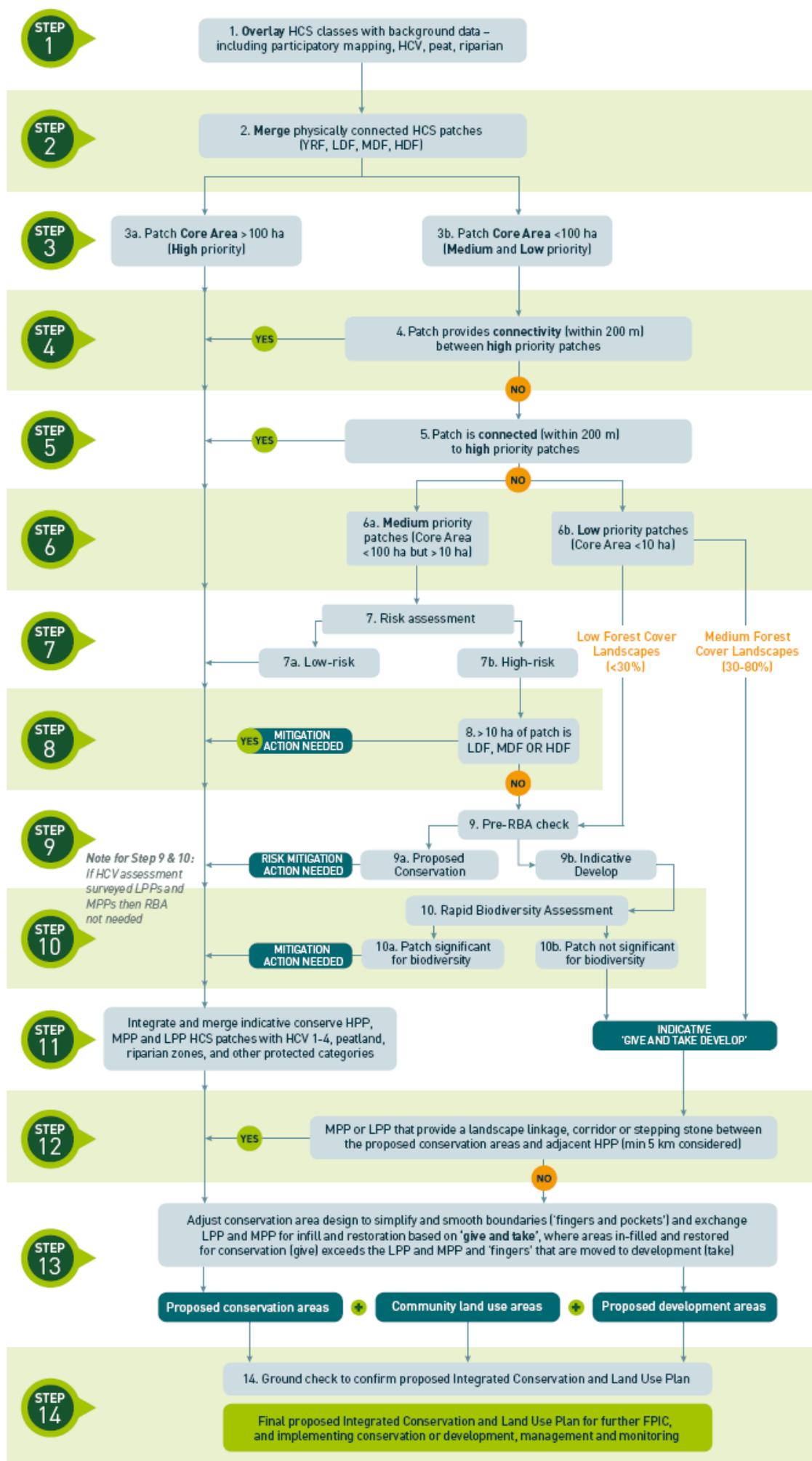
The first phase is the classification stage of land cover types and identifies areas of forest that have the potential to be HCS. The stage of classification of land cover types and determination of the location of samples is carried out through analysis of satellite imagery. This information then becomes 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 Satellite Imagery 8 Path 121/Row 61, acquisition date: 27 February 2017 and 16 June 2016. Classification of land cover was carried out by unsupervised classification technique and continued with visual correction of both satellite images.



Flowchart 5: 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 HPE in Sub-district of Sungai Melayu Rayak and Matan Hilir Selatan, 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 HPE, 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 HPE.

The implementation of environmental monitoring will be carried out by PT HPE. 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 HPE is located in the Village of Sungai Melayu, Sub-district of Sungai Melayu Rayak, and Village of Kemuning Biutak, Sub-district of Matan Hilir Selatan, District of Ketapang, West Kalimantan Province.

The Village of Sungai Melayu is the capital city of Sungai Melayu Rayak Sub-district. This village has a high level of accessibility and passed by the provincial roads that connects the District of Ketapang with several sub-districts in the East of Ketapang, while the Village of Kemuning Biutak is a remote village (60 km from the office of Matan Hilir Selatang Sub-district), the village has no public road

except by the river, and road which built by the oil palm companies.

The kinship system in these villages is a geneological village type, ie villages that formed and have the same lineage (ancestors). While the pattern of dispersion of settlements, is a centralized settlements and the rest is Cluster Village.

Table 10: Villages and Population in the Study Area

No.	Village	Sub-district	Area (Km ²)	Population		Density (People/Km ²)
				People	Householder	
1.	Sungai Melayu	Sungai Melayu Rayak	35.00	2,429	464	69
2.	Kemuning Biutak	Matan Hilir Selatan	212.20	1,389	342	7

source: Kec. Sungai Melayu dan Kec. Matan Hilir Selatan Dalam Angka, 2016 (BPS, Kab. Ketapang)

Table 11. Ethnic and religious composition in the villages around PT HPE

Village	Sub-district	Ethnicity	Religion
Sungai Melayu	Sungai Melayu Rayak	Indigenous people: Dayak Pesaguan Migrants: Jawa, Cina, Bugis dan Madura	Katholik (80%), Protestan (12%), Islam (8%)
Kemuning Biutak	Matan Hilir Selatan	Indigenous people: Dayak Kendawangan Migrants: Jawa, Cina, Bugis dan Madura	Katholik (85%), Protestan (10%), Islam (5%)

source: Kec. Sungai Melayu dan Kec. Matan Hilir Selatan Dalam Angka, 2016 (BPS, Kab. Ketapang), dan hasil wawancara Aksenta (2017)

Table 12: Socio-economic Conditions at the villages around plantation

	Pemenuhan kebutuhan Pokok masyarakat																										
Livelihood	<ul style="list-style-type: none"> • Farming, oil palm plantation, and other agricultural plantation (rubber). The need for food that comes from nature (forest) has been replaced with the purchase • As a workers at oil palm company • Income as a member of partnership program 																										
Accessibility, Transportation, Communication and source of energy	<ul style="list-style-type: none"> • The road conditions for these villages are asphalted and concrete rebars, but there are still roads with lateritized soil and stone boulders. They are accessible on all seasons, both with two-wheeled vehicles and four-wheeled vehicles. • These two villages are already covered by cellular phone signals. Communication in peoples can be done directly. • The electricity services from PLN is not yet available for 24 hours, except in the capital city of the district. For the needs of electric energy, people use village or private generator, and the solar cell from the government. • Oil fuel can be obtained easily in both villages. • For cook, most of people used LPG, but there are small people who still use firewood. 																										
Education and Health	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2">No</th> <th rowspan="2">Village</th> <th colspan="4">Number of Schools by Level</th> </tr> <tr> <th>TK</th> <th>SD</th> <th>SMP</th> <th>SMA</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Sungai Melayu</td> <td>1</td> <td>2</td> <td>1</td> <td>1</td> </tr> <tr> <td>2</td> <td>Kemuning Biutak</td> <td>1</td> <td>1</td> <td>-</td> <td>-</td> </tr> </tbody> </table> <ul style="list-style-type: none"> • Health Facilities at the Village of Sungai Melayu and Kemuning Biutak are sufficient, there are community health centers with Midwife and Nurse health personel. • Most of medicines are obtained from the purchase. However, there are peoples who still use the traditional herbs as a drug, the material can obtained from around the settlement. 					No	Village	Number of Schools by Level				TK	SD	SMP	SMA	1	Sungai Melayu	1	2	1	1	2	Kemuning Biutak	1	1	-	-
No	Village	Number of Schools by Level																									
		TK	SD	SMP	SMA																						
1	Sungai Melayu	1	2	1	1																						
2	Kemuning Biutak	1	1	-	-																						

Pemenuhan kebutuhan Pokok masyarakat	
Water source (for consumption and sanitation)	<ul style="list-style-type: none"> • Water source for consumption is obtained from springs, wells, rainwater and refills. While for sanitation people use water from wells and rivers. During the dry season, people buy water for sanitation. • In the Village of Sungai Melayu, most of the need for clean water comes from the springs of the Belaban Tujuh Protection Forest • In the Village of Kemuning Biutak, most of the need for clean water comes from dug wells or pump wells. For sanitation needs, especially during the dry season using river water.

Source:

- Interview & field verification by Aksenta (2017)
- Kecamatan Sungai Melayu Dalam Angka 2016, dan Kecamatan Matan Hilir Selatan Dalam Angka 2016; (BPS, Kab. Ketapang; 2016)

a. Key Issues:

Table 13: Key Issues Impact of PT HPE

No	Activity	Positive Impact	Negative Impact	Potential Positive Impact	Potential Negative Impact
INTERNAL					
1	Recruitment and Management of Employees	Improvement of welfare (+FC)		Improvement of welfare (+FC)	
		Opportunities to build organizational mental & improve proficiency in working in the company (+HC)		To have a work experience that could increase "selling point" of each individual. (+HC)	
2	Nursery, planting, maintenance and harvesting.	For daily workers still earn income to achieve minimum target income in accordance with the government regulation. (+FC)	Social jealousy among workers due to the unambiguous attitude of the foreman against other workers who are not disciplined against the hours of entry to work (-SC)	Improved skills as a palm oil plantation worker (+HC)	Late PPE procurement has the potential to productivity decrease due to illness or work accident. (-HC dan -FC)
EXTERNAL					
1	Partnership	-	- Additional income when the partnership plantation already mature. (+FC) - Masyarakat akan terlatih berorganisasi dalam koperasi (+HC) - Marjinal land will be more productive with oil palm plant by the company. (+NC)	-	-
2	Recruitment and	- The salary earned improves welfare	-	-	If the company stop the operation, there

No	Activity	Positive Impact	Negative Impact	Potential Positive Impact	Potential Negative Impact
	Management of Employees	(+FC) - Work experinecs and improvement of skill (+HC)			will be potential unemployment of productive age. (-FC)
3	Land Acquisition	The peoples receive land compensation from the marginal land they have left behind (+FC)	-	-	-
4	Land Clearing	- Contractor earns income and experience of project work (+FC) & (+HC) - Construction of roads and bridges for the benefit of the company but can be utilized by the public (+PC)	-	-	-
5	Planting and Insertion	-	Marjinal land will be more productive with oil palm plant by the company (+NC)	-	-
6	FFB Transportation	-	Contractors have the opportunity to earn income and experience of project work (+FC) & (+HC)	-	The transport mobility of FFB potentially damages the road infrastructure (-PC)

Note:

(+FC) positive impact to *Financial Capital*

(-FC) negative impact to *Financial Capital*

(+PC) positive impact to *Physical Capital*

(-PC) negative impact to *Physical Capital*

(+HC) positive impact to *Human Capital*

(-HC) negative impact to *Human Capital*

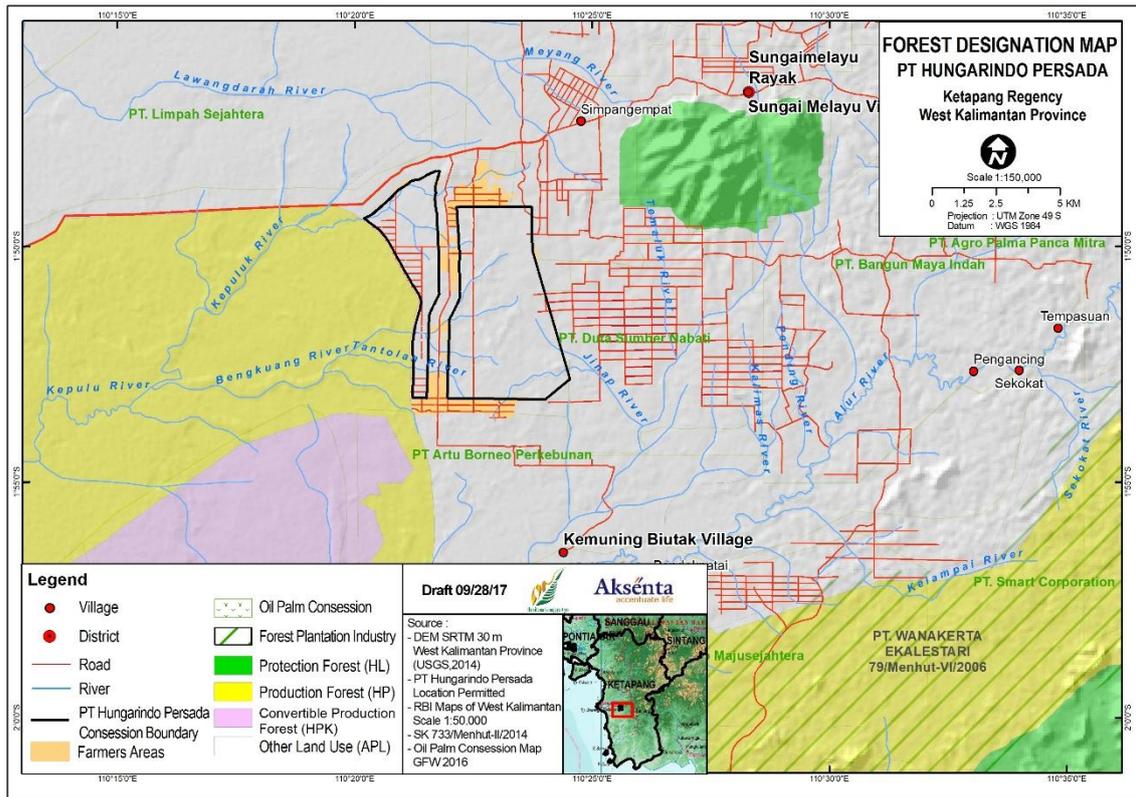
(+NC) positive impact to *Natural Capital*

(-SC) negative impact to *Sosial Capital*

3.3 HCV assessments

PT HPE is located in the Pesaguan watershed, which is part of the Pawan River Region. Based on Sub-basin boundaries, this region is the upstream part of the Kepuluk and Temaluk Sub-watersheds. The river that cross along the area are Kepuluk River, Bengkuang River, Tentalan River and Jinap River. However, rivers have been degraded by unlicensed gold mining activities.

Based on the letter from Head of BPKH Region No. S.488/BPKH.III-2/2016, dated 21 June 2016, about Telaahan Teknis Fungsi Kawasan Hutan Terhadap Pencadangan Izin Lokasi Perkebunan atas nama PT Hungarindo Persada, stated that the permitted location of PT Hungarindo Persada (HPE) for an area 3,700 ha is located on othe usage areas (Area Penggunaan Lain, APL), and there is no overlap with permits in the forestry sector and is not indicated to be in a moratorium on peatlands and primary forest moratorium based on Ministry of Forestry (SK.733/Menhut-II/2014).



Map 5: PT HPE on the Map of Area Status and Land Use

3.3.1 National and Regional Context

The study area is located on the island of Kalimantan, an island with rich tropical biodiversity types of habitats. In the island, there are 225 species of land mammal with 44 endemic species (Payne *et al.*, 2000); 639 bird species, with 358 species include resident species and 37 endemic species (MacKinnon *et al.*, 2000), 166 species of snakes (Stuebing, 1991), between 140-150 species of amphibians (Inger and Stuebing, 1997), 394 species of fresh water fish with 149 endemic species (MacKinnon *et al.*, 1996) and many other species of fauna. Some species of animals unique of this island, are Borneo Orangutans (*Pongo pygmaeus*), Proboscis Monkey (*Nasalis larvatus*), Sunbear (*Helarctos malayanus*), Sunda Clouded Leopard (*Neofelis diardi*), Bornean Bay Cat (*Catopuma badia*), White-shouldered Ibis (*Pseudibis davisoni*), Storm's Stork (*Ciconia stormi*) and Bulwer's Pheasant (*Lophura bulweri*).

Based on the distribution of plant species, Borneo Island is an island with tropical rain forest rich in biodiversity. Of the 267 species of *Dipterocarpaceae*, 155 of them are endemic species of Borneo, making Kalimantan Island became center of diversity in the *Dipterocarp* world. Some species of flora have been protected by Indonesian regulations, especially the family *Dipterocarpaceae* (*Shorea spp.*, *Vatica spp.*) and some other species, such as *Dyera* (*Diera costulata*) and Banggeris (*Koompassia excelsa*), as well as the pitcher plants (*Nepenthes spp.*).

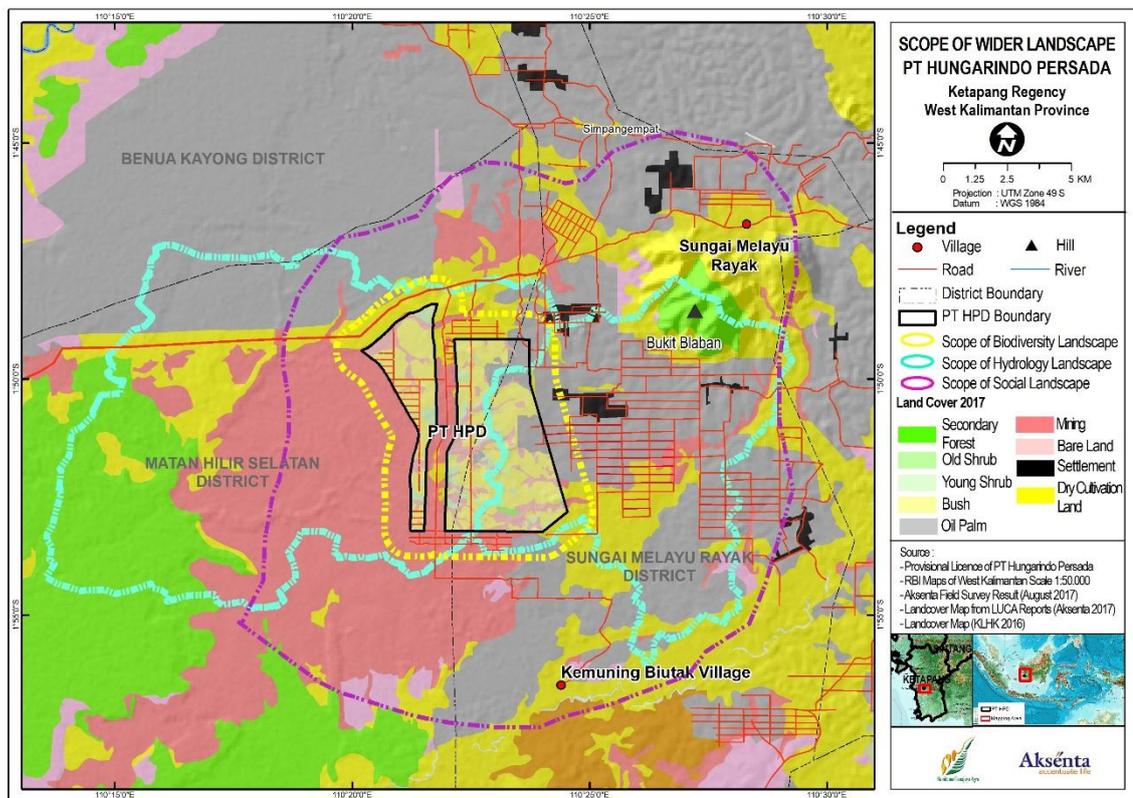
In addition to regulating and enforcing the species protection, Government has also allocated nature conservation areas. In the province of Kalimantan Barat, nature conservation areas are, i.e., four national parks, five nature reserves, seven nature tourism parks, one wildlife sanctuary and one water conservation. The government has also facilitated the regulation of essential ecosystem region (KEE – *Kawasan Ekosistem Esensial*), such as KEE Sungai Putri in Ketapang Regency.

Some international organizations have identified key areas for biodiversity with their own criteria. Some of the key areas that existed in Kalimantan and internationally recognized are:

- a. **Important Bird and Biodiversity Areas (IBA)**; the nearest IBA is Cagar Alam Muara Kendawangan and Gunung Palung National Park, both of them located approximately 70 km from study area. Both IBA are part of Key Biodiversity Areas (**KBA**) in Indonesia, which nationally identified sites of global significance (Langhammer, *et al.*, 2007).
- b. **Endemic Bird Areas (EBA)**; Similar to the IBA, the nearest EBA are Cagar Alam Muara Kendawangan and Gunung Palung National Park. EBA Gunung Palung National Park (ID 157) is an EBA *Bornean Mountains*, whereas EBA Muara Kendawangan (ID S100) is the *Bornean Coastal Zone*.
- c. **Ramsar Site** ; in Borneo there are 2 Ramsar Sites, namely Danau Sentarum National Park is approximately 330 km to the Northeast, and Tanjung Puting National Park, 250 km to the Southeast. Both Ramsar Sites are too far from the study area. Based on Indonesian Wetland Sites (Wibowo & Suyatno, 1998), there are no significant wetland areas located near PT HPD.
- d. **Heart of Borneo (HoB)**; HoB is located approx. 200 km North-East. The HoB is the major Intact Forest Landscape (IFL) on the island of Borneo.

3.3.2 Landscape Context

The landscape boundaries were obtained from the aggregation of biodiversity, hydrology, and social landscapes boundaries. The landscape limit of the study area were set based on the existence of natural ecosystems and/or locations that are potentially as wildlife habitat particularly areas that have connectivity with potentially HCV areas within the study area; If these areas are not found, then use the limit of 1 km from the boundary of the study area. The landscape boundaries of environmental services are defined based on watershed (DAS) boundaries or sub-basin that covers the study area. Landscape limit of social studies set based on the boundaries of the smallest administrative area of the study area (village); When the village territorial boundaries are not available or invalid, then the radius boundaries used with nearest to settlement (kampung) in the study area (Map 6).



Map 6: The boundaries of the study on the wider landscape

According to the Ministry of Forestry Decree 733/Menhut/2014, the study area is non forestry designation (*Area Penggunaan Lain* - APL). Except for the western side of study area which is Production Forest (Hutan Produksi), other sides are APL and already open land or palm oil plantations, either managed by companies or individuals or groups of smallholders.

The Moratorium map (Peta Indikatif Penundaan Pemberian Izin Baru - PIPPIB) revision XI 2017 by the Ministry of Forestry shows that in the study area there are no primary forest or peatland areas. The nearest moratorium area is 5 km northeast, protected forest of Bukit Blaban (Hutan Lindung Bukit Blaban), while nearest peatland from moratorium map is about 5 km west from the study area.

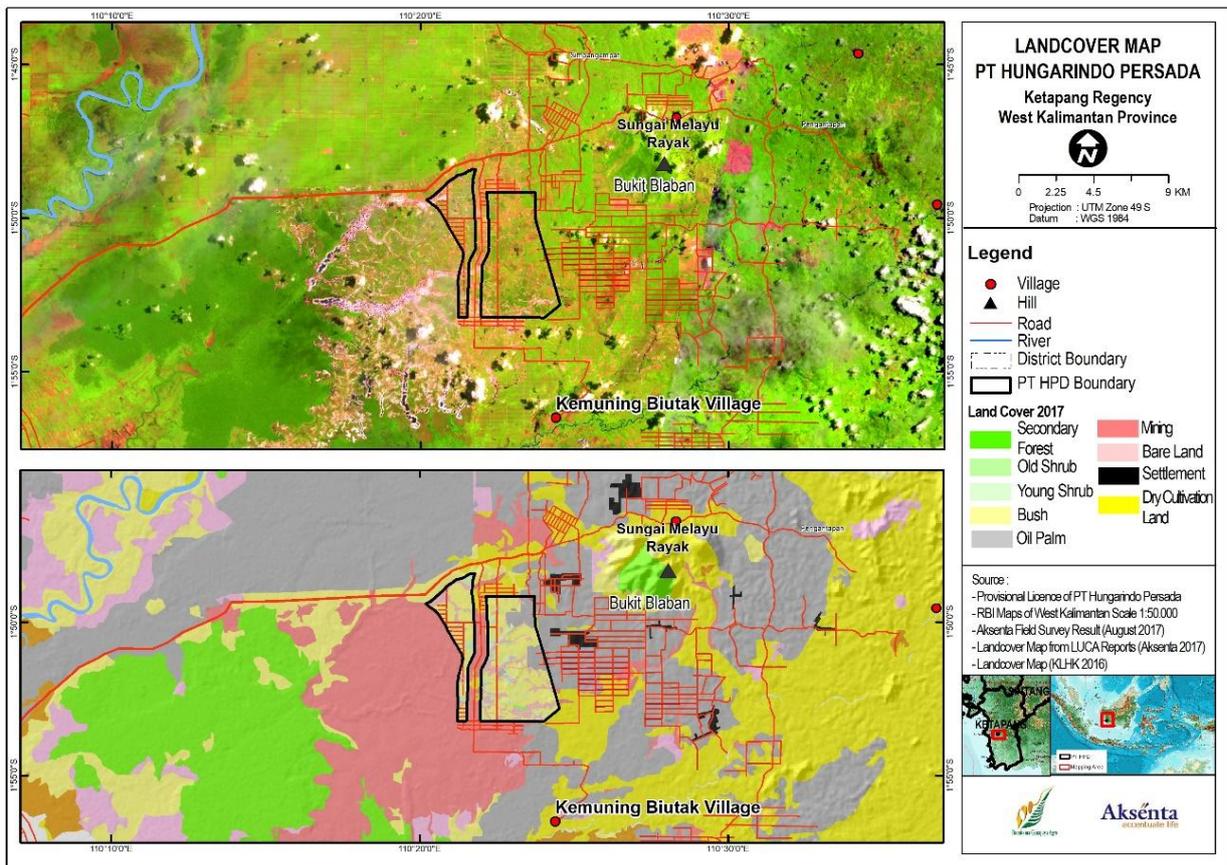
The study area also outside the peat hydrology area maps (Kawasan Hidrologi Gambut - KHG). The nearest KHG area is ± 1.4 km northwest of the study area, included in the KHG

Sungai Pawan – Sungai Kepuluk. Based on the landscape hydrology boundary, the KHG area is located in the western part of sub watershed of Kepuluk and covers 42% of the sub watershed or 27% of the total area of the landscape.

Based on the land use change analysis report (Aksenta, 2017), the natural vegetation cover in the study area has severely degraded over the last 10 years. A recovery process does not occur due to continues mining activities and repeated land fires. Illegal mining activities started in 1997, and large scale land fires occurred in 1997/1998, 2003/2004 and 2015, and therefore almost the entire study area has become severely degraded. The former mining areas subsequently turned into sandy wastelands.

Land cover conditions at the time of the assessment consist of shrub, old shrubs, bushes, open land and palm oil. The land cover conditions indicate that human activity in the study area is high, especially logging, mining and palm oil plantation (Map 7).

Forest cover in the form of Primary Forest, Secondary Forest or even old shrubs/ Young Regenerating Forest, has not been found within the Provisional License area of PT HPD since the last 12 years (LUCA Report, Aksenta, 2017).



Map 7: Land Cover map in the study area

3.3.3 Biodiversity Context

The nearest biodiversity conservation area is Cagar Alam Muara Kendawangan (Muara Kendawangan Nature Reserve), approximately 70 km from the study area. Cagar Alam Muara Kendawangan has an area of approximately 150,000 ha and is the largest natural reserve in

the province of Kalimantan Barat. Between this conservation area and study area, are cultivation areas and forest areas that have been heavily degraded. There are no natural corridors that connect between the study area with both conservation areas.

According to Wetland International¹, Cagar Alam Muara Kendawangan is large areas consist of lowland swamp forests of 65,000 ha peat swamp forest, 75,000 ha freshwater swamp forest, and 10,000 ha of mangrove forests. In the natural reserve, it has been recorded 94 species of birds and 10 species of mammals. Endangered wildlife species in the CAMK include *Helarctos malayanus*, *Hylobates albibarbis*, *Lutra sumatrana*, *Nasalis larvatus*, and *Pongo pygmaeus*. Plant research by Tahan Uji (2003), it is recorded 219 species, consist of 140 plant species of which have been known for building materials and medicinal plants. Six species of *Aquilaria ardesiacus*, *Eusideroxylon zwageri*, *Durio oxyleanus*, *Alstonia scholaris*, *Kompassia ardesiacus* and *Eurycoma longifolia* are listed species in the IUCN Red List.

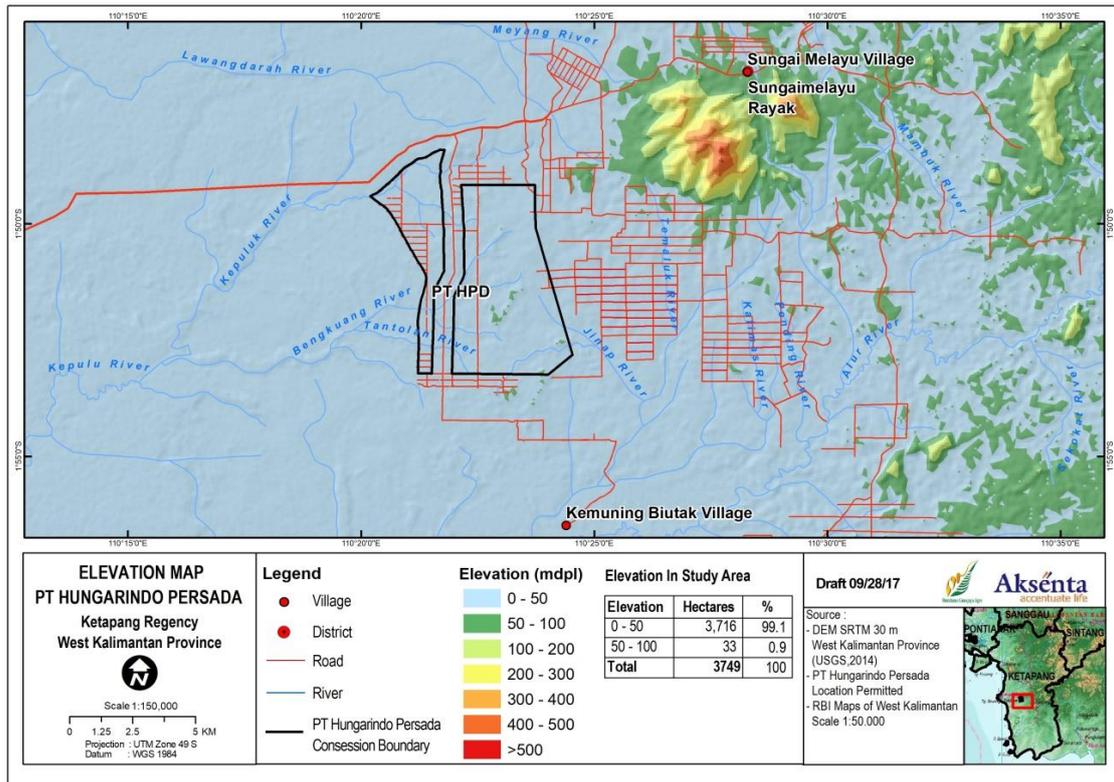
According to the IUCN global map for the distribution of rare and endangered species, the study area included in the distribution of Orangutans (*Pongo pygmaeus*), Proboscis Monkey (*Nasalis larvatus*), Bornean Gibbon (*Hylobates albibarbis*), Sunda Pangolin (*Manis javanica*), Flat-headed Cat (*Prionailurus planiceps*), Spiny Turtle (*Heosemys spinosa*), Great River Tortoise (*Orlitia borneensis*), False Gharial (*Tomistoma schlegelii*) and tree species of the family *Dipterocarpaceae*. The distribution of Bornean Orangutan sub-species have been mapped by Banes (2016), and on the map the study area appears to be the distribution of *p. pygmaeus wrumbii*. This distribution map gathered data from secondary sources and not all from field survey, therefore the use of the map requires verification.

3.3.4 Context of Physical Environment

The study area is located in Pesaguan watershed which is part of the Sungai Pawan system. Rivers in the study area, among others, Sungai Kepuluk, Sungai Bengkuang, Sungai Tentalan, Sungai Jinap. Nevertheless, these rivers have been heavily degraded due to zircon gold mining activities without permission.

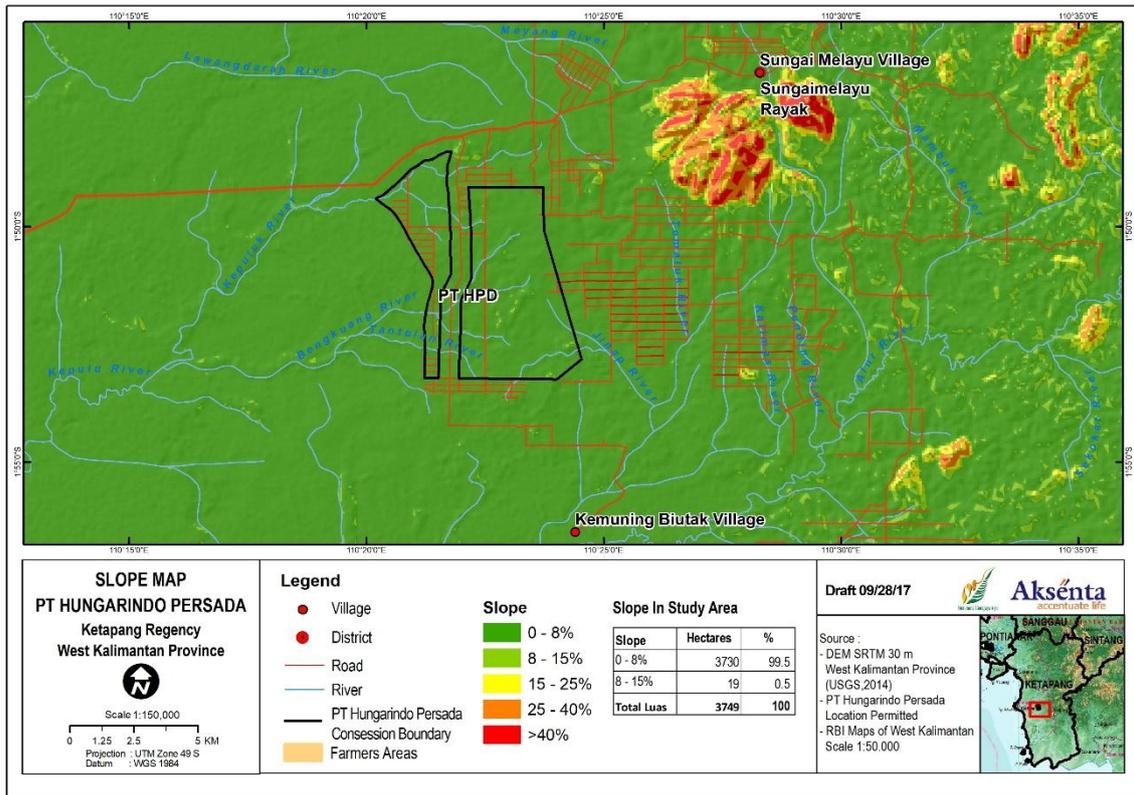
The climate of the study area is tropical wet climate studies, included in the type Am based on the Köppen climate classification (Koppen, 1900 in Kottek *et al.*, 2006). This means that the study area experienced a short dry season and its annual rainfall is high enough so that the soil is relatively humid. The average annual rainfall is 2,276 mm/year. The dry months (CH < 60 mm) occurred in August and September. While the rest of the Moon is wet (CH > 100 mm) with the peak of the rainy season in November and December. Naturally, the vegetation cover on this climate type is tropical rain forest.

Profile of the topography in the area studies are relatively uniform. Almost all (99%) region is located at an elevation of < 50 m above sea level (Figure 6). These areas is flat area which has a slope 0-8% (Map 8). Therefore, naturally, the potential erosion of the region's land belongs to low. As for the sloped area is in the Northeast region of the study, namely in the area of protected forest Bukit Blaban.

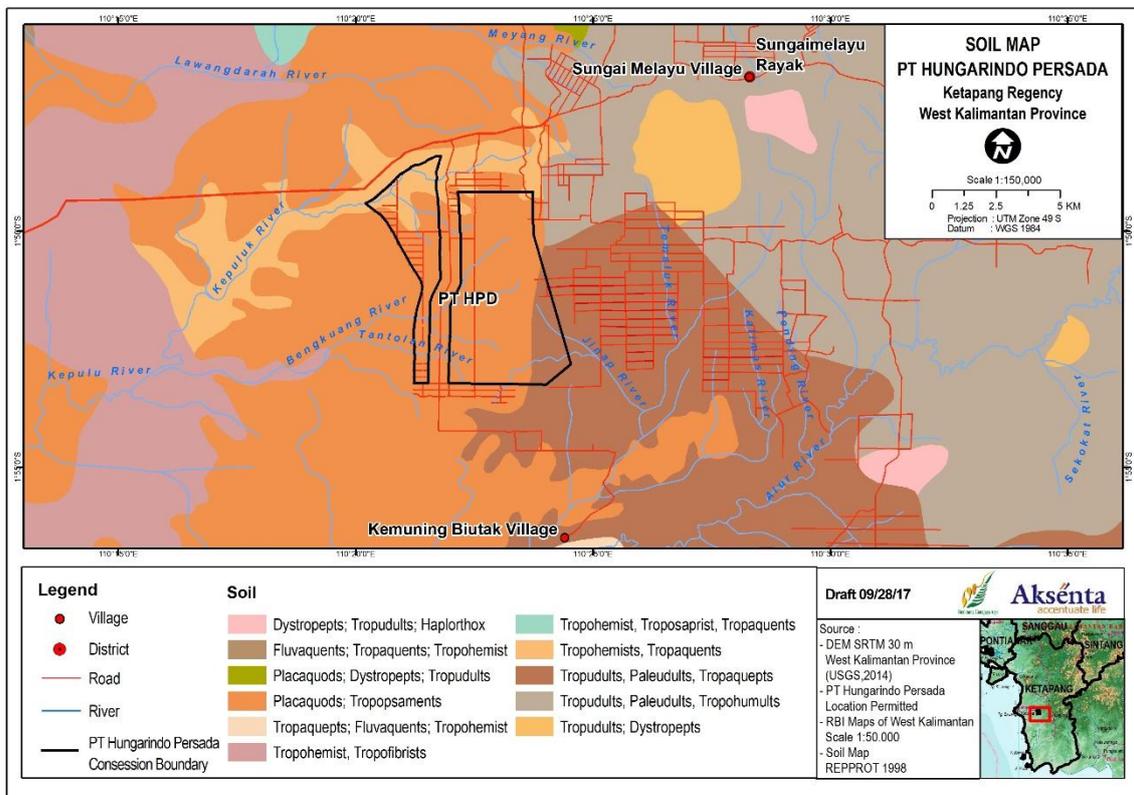


Map 8: The topography in the study area and its surroundings

The type of soil in the area of study is composed of three land Association (RePPPProT, 1989), namely: (i) *placaquods* and *tropopsamments*; (ii) *trophemists* and *tropaquents*; and (iii) *tropodults*, *paleudults*, and *tropaquepts* (Map 9). The soil Association is *placaquods* and *tropopsamments* is a sandy soil dominates (78%) of the study area. The soil Association *trophemists* and *tropaquents* covers 10% of the study area in the northern part around Kepuluk River basin. While the soil Association *tropodults*, *paleudults*, and *tropaquepts* are found in the western part of the southern region-a review with a coverage area of 12% of the total area of study. The domination of the land of *placaquods* and *tropopsamments* indicate that the region's soil has a low fertility, reacted sourly (pH 3-5), as well as have the ability to retain water.



Map 9: Slopes in the study area and its surrounding



Map 10: Soil types on the study area and its surrounding

3.3.5 Socio-Cultural Context

Demographic and Socioeconomic

Administratively, the area of PT HPD is in the village of Sungai Melayu, Sungai Melayu Rayak subdistrict, and village of Kemuning Biutak, district of the Matan Hilir Selatan, Ketapang regency, Kalimantan Barat province. Sungai Melayu village has more population than village of Kemuning Biutak (**Table 10:** Villages and Population in the Study Area, page 22).

The main livelihood of the residents of the village, include farming (with commodities, rubber, palm oil and vegetable), farming (beef, chicken and pork), and worked as a laborer in palm oil plantations around the study area. In addition there are also trades, such as opening a grocery store, a restaurant, a garage, and transport services (table 14).

Table 14. Socio-economic and cultural villages in the area of study

	The fulfillment of the basic needs of the community	
	Kemuning Biutak	Sungai Melayu
Livelihood	<ul style="list-style-type: none"> • Cultivating rice and vegetable gardening and rubber. • Palm plantations and labor or as a member of the smallholder scheme Note: food needs are sourced from nature (forest) has been replaced with the purchase 	<ul style="list-style-type: none"> • More variety include: tillage with the mainstay of palm oil, trade and services (workshops, public transport) • Palm oil plantations and labor or as a member of the smallholder scheme Note: food needs are sourced from nature (forest) has been replaced with the purchase
Accessibility, transport, communications and energy	<ul style="list-style-type: none"> • The way the estate with road conditions laterit, but still there are accessible throughout the season (year), with either two-wheel vehicles or four wheels. • The road between the village already concrete rebates • Affordable mobile phone networks but not yet covered all regions of • Electrical installation from PLN already installed but still waiting for electrified. The time of the study, the community is still using genset , as well as solar panels (solar cell) from the Government. • Fuel can be obtained easily. • Fuel for cooking most already use LPG gas, but there is still a small community who were still using the firewood and kerosene. 	<ul style="list-style-type: none"> • Main roads have largely been paved, a small portion of laterite in damaged condition, and the road between the settlement already concrete rebates. • Most of the villages have been reached by mobile phone signal • Electric service was already available from PLN, but there are still communities that use the genset village or genset , as well as solar panels (solar cell) help from the Government. • Fuel can be obtained easily • Fuel for cooking most already use LPG gas, but there is still a small community who were still using the firewood and kerosene.
Education and health	<ul style="list-style-type: none"> • Means of education: there is 1 kindergarten and elementary, JUNIOR HIGH and high school level to be found in the village of Sungai a Malay • Health facilities in the form of clinics and <i>Poskesdes</i> Helpers with Nurse Midwives 	<ul style="list-style-type: none"> • Educational facilities available from kindergarten up to high school (kindergarten, 2 , elementary school 1, 1 junior and 1 senior high school) • Adequate health facilities, there are Parent Clinics, health centers and

	The fulfillment of the basic needs of the community	
	Kemuning Biutak	Sungai Melayu
	and health workers.	Auxiliary health worker with Poskesdes doctors, midwives and Nurses
Food (Carbohydrates and proteins)	The food (both as a source of carbohydrates or proteins) obtained from the results of the purchase in the market and cultivation. There is no Community which extracts food directly from the nature)	
Water (for the needs of consumption and sanitation),	<ul style="list-style-type: none"> Water for consumption is obtained from springs, wells, rainwater, and refill. Water for sanitary purposes (PUBLIC) using the water of the river Pesaguan which is in the South, outside of the area of study 	Most of the drinkable water (consumption) and for sanitation (PUBLIC) obtained from springs in the protected forest of Bukit Blaban streamed (pipelines). Fraction using well water, rain water, and refill.
Medications	Most of the necessities the medicines obtained from the results of the purchase, only a small part of the residents who use traditional herb as medicine, and those are found in the vicinity of the settlement	
Building materials, firewood and Homewares	<ul style="list-style-type: none"> Material for the home of local communities largely using material manufacturer (such as cement, brick, zinc, asbestos, plywood, light steel frame and others). Timber to build homes obtained by purchase from the loggers in the form of planks, or hire loggers to cut wood in the garden or shrub that has not been opened in the vicinity of the village. Household appliances used factory-made nearly everything made of glass, plastic and aluminum, though there is still some fishing equipment and a few other vessels made from traditional ingredients/ natural resource available locally (in the garden) such as rattan and bamboo. 	

Source:

- *The results of the interviews, field visits Aksenta, (2017)*
- *Sungai Melayu District and Matan Hilir Selatan District in Figure 2016; (BPS, Ketapang Regency 2016)*

Culture and religion

Majority population of Sungai Melayu is Dayak Pesaguan and in Kemuning Biutak Dayak Kendawangan. Other ethnics are the Javanese, Chinese, Bugis, Madurese, Minangkabau. These tribes are the entrants for reasons of employment or marriage (**Table 11:** Ethnic and religious composition in the villages around PT HPE, page 22). The practice of the customs by the public is limited and ceremonial in nature. In the practice of the customs and culture, it is very closely related to the cycle of human life (birth, coming of age, sickness, death, and marriage), as well as the agricultural cycle of rice fields (planting and harvesting). The ceremonies associated with the cycle of human life has been filled with religious values, in accordance with the religion adhered. The social institution of society and everyday life of its more regulated by State law.

The Catholic religion is embraced by the majority of the population in the villages in the region of study. There are also citizens who embraced Protestantism and Islam. A limited number of adherents still there are ancestral beliefs (animism), especially elderly people.

3.3.6 The presence of HCV Area

The results of this study concluded, that in the study area, there are three types of HCV, namely HCV 1, HCV 3, and HCV 4. A summary the presence of HCVs in the area of assessment are presented in Table 15.

Table 15: Summary Description and Presence of HCVs in Study Area

		Summary Description and Justification		
HCV	The definition of the	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	Populations of several species of endemic or RTE (<i>rare, threatened or endangered species</i>), consists of three plant species and one species of bird	-	
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.	-	-	The landscape is severely degraded and fragmented, not part of the IFL, and not an important corridor for species with extensive home ranges
3	Rare, threatened, or endangered ecosystems, habitats or refugia.	Several Dipterocarp tree species are found in the riparian buffer areas	-	
4	Basic ecosystem services in critical situations including protection of water catchments and control of erosion of vulnerable soils and slopes.	There are areas that function to maintain the river flow regime	-	-
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.	-	-	The community in the study area is not a traditional society that fulfills its needs by directly extracting from nature. The basic needs of carbohydrates and protein are mainly obtained through purchase, and some from cultivation. Adequate basic infrastructure is available to reach medical care, education and to support the economy
6	Sites, resources, habitats and landscapes of global or national	-	-	The ethnicity and culture of the communities is very

		Summary Description and Justification		
HCV	The definition of the	Present	Potential	Absent
	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.			heterogenic, and the practices of culture are more influenced by religions of the different ethnic groups There is no more practice of traditional ceremonies that are associated with custom sites, religious/sacred or sacred place

Description: ☑ = Present; - = Absent

HCV 1

Several conditions presented in Table 16 below can be used to indicate the presence of HCV 1 (Brown *et al.*, 2017). According to the assessment output, it is evident that HCV 1 requirements are met in study area.

Table 16: Summary of Conditions that Qualify as HCV 1

Qualify as HCV 1	Present/Absent
A high overall species richness, diversity or uniqueness	-
Populations of multiple endemic or RTE species.	✓
Important populations or a great abundance of individual endemic or RTE species <ul style="list-style-type: none"> • Year-round (e.g. key habitat for a specific species) or , • Seasonally, including migratory corridors, sites for breeding, roosting or hibernation, or refuges from disturbance 	-
Small populations of individual endemic or RTE species	-
Sites with significant RTE species richness, or populations	-
Particularly important genetic variants, subspecies or varieties.	-

Description: ✓ =Present; - = Absent

Justification

The results of the pre-assessment shows that the study area have low biodiversity level. This is because the study area is outside and far away from the area of biodiversity concentration of Borneo. In addition, the condition of the habitat has been heavily degraded and fragmented. However, from the results of the study field recorded 173 species of flora and fauna which consists of 127 species of plants, 38 bird species, three species of mammals, and 5 species of reptiles.

The study area is not a site that has the richness, diversity, or the uniqueness of species is high. The number of species of flora and fauna in the area of study of approximately 50% of the total species of flora and fauna recorded in the area of biogeography is similar, namely, Cagar Alam Muara Kendawangan (CAMK).

From 173 species of flora and fauna recorded in the study area, only one bird species found is endemic to Borneo, namely the Dusky Munia (*Lonchura fuscans*). Dusky Munia distribution covers the entire main island and its satellite. This species is not a species with distribution limited to a specific location, but it is common in the open land, residential and farming land including palm oil plantations. The Dusky Munia is not of national significance.

Endangered species in the study consisted of three plant species and 3 species of birds. The RTE species of plants are Balangeran (*Shorea balangeran*) with the status of Critically Endangered, then two species Vulnerable i.e. Arang-arang (*Syzygium densiflorum*) and Tumih (*Combretocarpus rotundatus*). The third species of plants are found only in the form of small plants/seeds and scattered in certain spots with low populations. An RTE species is the Lesser Adjutant (*Leptoptilos javanicus* -Vulnerable) which was encountered in a ponds in the riparian buffer area of Sungai Kepuluk. The Lesser Adjutant is a solitary species which commonly visits water bodies. In addition, two migratory bird species (*Tringa totanus* and *Anthus novaeselandiae*), and 10 protected wildlife species were found in the study area.

Although their populations are quite small, HCV 1 species are deemed present in the study area.

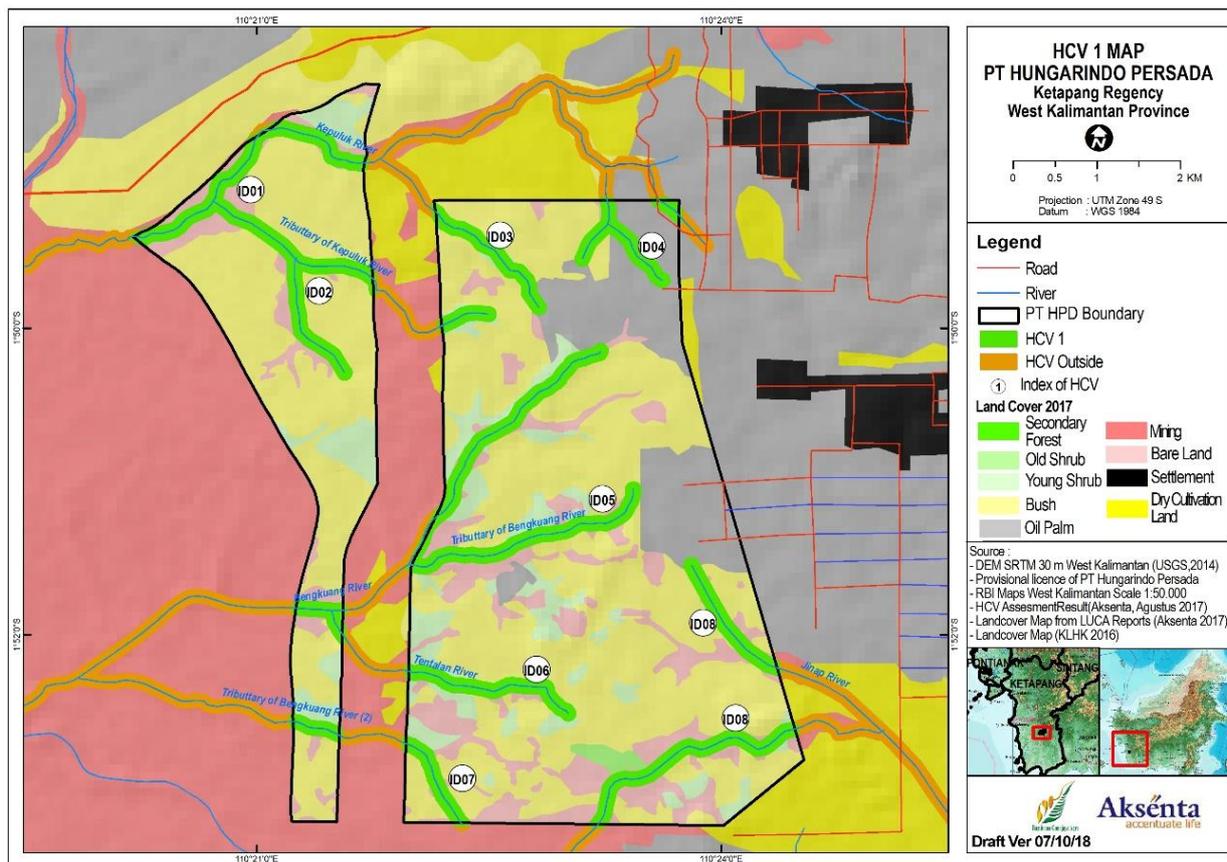
Location and Size of HCV 1

Based on the above description, the criterion for HCV 1 is fulfilled by the presence of small populations of RTE species, migratory bird species and protected wildlife species. An important area that needs to be backed up to the area of HCV 1 is the riparian buffer zone (Table 17). The total size of the HCVMA area is 290.35 ha, and the locations of HCV 1 areas are presented in Map 11.

Table 17: Locations and indicative HCV 1 areas in location permit of PT HPD

Index	Name of Location	HCV (ha)	HCVMA (ha)
ID01	Kepuluk River and its riparian buffers	37.57	37.57
ID02	Kepuluk Sub River and its riparian buffers	46.18	46.18
ID03	Kepuluk 2 Sub River and its riparian buffers	19.19	19.19
ID04	Kepuluk 3 Sub River and its riparian buffers	21.82	21.82
ID05	Bengkuang Sub River and its riparian buffers	71.03	71.03
ID06	Tentalan River and its riparian buffers	25.69	25.69
ID07	Bengkuang 2 Sub River and its riparian buffers	18.72	18.72
ID08	Jinap River and its riparian buffers	50.15	50.15
Total Area HCV		290.35	290.35
Total Location Permit *		3,748.21	3,748.21
% HCV Area against the Location Permit		7.75	7.75

Remarks: The above mentioned area sizes are based on GIS calculations, while the size of the PT HPD concession based on the legal location permit is 3,700 ha



Map 11: Map of Indicative HCV 1 areas in location permit of PT HPD

HCV 2

Conditions as presented in Table 18 can be used to detect the presence of HCV 2 (Brown *et al.*, 2017). This assessment, however, concludes that the requirements for an area to be considered as HCV 2 are not met.

Table 18: Summary of Conditions that Qualify as HCV 2

Qualify as HCV 2	Present/Absent
Large areas (e.g. could be greater than 50,000ha, but this is not a rule) that are relatively far from human settlement, roads or other access. Especially if they are among the largest such areas in a particular country or region	-
Smaller areas that provide key landscape functions such as connectivity and buffering (e.g. protected area buffer zone or a corridor linking protected areas or high quality habitat together). These smaller areas are only considered HCV 2 if they have a role in maintaining larger areas in the wider landscape.	-
Large areas that are more natural and intact than most other such areas and which provide habitats of top predators or species with large range requirements.	-

Description: ✓ =Present; - = Absent

Justification

This assessment concludes that the requirements for an area to be considered as HCV 2 are not met in the study area. Results of the study showed that the landscape currently consists of palm oil plantations bordering the forest production, that has been degraded from fires and illegal mining. As already conveyed in the context of the biodiversity landscape, the study area has been repeatedly caught fire. It is recorded great fire in 1997/1998, 2006 and 2015. Therefore, in general the landscape studied is not a natural landscape natural again, both within and around the study area, and buffering functions or corridor has been lost.

The following areas of study conditions that do not meet the criteria of HCV 2:

1. Study area is not directly bordering with all important conservation landscape as IBA and EBA, Ramsar Site, HoB and the IFL. Peatland ecosystem of Sungai Putri, or often referred to as the essential ecosystem region (KEE) Sungai Putri is about 20 km to the southwest of the study area and separated by area of palm oil plantations. Thus, the study area is not part of connected directly with the KEE.
2. The study area is not part of *Intact Forest Landscape* (IFL). The study area has no forest landscape intact and already degraded and fragmented. Invasive plant species, such as *Acacia mangium* and *Chromolaena odorata* has dominated composition of the vegetation in the study area. This situation occurs due to the activity of logging, illegal gold mining that been there a long time and the presence of opening land for oil palm. In addition, there has been repeatedly big fires in the area.
3. The study area is considered small (about 3,700 ha), but proved to be not providing key functions for the landscape. This happens because in addition to the ecosystem in the study area have degraded and fragmented, also there are no protected areas or habitats that are of high quality. Thus, the study area does not have a role in maintaining a larger area in the wider landscape.

HCV 3

There are 4 criteria of ecosystem that are considered to meet the requirements of HCV 3 presence. They are: naturally rare; anthropogenically rare, threatened or endangered, and classified as threatened under national or international systems (Brown *et al.*, 2017). Table 19 presents situations for detecting the presence of HCV 3 (Brown *et al.*, 2017). According to this assessment output, no areas in the study area qualify as HCV 3.

Table 19. Summary of conditions that Qualify as HCV 3

Qualify as HCV 3	Present/Absent
Naturally rare because they depend on highly localized soil types, locations, hydrology or other climatic or physical features, such as some types of limestone karst forests, inselbergs, montane forest, or riverine forests in arid zones.	-
Anthropogenically rare, because the extent of the ecosystem has been greatly reduced by human activities compared to their historic extent, such as natural seasonally flooded grasslands on rich soils, or fragments of primary forests in regions where almost all primary forests have been eliminated	-
Threatened or endangered (e.g. rapidly declining) due to current or proposed operations	-
Classified as threatened in national or international systems (such as the IUCN Red List of Ecosystems)	✓

Description: ✓ =Present; - = Absent

Justification

Based on secondary data and experience, the study area is situated in a landscape which highly likely consists of at least 3 unique ecosystem types, namely Lowland Dipterocarp Forest, Heath Forest, and Peat Swamp Forest. According to Land System Map (RePProt, 1989), the study area is located in the Segintung land system (SGT; 78%), in the Rangankau land system (RGK; 12%), and in the Serimbang land system (SRM; 10%). The Segintung land system consists of sandy terraces and potentially consist of the Heath Forest ecosystem. The Heath Forest ecosystem is nationally categorized as threatened ecosystem. The Rangankau land system consists of sedimentary plains, and the dominant ecosystem here is potentially Lowland Dipterocarp Forest. This ecosystem type is nationally classified as both Rare and Threatened. The Serimbang land system consists of alluvial valleys, and one of the possible ecosystems here would be Peat Swamp Forest, which is also is nationally categorized as threatened ecosystem.

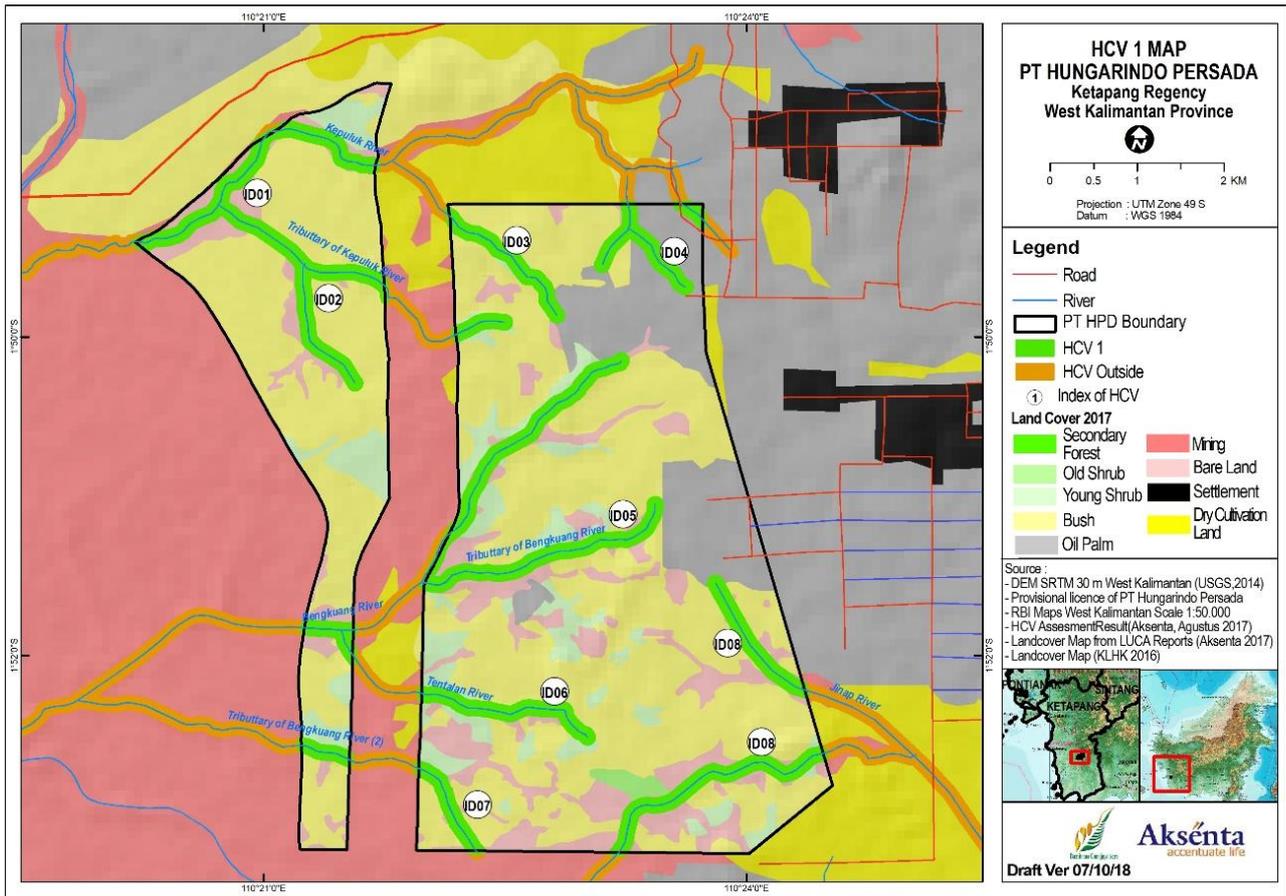
Looking at vegetation cover in the study area, all natural ecosystems in the assessment area have become severely degraded since the 1990's, and the LUCA for this license area (Aksenta, 2017) shows that no forest (neither primary forest, secondary forest nor young regenerating forest) has been present in the study area since at least 2005.

In this assessment, the Precautionary Approach was used, as described in the revised HCV Toolkit for Indonesia (Consortium to Revise the HCV Toolkit for Indonesia, 2008). Based on outcome of the Precautionary Approach method, HCVA 3 was deemed present, as several Dipterocarp species were fund in the riparian buffers of the rivers (Table 20, Map 12). This remaining dipterocarp vegetation will be able to restore itself through natural succession.

Table 20 . Locations and indicative HCV 3 areas in location permit of PT HPD

Index	Name of Location	HCV (ha)	HCVMA (ha)
ID01	Kepuluk River and its riparian buffers	37.57	37.57
ID02	Kepuluk Sub River and its riparian buffers	46.18	46.18
ID03	Kepuluk 2 Sub River and its riparian buffers	19.19	19.19
ID04	Kepuluk 3 Sub River and its riparian buffers	21.82	21.82
ID05	Bengkuang Sub River and its riparian buffers	71.03	71.03
ID06	Tentalan River and its riparian buffers	25.69	25.69
ID07	Bengkuang 2 Sub River and its riparian buffers	18.72	18.72
ID08	Jinap River and its riparian buffers	50.15	50.15
Total Area HCV		290.35	290.35
Total Location Permit *		3,748.21	3,748.21

Remarks: The above mentioned area sizes are based on GIS calculations, while the size of the PT HPD concession based on the legal location permit is 3,700 ha



Map 12: Map of Indicative HCV 3 areas in location permit of PT HPD

HCV 4

The results of this study found that there are conditions that meet the criteria of HCV 4 in the area of study as presented on the table 21.

Table 21: Summary of conditions that Qualify as HCV 4 (Brown *et al.*, 2017)

Qualify as HCV 4	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	-
Protection of vulnerable soils, aquifers and fisheries	-
Provision of clean water, for example where local communities depend on natural rivers and prings for drinking water, or where natural ecosystems play an important role in stabilizing steep slopes. These two values frequently occur together and the area which provides the critical services (water provision and erosion control) may overlap partially or completely.	-
Protection against winds, and the regulation of humidity, rainfall and other climatic elements.	-

Qualify as HCV 4	Present/Absent
Pollination services, for example exclusive pollination of subsistence crops provided by native bees for smallholders in the Kenyan highlands, or of commercial Durian crops by bats in SE Asia. In both cases, the pollinators are dependent on the presence of suitable forest habitat and do not survive in purely agricultural landscapes.	-

Description: ✓ =Present; -= Absent

Justification

Currently, the entire river in the area of study is already heavily degraded. This is mainly caused by illegal gold mining activity since 1997. Such activities are concentrated around the flow of rivers. The mining activity has changed the natural shape of rivers, including the existence of natural vegetation in riparian. The river has been growing wide and increasingly shallow. The flow boundaries are relatively unclear. Riparian also degraded and is generally in the form of open land or quarry ponds. In addition, the former minerals also formed new branches around the natural flow of rivers. River morphology change affects significantly to decreasing natural function and important value of rivers. Therefore, the entire river and riparian in the area of study is not a buffer zone with vegetation zone or flooded land.

The entire study area on the river no longer has a function as the controlling erosion and water quality-keeping. This is mainly due to the quality of the land cover that has been degraded, so functions as a filter erosion have been degraded. Currently, there is no longer natural river area with natural vegetation or land cover with forested riparian. Riparian dominated by former quarry ponds of material and heaps of sand. Only a small portion of the rivers area with shrubs, even then already fragmented.

In the study there is no area of natural firebreaks. The river Kepuluk, which is the main river in the region of the study, have a width of 10-15 m. the river has different discharge fluctuations between wet season and dry season. This is indicated from the profile of rainfall in the surrounding areas of study and a period of months dry (rainfall < 60 mm) in August and September. As for the other rivers are generally only have a wide range 2-5 m, so the votes are not significant enough to be able to restrict or prevent the expansion of the fire.

In the study area, there is no body of water that serves as a provider of water. None of them are utilized by local community. Community water source of Sungai Melayu village comes from springs in the protected forest of Bukit Blaban which is outside the study area. While the community of the village Kemuning Biutak use wells and the river Pesaguan which is also located outside the study area.

Although current riparian does not have a value of HCV, but the function of these areas need to be improved in order to support the sustainability of the important values of the flow of the river. Therefore, the riparian are part of the area of the management of HCV (HCVMA). In addition, the management of the riparian of the rivers is also associated with the company's obligation to preserve and protect the rivers, mainly related to the management of the environmental impact.

Location and Size of HCV 4

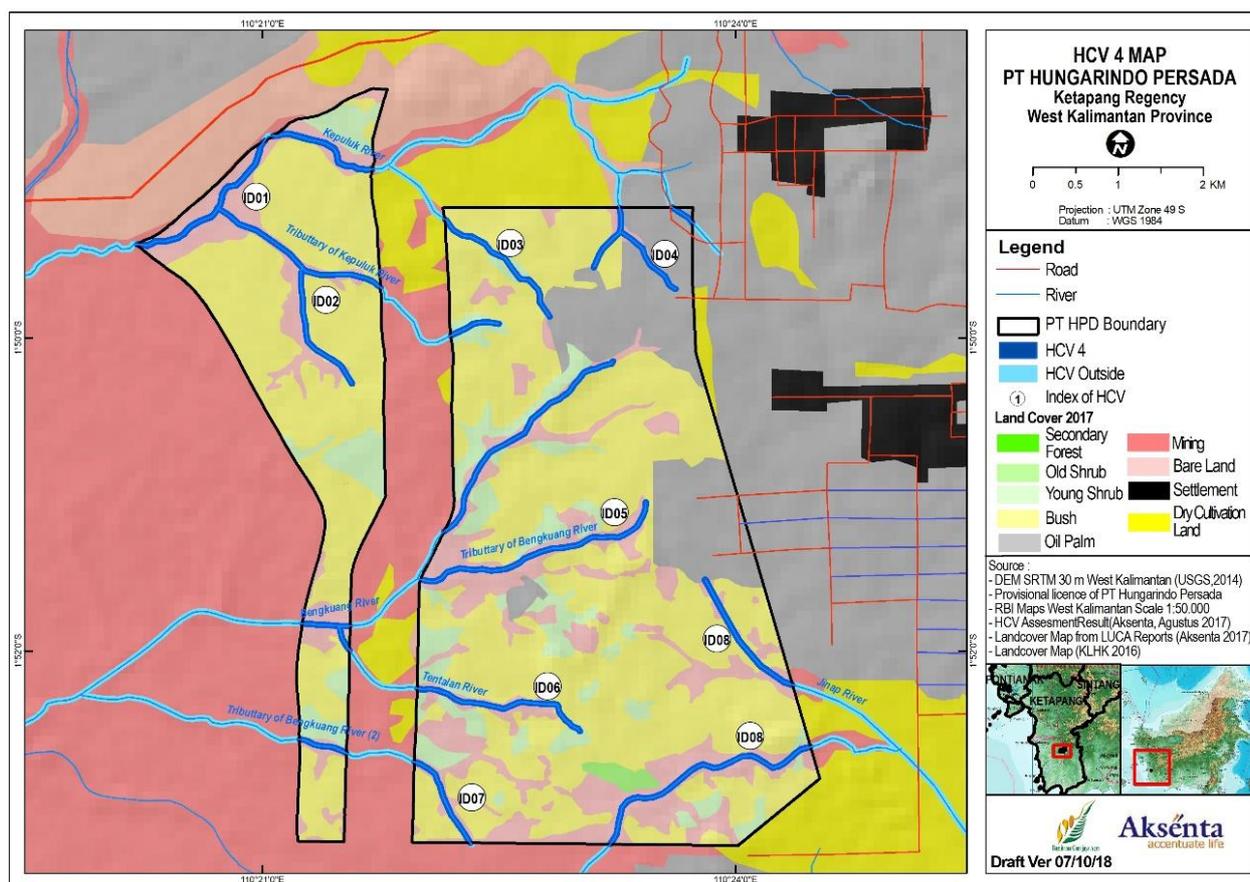
Total HCV 4 area identified is 13.5 ha in 8 segments of stream (Table 22). To support essential functions in these areas, the protection and preservation of the HCV area also includes the riparian as HCV management area (HCVMA). Area HCVMA in the area of the location permit of PT HPD includes 290.35 ha. The locations of HCV 4 areas and the HCVMA in the study area are presented in Map 13.

The total HCV area is calculated by buffering process for each river with a width of 50 m. The width is adequate to preserve and protect the important function of the river and riparian. In addition, the width areas of the river are also in accordance with the applicable laws and regulations.

Table 22: Location and HCV 4 area in the Location permit of PT HPD

Index	Name of Location	HCV (ha)	HCVMA (ha)
ID01	Kepuluk River	3.47	37.57
ID02	Kepuluk Sub River	1.74	46.18
ID03	Kepuluk 2 Sub River	0.72	19.19
ID04	Kepuluk 3 Sub River	0.41	21.82
ID05	Bengkuang Sub River	2.64	71.03
ID06	Tentalan River	0.97	25.69
ID07	Bengkuang 2 Sub River	0.72	18.72
ID08	Jinap River	2.87	50.15
Total HCV area		13.54	290.35
Total Location Permit *		3,748.21	3,748.21
% HCV Area against the Location Permit		0.36	7.75

Description: All of the area is based on the GIS calculation, while the location permit of PT HPD based on legal document is 3,700 ha



Map 13: HCV 4 areas in the license area of PT Hungarindo Persada

HCV 5

From the field observation and interview/discussion using FPIC principle with local community in the area, it is indicated that the study area has no significant social, economic and cultural situations, indicating no presence of HCV 5 (Table 23), as described in the Common Guidance for HCV Identification (Brown *et al.*, 2017).

Table 23: Summary of Conditions that Qualify as HCV 5 (Brown *et al.*, 2017)

Qualify as HCV 5	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	-

Description: ✓ =Present; - = Absent

Justification

Results of the study concluded that there is no situation that indicate the presence of HCV 5. Facilities and basic infrastructure are already available, so that the public can easily access facilities for education and health facilities. The supply of electricity and fuel are also available and easily obtained, as well as enough water is available, either for consumption or sanitation. Similarly, food supplies are easily available in the market as well as from own cultivation (see Table 14).

The community use of natural resources in the study area is not currently a major activity in the fulfillment of basic necessities. Therefore, the area has no value as HCV 5 as discussed below:

i. Hunting and trapping grounds (for game, skin and furs)

Almost all secondary forest had been converted into open land. In addition because of illegal logging and mining, such changes are also triggered by forest fires (in 1998 and last year 2016), destroyed most of the forests in this region. The destruction of forests and land cover changes drastically and hunting activities have led to the furs be reduced or disappear. The existence of hunting in the study area are very rare, because the land cover had been transformed into a bushes and shrubs, as well as former mining area. Hunting with the aim to meet animal protein needs and as a livelihood, was conducted concurrently with the illegal logging practice in the period up to 1990. Currently, the demand for meat (animal protein) is met from purchases and farming.

ii. NTFPs such as nuts, berries, mushrooms medicinal plants, rattan.

The traditional use of natural resources with direct consumption had been long abandoned by local community in the two villages. There is no longer community members that meets the needs of foods (carbohydrate and proteins) by extracting directly from forest/other natural ecosystems (non-farming). There was no mention of food obtained from the forest as big part of the diet, either all year or just on a critical season. All basic necessities obtained by buying from traders, market or cultivation.

Similarly, the need for medication is no longer extracted directly from nature, but rather rely on pharmaceutical drugs or medical treatment to health facilities/hospitals which can be reached easily.

iii. Fuel for household cooking, lighting and heating

The supply of electricity and fuel oil also available and easily obtained, either for production or transportation needs. For cooking, most of the people are already using subsidized LPG gas and kerosene. However, there are still communities that are still using firewood as an option from LPG and kerosene. However the use of firewood for cooking is not efficient and requires a long time. Firewood obtained from area located in the vicinity of their settlement. There are fuel retailers in all kampongs in the study area. Based on the explanation above, it can be concluded that in the study area there is no

place that has values essential to the fulfillment of fuel needs for household activities, such as cooking, lighting, and heating for the community in the two villages.

iv. **Fish (as essential sources of proteins) and other freshwater species relied on by local communities)**

The mining activity has polluted rivers and changed the natural flow of rivers, including the existence of riparian natural vegetation. The flow of rivers has been growing wide and increasingly shallow. Rivers morphology change affects significantly to decreased function of the natural and essential values of the rivers. There is no place in the rivers of the study area that is still use to find fish, or use as a source of water for the fisheries sector. The river that is still used by the community for fishing located the outside of the study area.

v. **Building materials (poles, thatching, timber)**

Wood building materials mostly acquired by purchase and partly retrieved from their land (agro forest) around the village. Land cover within the area of location permit (Izin Lokasi) is largely heath with a diameter of less than 20 cm. Wood with large diameter size are still in the secondary forest in the hills far from the village with difficult access. Likewise, household appliances used by the local community, almost all of them factory-made, made of plastic, glass and aluminum, which are obtained from the purchase. Even so there is still some tools (such as fishing tools, and other tools as containers) made from traditional materials, such as rattan and bamboo. Bamboo and rattan for making household tools, sourced from nearby area.

vi. **Fodder for livestock and seasonal grazing**

There is still practice for keeping cattle intended for investment and saving. Livestock grazing conducted in their private land nearby village. Cattles are cows and pigs with a limited population (less than 10). In the study area there is no nomadic shepherd who uses the forest or communally managed land as grazing fields. Therefore it can be concluded that in the study area there is no place that has an important value to meet the needs of the seasonal grazing and fodder for local community in the village of Kemuning Biutak and Sungai Melayu.

vii. **Water sources necessary for drinking water and sanitation**

The entire river in the study area has been heavily degraded (see discussion of HCV 4). This mining activity occurs almost in all rivers in the study area, so that almost all rivers in the study area have been damaged and polluted, so that local community in the study area is no longer using the river water that comes from the study area, for the purposes of sanitation and consumption since the rise of the mining activity. The current source of water comes from a spring located on the Bukit Blaban protected forest outside the area of location permit (Izin Lokasi). In the study area there is no body of water for

consumption or sanitation. The rivers in the study area are not used by community in both villages.

- viii. [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](#)

Palm oil plantations presence also have encouraged the increasing cultivation of palm oil by the community, as well as increasing number of settlers around the study area. These conditions impacted the local community livelihoods becoming more diverse. One household can have access to different sources of livelihood to meet one needs. For example, in addition to work for a company, in holiday one can work in their family lands and have income from plasma. Local community in the two villages have already modern living with multiple sources of livelihoods. In the field study, there was no mentioned of the local community that meets basic necessities with extracting directly from forest/other natural ecosystems (non-farming). To satisfy the basic necessities (good, carbohydrate, protein, and medication) is obtained by purchasing (in the market or travelling sellers), as well as aquaculture. There is no mention of food obtained from the first as part of the diet, either all year or just on critical seasons.

There is no activity that aim to meet basic needs directly extracted from natural resources that are not replaceable in the study area. Illegal gold mining in the study area cannot be categorized as an area that has a value as HCV 5, because the practice has been damaging to the environment, so it can interfere with the existence of other HCV. Therefore all the utilization of natural resources in the study area has no value as HCV 5.

HCV 6

Common Guidance for HCV Identification (2017) describes situations of social and cultural communities qualify as HCV 6. The survey results and interviews/discussions with FPIC principle in the two villages of the study area, shows that there is no situation that becomes a marker of the HCV 6 presence (Table 24).

Table 24: Summary of Conditions that Qualify as HCV 6 (Brown *et al.*, 2017)

Qualify as HCV 6	Present/Absent
Sites recognized 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 recognized and important historical or cultural values, even if they remain unprotected by legislation.	-
Religious 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.	-

Description: ✓ =Present; - = Absent

Results of the study and interviews with local residents in the study area showed that the social and cultural situation has developed the villages into transition to modern villages, so the condition indicating HCV 6 presence was not found in the field. Therefore, the area has no value as HCV 6 as discussed below:

i. [Sites recognized as having high cultural value within national policy and legislation](#)

In the study area, there is no site/location or distribution of site recognized by national policy or legislation that has high cultural values. The nearest cultural site recognized by national policy or legislation that has high cultural values is a Royal Palace of Matan Tanjungpura, Sampit village, Delta Pawan district, Ketapang regency, which is about 40 Km.

ii. [Sites with official designation by national government and/or an international agency like UNESCO](#)

In the study area, there is no site/location or distribution of the site that has official government designation of national and/or international institutions (UNESCO). The nearest site, listed on *The Tentative List of UNESCO World Heritage Sites*, is Betung Kerihun National Park (*Transborder Rainforest Heritage of Borneo*), about 400 km from the area of study, in the districts of Embaloh Hulu, Embaloh Hilir, and Putussibau, Kapuas Hulu regency, Kalimantan Barat Province.

iii. [Sites with recognized and important historical or cultural values, even if they remain unprotected by legislation](#)

The local communities in the study area are no longer traditional indigenous communities that still strongly practice traditional ceremonies. This is also confirmed in the public consultation, during which all participants stated that there are no areas that have historical or cultural values, or sites with religious/sacred values within the study area.

iv. [Religious or sacred sites, burial grounds or sites at which traditional ceremonies take place that have importance to local or indigenous people](#)

In the study area there is no site/location of the religious or sacred, burial or land holding of the ceremony have an important role for local communities or indigenous. Local cemetery is located in the two villages' territory next to the settlement.

The ethnicity in the study area is quite heterogeneous, due to the presence of the logging companies in the past and palm oil plantation companies. This has encouraged the influx of people from other ethnics to this area. This heterogeneity has encouraged cultural acculturation. Heterogeneity has also been encouraging the community to act economically and rationally. The communities currently residing in two villages are no longer a traditional society that are still practicing strong customs. The customs are more ceremonial in nature and culture, as well as more influenced by each ethnic religion and not conducted in special sacred site.

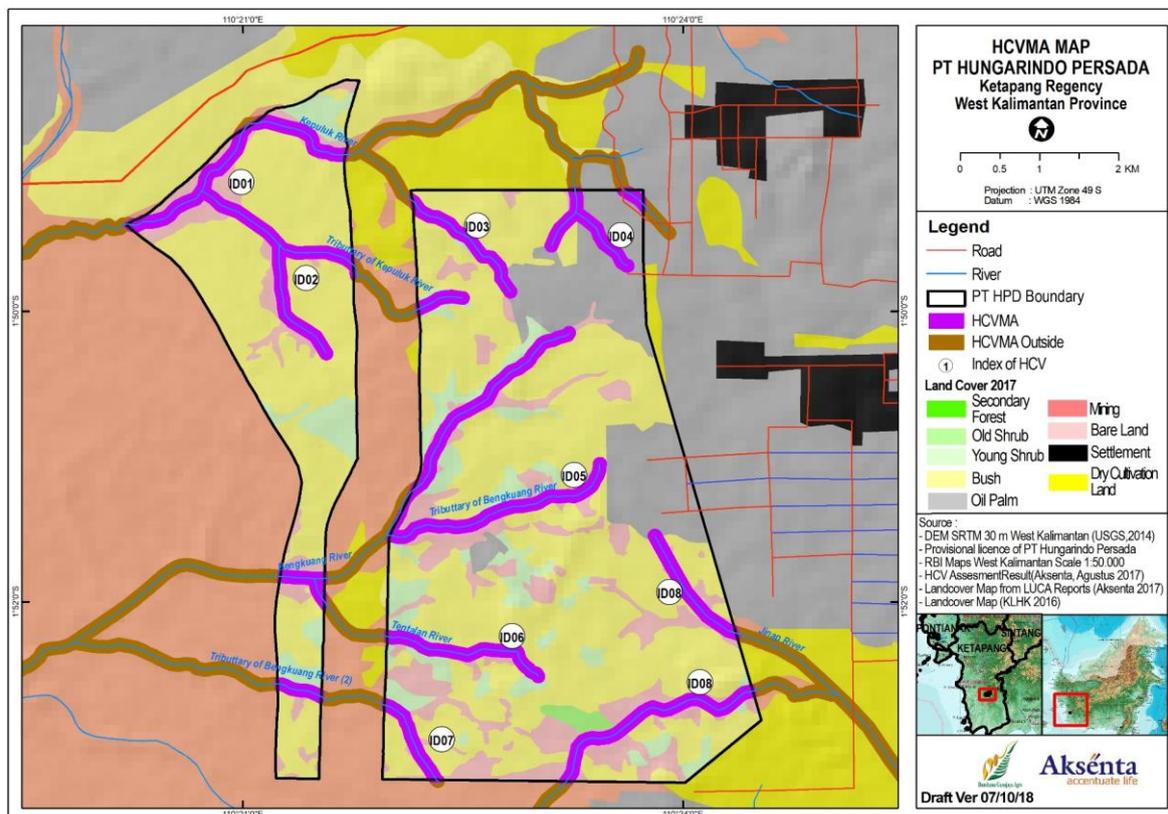
v. [Plant or animal resources with totemic values or used in traditional ceremonies](#)

As already explained above, the practice of traditional ceremony in the study area is more ceremonial in nature and culture, as well as more influenced by influenced by each ethnic religion. There is no site/location of plants or animals that have a value for the ceremony used by the community in fulfilling the religion and their cultural needs. Local

native in the Sungai Melayu village is the Dayak Pesaguan, in Kemuning Biutak is Dayak Kendawangan that has been mixed with others (Table 11: Ethnic and religious composition in the villages around PT HPE, page 22). Local native tribes of Dayak have embraced religion since 1960s. Likewise with migrants who have embraced various religions. This condition causes the practice of customs and culture much more influenced by the religious beliefs of each population, so that sites that have custom values, religious/sacred land, sacred burial site, or conducting other rituals are not present.

Table 25: HCV Area of PT HPE

Index	Location name	HCV Types	HCV** (ha)*	HCVMA (ha)*
ID01	Kepuluk river and riparian (50 m)	1,3, and 4	37.57	37.57
ID02	Sub river Kepuluk and riparian (50 m)	1,3, and 4	46.18	46.18
ID03	Sub river Kepuluk 2 and riparian (50 m)	1,3, and 4	19.19	19.19
ID04	Sub river Kepuluk 3 and riparian (50 m)	1,3, and 4	21.82	21.82
ID05	Sub river Bengkuang and riparian (50 m)	1,3, and 4	71.03	71.03
ID06	River Tentalan and riparian (50 m)	1,3, and 4	25.69	25.69
ID07	Sub river Bengkuang 2 and riparian (50 m)	1,3, and 4	18.72	18.72
ID08	River Jinap and riparian (50 m)	1,3, and 4	50.15	50.15
Total HCV**			290.35	290.35
Total Location Permit *			3,748.21	3,748.21
% HCV to Location Permit			7.75	7.75



Map 14: HCV and HCVMA in the area of PT HPE

3.4 Carbon Stock Assessment (CSA)

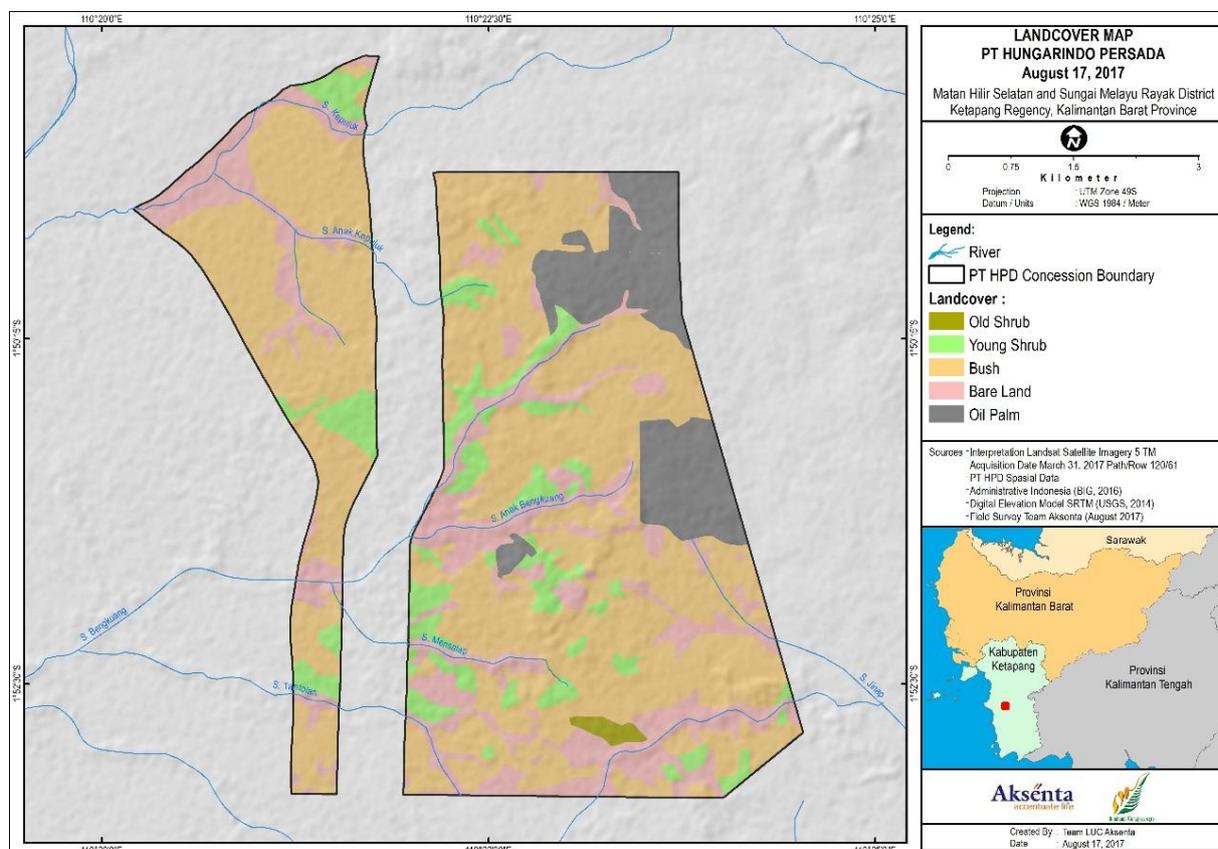
Initial studies focused on the land cover analysis, using the Landsat 8 OLI satellite imagery with the acquisition date of 31 March 2017, to determine the stratification of the vegetation cover. Land cover classification, as the basis for determining the number and the placement of sample plots - at the preparation stage - as well as the extrapolated value of carbon stocks - at the analysis stage -, refers to the classification of land cover ISO 7645 (National Standardization Agency, 2010), carried out through the interpretation of satellite imagery band 654 and band 653 is not guided by the classification method (unsupervised classification).

Table 26: Results of the interpretation of satellite data prior ground truthing

Land cover	Area**	
	(ha)	(%)
Belukar (OS)	18.1	0.5
Semak Belukar (YS)	356.5	9.5
Semak (BS)	2,209.6	58.9
Oil Palm (OP)	383.0	10.2
Open Land (OL)	781.0	20.8
Total	3,748.2	100

*) Source: the interpretation of Landsat 8 satellite image data OLI TIRS In January 2014 which has been verified in the field in 31 March 2017

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



Map 15: Landcover Map of PT HPE

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 45 plots, divided into 8 plots of strata Os, 6 plots of strata Op, 9 plots of strata Ys and 22 plots of strata Bs. 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 27: Average Biomass Above Ground Level (AGB) at PT HPE

Variable	Above Ground Biomass (Ton/Ha)					Uncertainty (CI-95%)(%)	Coefficient of Variation
	Mean	Minimum	Maximum	SE Mean	St Dev		
Os	188.3	170.1	208.3	7.0	15.7	7.5	8.3
Ys	135.9	111.7	163.8	7.7	20.5	11.4	15.1
Bs	45.6	19.3	75.3	4.7	18.1	20.4	39.6
OP	62.3	60.3	67.1	1.1	2.6	3.4	4.2

Source: Analysis result Aksenta Team, August 2017

Noted: Os= Old Shrub; Ys= Young Shurb; Bs= Bush and open land; Op= Oil Palm

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 28: Average Biomass Below Ground Level (BGB) at PT HPE

Variable	Above Ground Biomass (Ton/Ha)					Uncertainty (CI-95%)(%)	Coefficient of Variation
	Mean	Minimum	Maximum	SE Mean	St Dev		
Os	35.5	32.5	38.8	1.2	2.6	6.6	7.4
Ys	26.6	22.4	31.4	1.3	3.5	10.1	13.3
Bs	10.1	4.7	15.8	0.9	3.6	18.3	35.5
OP	13.4	13.0	14.3	0.2	0.5	3.0	3.7

Source: Analysis result Aksenta Team, August 2017

Noted: Os= Old Shrub; Ys= Young Shurb; Bs= Bush and open land; Op= Oil Palm

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 29: Average of Woody Debris Necromassa at PT HPE

Variable	Above Ground Biomass (Ton/Ha)					Uncertainty (CI-95%)(%)	Coefficient of Variation
	Mean	Minimum	Maximum	SE Mean	St Dev		
Os	5.3	2.4	8.8	1.9	3.3	71.1	61.5
Ys	3.1	1.2	5.8	0.8	2.0	49.1	64.9
Bs	2.5	0.2	4.5	0.3	1.2	26.8	48.3
OP	4.3	3.6	5.0	0.3	0.6	13.3	13.3

Source: Analysis result Aksenta Team, August 2017

Noted: Os= Old Shrub; Ys= Young Shurb; Bs= Bush and open land; Op= Oil Palm

Table 30: Average of Litters Necromassa at PT HPE

Variable	Above Ground Biomass (Ton/Ha)					Uncertainty (CI-95%)(%)	Coefficient of Variation
	Mean	Minimum	Maximum	SE Mean	St Dev		
Os	8.5	7.7	10.0	0.5	4.1	11.7	11.7
Ys	2.8	1.7	4.5	0.5	2.9	32.0	42.4
Bs	1.9	0.5	3.5	0.2	1.1	18.6	49.2
OP	2.4	1.9	3.3	0.2	0.7	17.7	21.6

Source: Analysis result Aksenta Team, August 2017

Noted: Os= Old Shrub; Ys= Young Shurb; Bs= Bush and open land; Op= Oil Palm

The total amount of biomass carbon reserves in the study area was estimated by performing regression analysis against the value of carbon stocks in each plot with the value of shortwave infrared spectral data from Landsat 8 satellite image (band 6). This approach requires a longer process, but will provide a higher level of accuracy than the comprehensive approach based on each stratum or ecosystem types. Extrapolation performed on the estimation of the value of carbon derived from biomass and necromass. Extrapolating results are then used to map carbon stocks in the study area derived from biomass and necromass.

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 TTL. In order to facilitate the discussion and mapping of the carbon stocks from the biomass, so that in this study the amount of carbon stocks are grouped into three classes (HCS +, 2015), namely:

- BC1 : Reserve carbon biomass 0-20 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 80-97.9 ton-C/ha

Table 31: Above Ground Biomass carbon stocks based on land cover classes at PT HPE

Strata	Carbon of AGB (kilo Ton-C)					Total	Area** (ha)	Rata-rata (Ton-C/ha)
	BC1	BC2	BC3	BC4	BC5			
Os				0.7	0.8	1.4	17.8	79.9
Ys	0.7	8.3	1.6			10.6	356.2	29.8
Bs	12.5	37.7				50.2	2990.3	16.8
Op		11.8				11.8	383.9	30.8
Total (Kilo Ton-C)	13.2	57.8	1.6	0.7	0.8	74.1	3,748.2	19.8
Luas (ha)	1699.1	1993.7	37.6	9.1	8.7	3,748.2		
Rata-rata (Ton-C/ha)	7.8	29.0	43.4	71.6	88.4	19.8		

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

Noted: Os= Old Shrub; Ys= Young Shurb; Bs= Bush and open land; Op= Oil Palm

Table 32: The area according to the classification of AGB carbon stocks for each strata of land cover at PT HPE

Strata	Total Carbon Stock per classification (Ha)					Total Area** (ha)
	BC1	BC2	BC3	BC4	BC5	
Os				9.1	8.7	17.8
Ys	35.4	283.1	37.6			356.2
Bs	1663.7	1326.6				2990.3
Op		383.9				383.9
Total	1699.1	1993.7	37.6	9.1	8.7	3,748.2
Total (%)	45.3%	53.2%	1.0%	0.2%	0.2%	100.0%

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

Noted: Os= Old Shrub; Ys= Young Shurb; Bs= Bush and open land; Op= Oil Palm

Table 33: Total Carbon Stock Recapitulation at PT HPE (2017)

Sumber Karbon	Cadangan karbon total (kilo ton- C)*					Total (Kilo Ton-C)	Rata-rata (Ton-C/ha)
	BC1	BC2	BC3	BC4	BC5		
Above Ground Biomass	13.2	57.8	1.6	0.7	0.8	74.1	19.8
Below Ground Biomass	3.1	12.4	0.3	0.1	0.1	16.1	4.3
Nekromas kayu mati	n/d						
Nekromas serasah	n/d						
<i>Soil Carbon</i>							
Placaquods, Tropopsaments	114.2	155.8	3.5	0.9	0.8	275.2	73.4
Tropaquents	30.6	21.3	0.1			52.0	13.9
Tropudults, Paleudults, Tropaquepts	24.3	16.9				41.2	11.0
Total (Kilo Ton-C)	185.4	264.2	5.5	1.6	1.7	458.5	122.3
Luas (Ha)	1699.1	1993.7	37.6	9.1	8.7	3748.2	

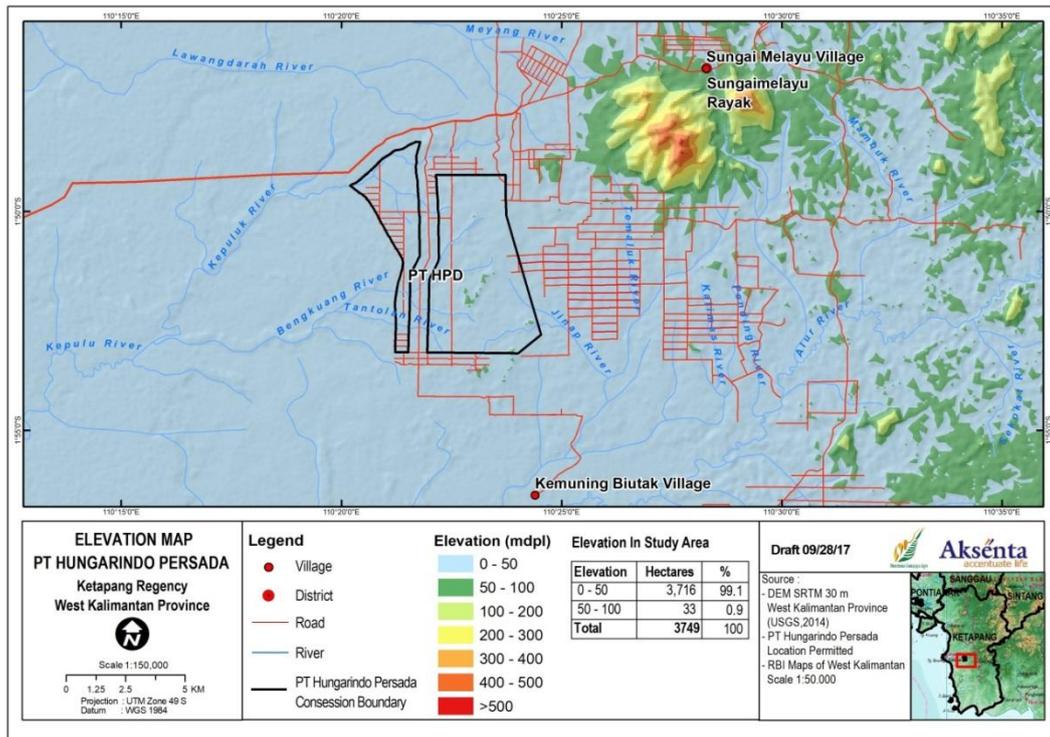
Conclusion:

- Most of the biomass carbon stock comes from shrubs, which is 62% of carbon stocks sourced from biomass.
- The total carbon stock in the operational area of PT HPE is 1659.7 kilo tons-C with an average of 442.8 tons-C/ha consisting of 89.6% sourced from soil C-organic, 10.4% from biomass

- There are no areas with carbon stocks sourced from relatively high biomass (> 75 tons-C / ha)

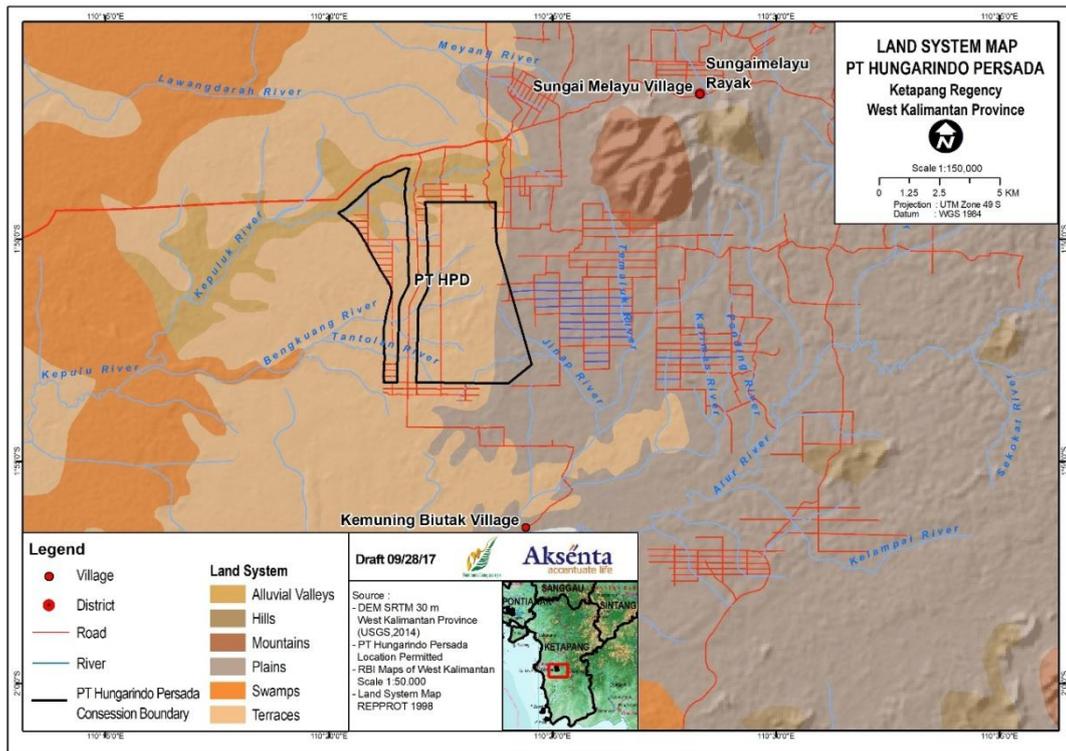
3.5 Soil & Topography

The topography profile in the area of PT HPE is relatively the same. Almost entire (99%) of these area is located at an altitude <50 m asl. Those are flat areas that have a slope by 0-8%. Therefore, naturally, the potential for soil erosion in this region is low. The steep slopes are located in the northeastern of the HPE area, which is in Gunung Belaban Protection Forest Area.



Map 16: Elevation Map of PT HPE

Based on map of land system (RePPPProt, 1989), the area of PT HPE consists of 3 (three) land systems, i.e.: Segintung (78%), Rangankau (12%), and Serimbang (10%). The areas with Segintung Land System are an area of sandy terraces and flooded temporarily. While the areas with Rangankau land system has a plain form of physiography; and the Serimbang land system is an alluvial valleys area.



Map 17: Land System in the area of PT HPE

The soil type in the study area consists of three land associations (RePPProT, 1989):

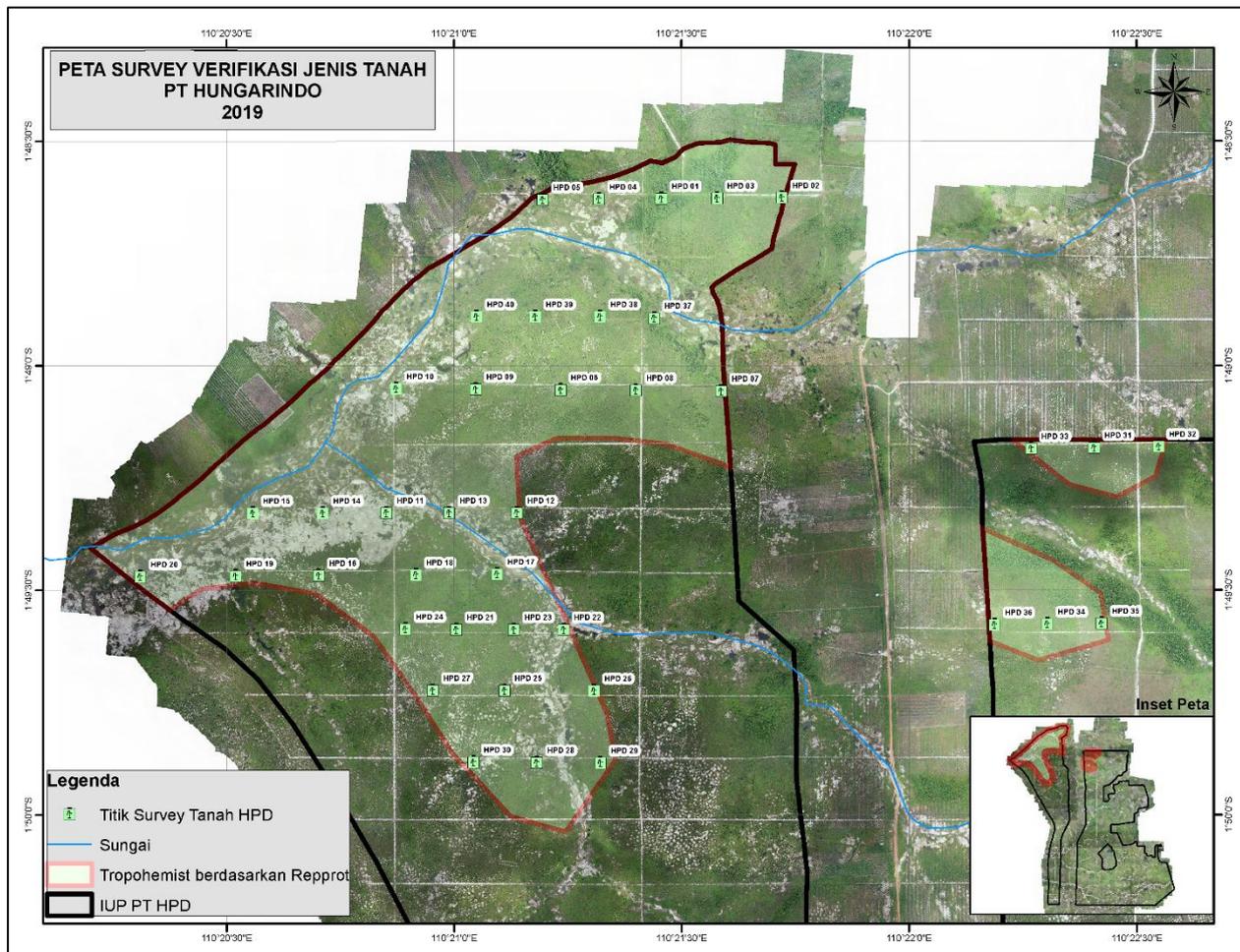
- i. Placaquods and Tropopsamments; sandy soils that dominate the area (78%), has a low fertility with a pH of 3-5, as well as having low water retention capability
- ii. Tropohemists and Tropaquents; covers 10% of the study area located in the north around the Kepuluk River
- iii. Tropodults, Paleodults, and Tropaquepts; is located in the south-west of the study area with an area coverage of 12% of the total area of PT HPE.

On the Map 10 and Map 17, by using the 1989 RePPProT (Regional Physical Planning Program for Transmigration) data system, it was identified that there was a Tropohemist soil type in the PT HPE area. The land system map is a large scale map so that there is a possibility of errors in digitizing the map. As a clarification, PT HPE has conducted a field survey for the suitability of soil types in the area suspected of being a Tropohemist.

The survey is conducted by first determining the verification sampling point which is done by purposive sampling method where sampling is determined by specifying the specific characteristics that are suitable with the objectives of the study so that it is expected to answer the research problems. A total of 40 points were verified which can be seen in Table 34 and the distribution map of the sampling point can be seen in Map 18. Where each of sampling point is dug a depth of 0 - 20, 20 - 40, 40 - 60, 60 - 80, and 80 - 100 cm.

Table 34: Verification Sampling Point for Soil Types at PT HPE

No	Point	X	Y
1	HPD 01	428552,37555	9799875,00833
2	HPD 06	428141,72345	9799090,91656
3	HPD 11	427431,21435	9798585,63207
4	HPD 16	427156,12768	9798329,27984
5	HPD 25	427913,08104	9797857,12648
6	HPD 28	428044,94125	9797561,80699
7	HPD 21	427717,25735	9798108,19354
8	HPD 31	430315,57189	9798854,91236
9	HPD 34	430124,85492	9798130,22124
10	HPD 02	429043,24569	9799878,98435
11	HPD 03	428778,54718	9799876,84031
12	HPD 04	428298,16298	9799872,94923
13	HPD 05	428069,10452	9799871,09387
14	HPD 07	428796,40129	9799086,53468
15	HPD 08	428448,77733	9799088,86139
16	HPD 09	427796,87190	9799093,22471
17	HPD 10	427472,23237	9799095,39758
18	HPD 12	427964,42762	9798586,74511
19	HPD 13	427688,42642	9798586,16898
20	HPD 14	427173,64237	9798585,09441
21	HPD 15	426887,65443	9798584,49743
22	HPD 17	427883,12476	9798334,09527
23	HPD 18	427551,60955	9798331,89940
24	HPD 19	426818,44934	9798327,04315
25	HPD 20	426429,13060	9798324,46441
26	HPD 22	428153,68309	9798107,29118
27	HPD 23	427952,27269	9798107,75484
28	HPD 24	427509,90222	9798108,64652
29	HPD 26	428277,73062	9797855,74904
30	HPD 27	427621,35315	9797858,22846
31	HPD 29	428303,34098	9797560,53846
32	HPD 30	427786,43123	9797563,07607
33	HPD 32	430578,21232	9798859,46125
34	HPD 33	430058,42589	9798850,45864
35	HPD 35	430346,16078	9798133,47590
36	HPD 36	429909,44907	9798127,05334
37	HPD 37	428522,58727	9799385,10660
38	HPD 38	428301,81849	9799390,29245
39	HPD 39	428038,92797	9799390,71578
40	HPD 40	427799,74416	9799390,29245



Map 18: Verification Sampling Point for Soil Types at PT HPE

Some sampling documentation is shown as follows:

(1) Point HPD 05



Depth: 0-20 cm



Depth: 20-40 cm



Depth: 40-60 cm



Depth: 60-80 cm



Depth: 80-100 cm

(2) Point HPD 20



Depth: 0-20 cm



Depth: 20-40 cm



Depth: 40-60 cm



Depth: 60-80 cm



Depth: 80-100 cm

(3) Point HPD 39



Depth: 0-20 cm



Depth: 20-40 cm



Depth: 40-60 cm



Depth: 60-80 cm

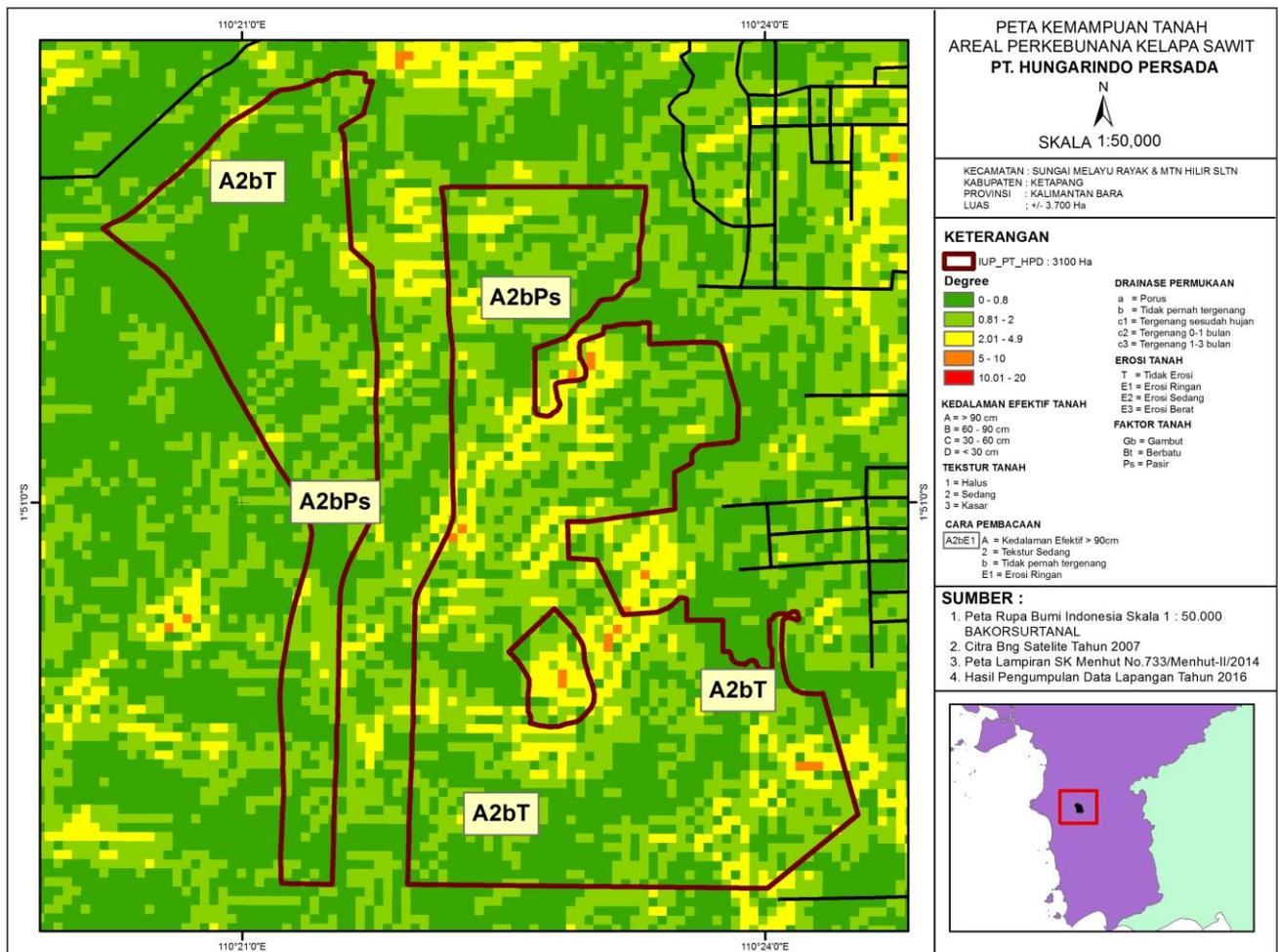


Depth: 80-100 cm

The results of a soil survey in 40 observation sampling points found that all sampling points were sand soil types which were **Haplohumods**, not **Tropohemist soil types**. So that at PT Hungarindo Persada there is no peatland area.

Table 35: Verification Sampling Point and Result Of Soil Types Verification on PT HPE

POINT	POINT X	POINT Y	Soil Type	
HPD 01	428552,38	9799875,01	Haplohumods	Moderate
HPD 02	429043,25	9799878,98	Haplohumods	Moderate
HPD 03	428778,55	9799876,84	Haplohumods	Moderate
HPD 04	428298,16	9799872,95	Haplohumods	Moderate
HPD 05	428069,10	9799871,09	Haplohumods	Moderate
HPD 06	428141,72	9799090,92	Haplohumods	Moderate
HPD 07	428796,40	9799086,53	Haplohumods	Moderate
HPD 08	428448,78	9799088,86	Haplohumods	Moderate
HPD 09	427796,87	9799093,22	Haplohumods	Moderate
HPD 10	427472,23	9799095,40	Haplohumods	Moderate
HPD 11	427431,21	9798585,63	Haplohumods	Moderate
HPD 12	427964,43	9798586,75	Haplohumods	Moderate
HPD 13	427688,43	9798586,17	Haplohumods	Deep
HPD 14	427173,64	9798585,09	Haplohumods	Moderate
HPD 15	426887,65	9798584,50	Haplohumods	Moderate
HPD 16	427156,13	9798329,28	Haplohumods	Moderate
HPD 17	427883,12	9798334,10	Haplohumods	Deep
HPD 18	427551,61	9798331,90	Haplohumods	Moderate
HPD 19	426818,45	9798327,04	Haplohumods	Moderate
HPD 20	426429,13	9798324,46	Haplohumods	Moderate
HPD 21	427717,26	9798108,19	Haplohumods	Moderate
HPD 22	428153,68	9798107,29	Haplohumods	Moderate
HPD 23	427952,27	9798107,75	Haplohumods	Moderate
HPD 24	427509,90	9798108,65	Haplohumods	Moderate
HPD 25	427913,08	9797857,13	Haplohumods	Moderate
HPD 26	428277,73	9797855,75	Haplohumods	Moderate
HPD 27	427621,35	9797858,23	Haplohumods	Moderate
HPD 28	428044,94	9797561,81	Haplohumods	Deep
HPD 29	428303,34	9797560,54	Haplohumods	Moderate
HPD 30	427786,43	9797563,08	Haplohumods	Moderate
HPD 31	430315,57	9798854,91	Haplohumods	Moderate
HPD 32	430578,21	9798859,46	Haplohumods	Moderate
HPD 33	430058,43	9798850,46	Haplohumods	Moderate
HPD 34	430124,85	9798130,22	Haplohumods	Moderate
HPD 35	430346,16	9798133,48	Haplohumods	Moderate
HPD 36	429909,45	9798127,05	Haplohumods	Moderate
HPD 37	428522,59	9799385,11	Haplohumods	Moderate
HPD 38	428301,82	9799390,29	Haplohumods	Moderate
HPD 39	428038,93	9799390,72	Haplohumods	Deep
HPD 40	427799,74	9799390,29	Haplohumods	Moderate



Map 19: Soil Map in the area of PT HPE, based on BPN survey

PT HPE has a Standard Operating Procedure (SOP) for the Management for Soil and Water. Based on the SOP, management for planting on mineral soil are follows:

- Cover crops planting
- Applications of empty bunches
- Midrib forms
- Ditch conservation/ rorak

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.

Data used: spatial data map of permit boundaries, conservation area, land cover map, soil types map and distribution of carbon stock map.

Alternatives of land development:

- Preparation of the alternatives of land clearing based on cut and overlay maps by block characteristic
- 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 36: Description of Development Scenarios

Scenario 1	<ul style="list-style-type: none"> No land clearance on conservation areas in community land; Only 50% of shrub will be planted No plan both for mill and methane capture facilities; Total planting plan = 1,546.58 ha.
Scenario 2	<ul style="list-style-type: none"> No land clearance on 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 = 2,409.39 ha.
Scenario 3	<ul style="list-style-type: none"> No land clearance on conservation areas in community land; Land clearance of all mineral land in any land cover; Plan for mill and methane capture facilities; Total planting plan = 2,409.39 ha.

Table 37: Resume of Development Scenarios

Description	Area (ha)	Land Clearance Alternative		
		1	2	3
A Land Use	441.14	441.14	441.14	441.14
Community's land (oil palm)	395.39			
Road Infrastructure	45.75			
B Conservation	267.6	267.6	267.6	267.6
C Potential Development Area	2,409.39			
Bare land (<i>lahan terbuka</i>)	524.89	524.89	524.89	524.89
Bushes (<i>semak</i>)	158.88	158.88	158.88	158.88
Shrubs (<i>semak belukar</i>)	1725.62	862.81	1,725.62	1,725.62
Total Development Area		1,546.58	2,409.39	2,409.39
Plan for methane capture		N	N	Y
TOTAL Area (A+B+C)		3,118.13	3,118.13	3,118.13

Table 38: Summary of GHG calculations based on land development alternatives

Alt.	Land Clearing	Corp. Squest	Fertiliser	N2O	Fuel	Peat	Conservation
Alt 1	7,783.57	-13,789.21	1,037.70	1,472.93	528.49	0.00	-45.25
Alt 2	12,912.45	-21,481.97	1,616.62	2,294.66	823.32	0.00	-45.25
Alt 3	14,473.91	-24,717.03	1,860.08	2,640.22	947.31	0.00	-45.25

Graphic 1: GHG Calculation based on land clearing alternatives

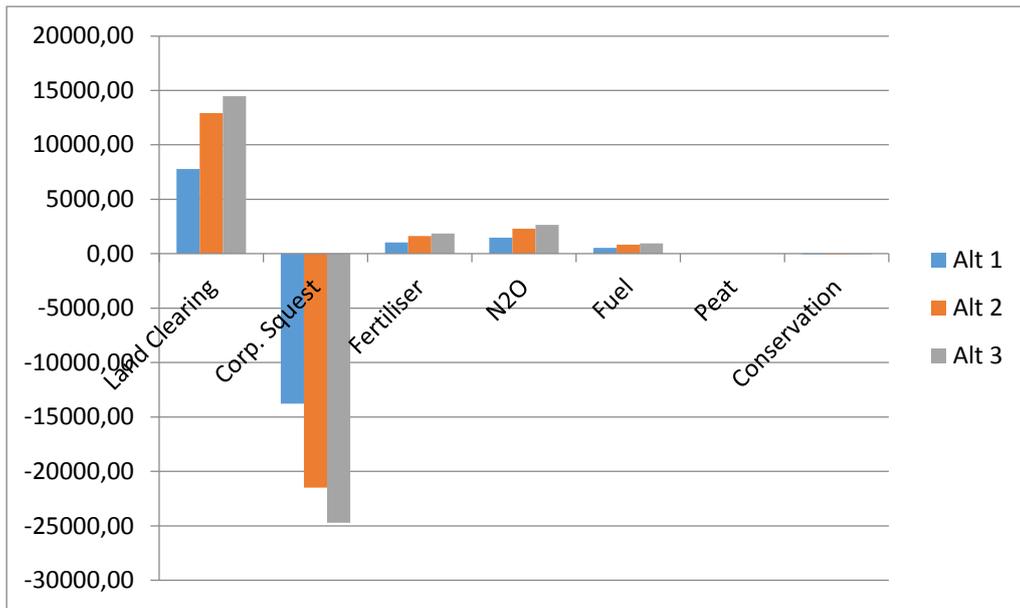


Table 39: Summary of Mill Emission by Alternatives

Alt.	POME	Mill Fuel	Electricity Purchased	Excess Electricity Released	Sale of Biomass for Electricity
Alt 1	7,218.00	64.34	0.00	0.00	0.00
Alt 2	11,244.79	100.23	0.00	0.00	0.00
Alt 3	2,440.66	115.32	0.00	0.00	0.00

Table 40: Total Emission per ton of product based on the land clearing alternatives

Alt.	Total Field Emission tCO ₂ e	Total Mill Emission tCO ₂ e	Net Emission	tCO ₂ /t FFB	tCO ₂ /t CPO	tCO ₂ /t PK
1	-3,011.77	7,282.33	4,270.57	-0.08	0.43	0.43
2	-3,880.16	11,345.02	7,464.86	-0.07	0.48	0.48
3	-4,840.77	2,555.99	-2,284.78	-0.07	-0.12	-0.12

Based on the GHG calculation, PT HPE will follow land clearance in accordance with the second alternative, with total emission produced from estate (plantation) -4,840.77 tonnes CO₂e. While the emissions per ton of product (FFB) is -0.07 tons CO₂e. This option fulfills the above stated criteria for land clearing and planting.

PT HPE has submitted its GHG Report for New Planting, which includes plans on how to mitigate its emission to the Emission Reduction Working Group (ERWG).

3.7 LUC Analysis

Changes in forest to non-forest land cover due to human activities have been known for a long time. Human activities on the land cover affect the type, intensity and frequency of changes in land cover. At PT HPE, mining activities that begin with small intensity with high frequency lead to changes in forest to non-forest land cover (deforestation). It increased in 2014, where an increase in the intensity of mining activities. It increased in 2014, where an increase in the intensity of mining activities. Almost the entire study area can be classified as damaged, then change the land cover of the area into a zircon (sedimenter that forms a white sandy expanse of sand when dry and brownish or blackish when wet).

Filed observation were conducted at 96 sample plots, representing 5 (five) identified land cover classes. Kappa accuracy test value obtained is 85.2% with the overall accuracy value of 89.6%. The value is in a substantial precision range. Accepted Kappa accuracy is > 60%. Errors in the interpretation process occur in the process classification of shrubs, bushes and oil palm, this is due to the similarity of the hue between the land cover when viewed from satellite imagery.

At the time of this assessment, PT HPE has not yet opened the land. Land clearing is done by the community (especially the Farmer Group of Sungai melayu) with oil palm around PT HPE area. In addition, land clearing included non-corporate clearance, in the form of natural land fire in 1997 and 2009.

Table 41: Historical Land Use Change in each cut-off date (in hectares), based on Permitted Location

Land Cover	Nov 2005	Nov 2007	Dec 2009	Jan-10	May 2014	Aug 2017	June 2018	Feb-19
Old Shrub	427.85	162.17	116.20	116,20	0	0	0	0
Young Shurb	1,142.68	1,561.02	885.30	839,55	1,348.24	1,654.50	1,666.11	1,679.87
Bush	133.61	307.58	295.75	295,75	370.07	292.16	204.64	204.64
Bare Land	705.25	378.63	1,112.15	1.157,90	69.09	462.73	538.65	524.89
Oil Palm	0	0	0	0	0	0	0	0
TOTAL	2,409.39							

Table 42: Raw land covers data per period on the potential development area

Periode November 2005 - October 2007 (in hectares)							
Corporate							
	Land cover class	October 2007					
		Old Shrub	Bushes	Young Shrubs	Bare Land	Oil Palm	Total Nov 2005
November 2005	Old Shrub	-	-	-	-	-	-
	Bushes	-	-	-	-	-	-
	Young Shrubs	-	-	-	-	-	-
	Bare Land	-	-	-	-	-	-
	Oil Palm	-	-	-	-	-	-
	Total Oct 2007	-	-	-	-	-	-
Non-Corporate							
	Land cover class	October 2007					
		Old Shrub	Bushes	Young Shrubs	Bare Land	Oil Palm	Total Nov 2005
November 2005	Old Shrub	162,17	184,34	62,46	18,89	0,00	427,85
	Bushes	0,00	123,24	1,12	9,25	0,00	133,61
	Young Shrubs	0,00	0,00	72,06	1070,63	0,00	1142,68
	Bare Land	0,00	0,00	426,82	278,44	0,00	705,25
	Oil Palm	0,00	0,00	0,00	0,00	0,00	0,00
	Total Oct 2007	162,17	307,58	562,45	1377,20	0,00	2409,39

Periode November 2007 - December 2009 (in hectares)							
Corporate							
	Land cover class	December 2009					Total Nov 2007
		Old Shrub	Bushes	Young Shrubs	Bare Land	Oil Palm	
November 2007	Old Shrub	-	-	-	-	-	-
	Bushes	-	-	-	-	-	-
	Young Shrubs	-	-	-	-	-	-
	Bare Land	-	-	-	-	-	-
	Oil Palm	-	-	-	-	-	-
	Total Dec 2009	-	-	-	-	-	-
Non-Corporate							
	Land cover class	December 2009					Total Nov 2007
		Old Shrub	Bushes	Young Shrubs	Bare Land	Oil Palm	
November 2007	Old Shrub	116,20	11,84	12,18	21,94	-	162,2
	Bushes	-	283,90	11,69	11,98	-	307,6
	Young Shrubs	-	-	817,09	743,93	-	1.561,0
	Bare Land	-	-	44,34	334,29	-	378,6
	Oil Palm	-	-	-	-	-	-
	Total Dec 2009	116,2	295,7	885,3	1.112,1	-	2.409,39

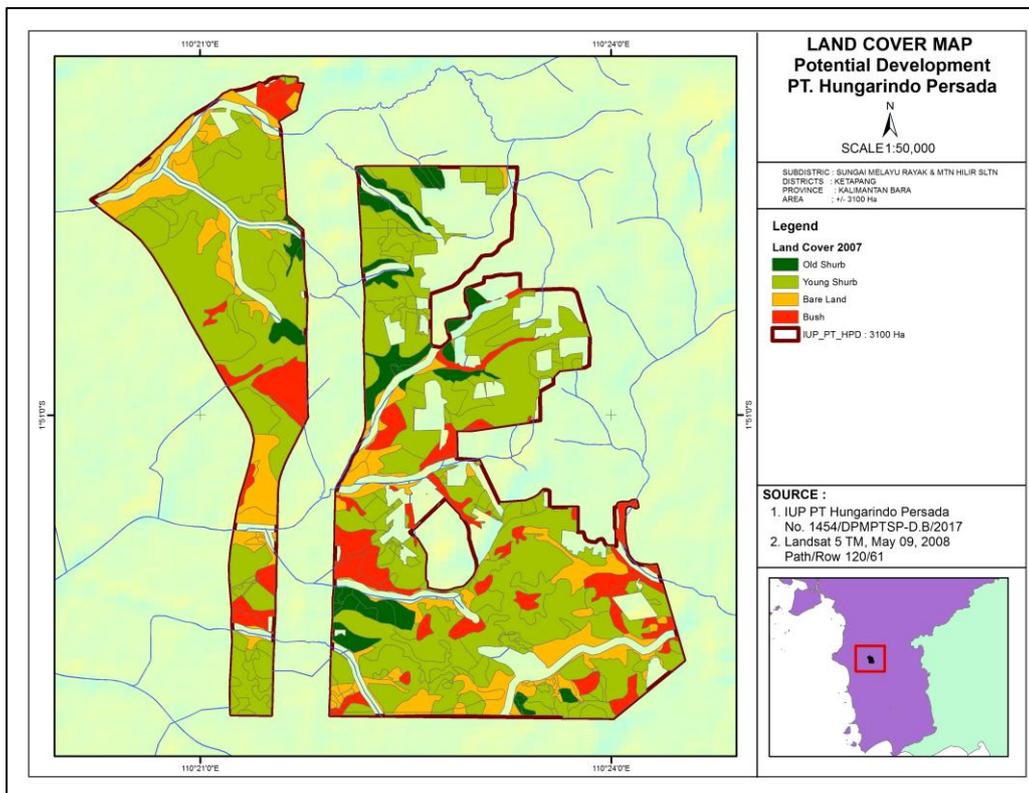
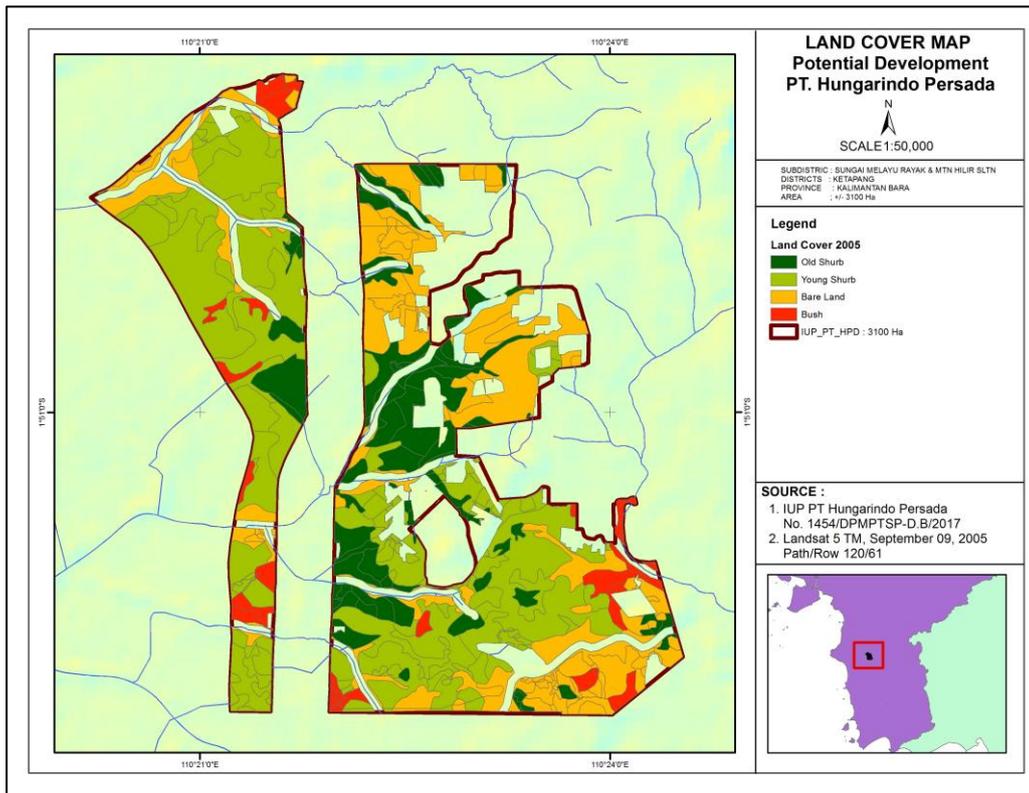
Periode January 2010 - May 2014 (in hectares)							
Corporate							
	Land cover class	May 2014					Total Jan 2010
		Old Shrub	Bushes	Young Shrubs	Bare Land	Oil Palm	
January 2010	Old Shrub	-	-	-	-	-	-
	Bushes	-	-	-	-	-	-
	Young Shrubs	-	-	-	-	-	-
	Bare Land	-	-	-	-	-	-
	Oil Palm	-	-	-	-	-	-
	Total May 2014	-	-	-	-	-	-
Non-Corporate							
	Land cover class	May 2014					Total Jan 2010
		Old Shrub	Bushes	Young Shrubs	Bare Land	Oil Palm	
January 2010	Old Shrub	-	104,88	11,32	0,00	0,00	116,20
	Bushes	-	265,19	0,00	30,56	0,00	295,75
	Young Shrubs	-	0,00	774,16	65,39	0,00	839,55
	Bare Land	-	0,00	562,76	595,14	0,00	1157,90
	Oil Palm	-	0,00	0,00	0,00	0,00	0,00
	Total May 2014	-	370,07	1348,24	691,09	0,00	2409,39

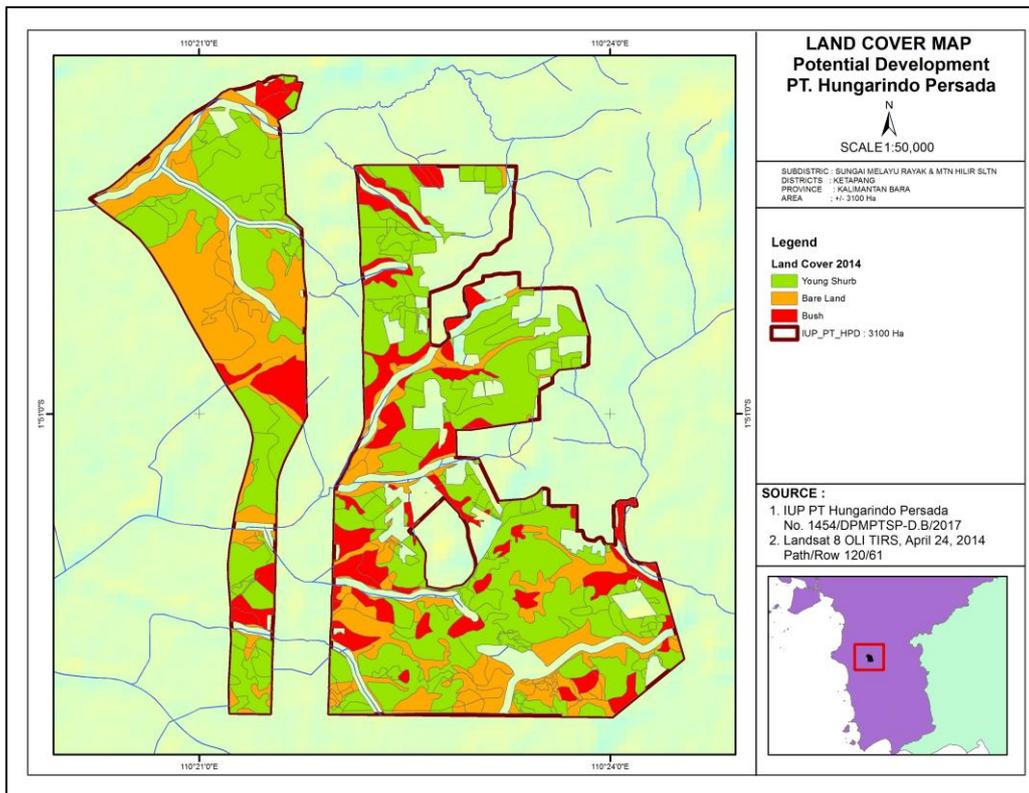
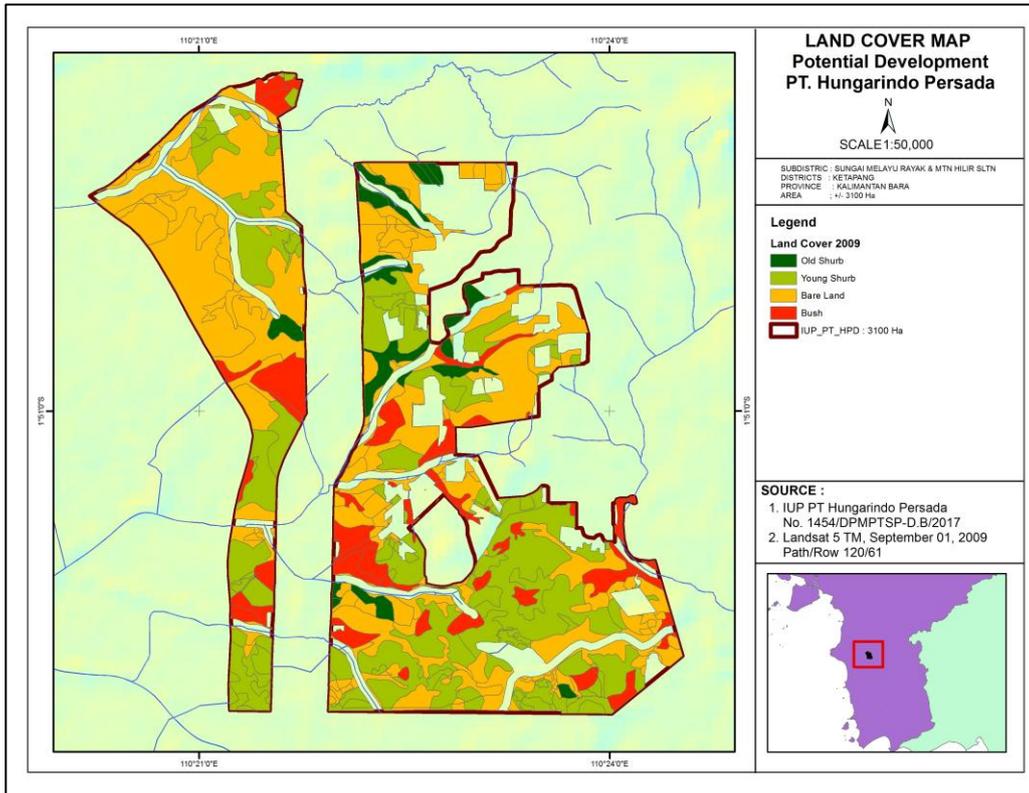
Periode May 2014 - HCV Assessment, August 2017 (in hectares)							
Corporate							
	Land cover class	August 2017					Total May 2014
		Old Shrub	Bushes	Young Shrubs	Bare Land	Oil Palm	
May 2014	Old Shrub	-	-	-	-	-	-
	Bushes	-	-	-	-	-	-
	Young Shrubs	-	-	-	-	-	-
	Bare Land	-	-	-	-	-	-
	Oil Palm	-	-	-	-	-	-
	Total Aug 2017	-	-	-	-	-	-
Non-Corporate							
	Land cover class	August 2017					Total May 2014
		Old Shrub	Bushes	Young Shrubs	Bare Land	Oil Palm	
May 2014	Old Shrub	-	-	-	-	-	-
	Bushes	-	292,16	66,99	10,92	-	370,07
	Young Shrubs	-	-	1.317,70	30,54	-	1.348,24
	Bare Land	-	-	269,82	421,27	-	691,09
	Oil Palm	-	-	-	-	-	-
	Total Aug 2017	-	292,16	1.654,50	462,73	-	2.409,39

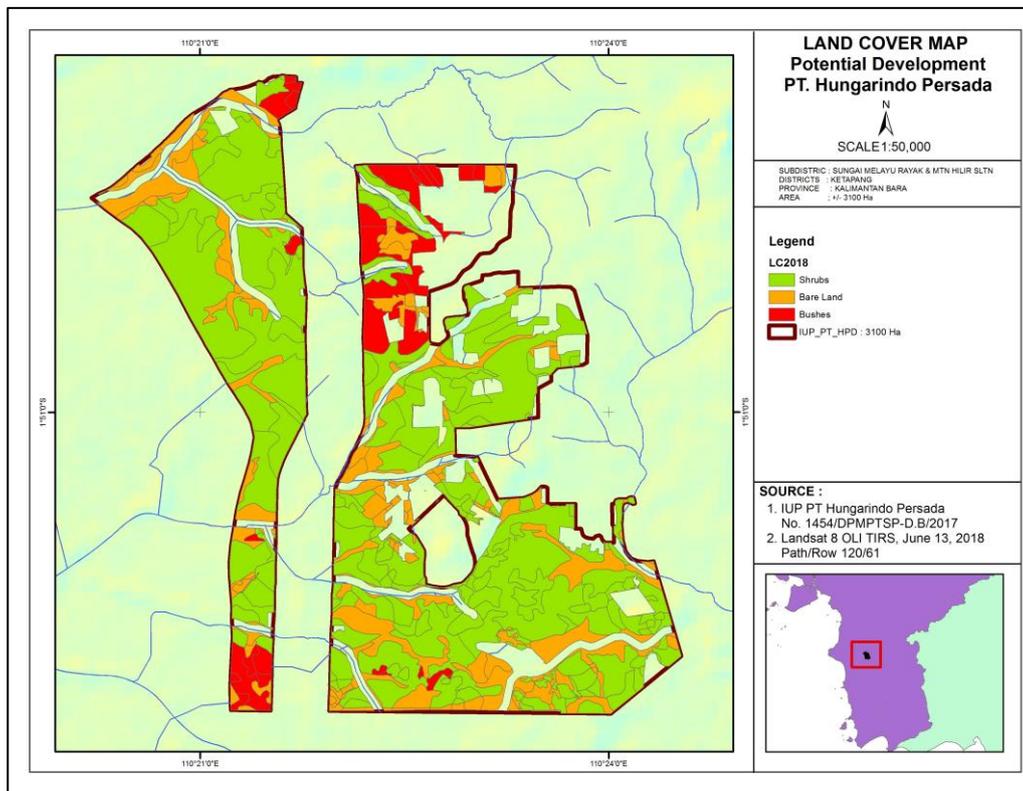
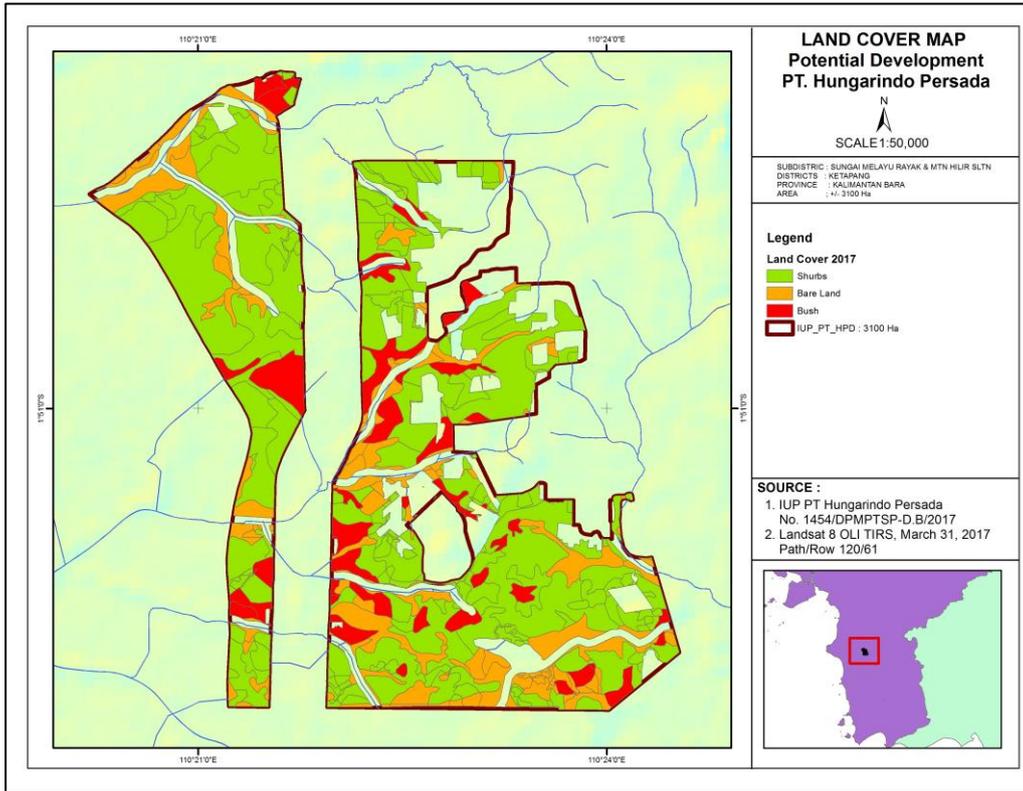
Periode August 2017 - June 2018 (in hectares)							
Corporate							
	Land cover class	Jun-18					
		Old Shrub	Bushes	Young Shrubs	Bare Land	Oil Palm	Total Aug 2017
August 2017	Old Shrub	-	-	-	-	-	-
	Bushes	-	-	-	-	-	-
	Young Shrubs	-	-	-	-	-	-
	Bare Land	-	-	-	-	-	-
	Oil Palm	-	-	-	-	-	-
	Total Jun 2018	-	-	-	-	-	-
Non-Corporate							
	Land cover class	Jun-18					
		Old Shrub	Bushes	Young Shrubs	Bare Land	Oil Palm	Total Aug 2017
Augustus 2017	Old Shrub	-	-	-	-	-	0,00
	Bushes	-	12,76	276,88	2,52	-	292,16
	Young Shrubs	-	190,13	1374,14	90,24	-	1654,50
	Bare Land	-	1,75	15,10	445,89	-	462,73
	Oil Palm	-	-	-	-	-	0,00
	Total Jun 2018	0,00	204,64	1666,11	538,65	0,00	2409,39

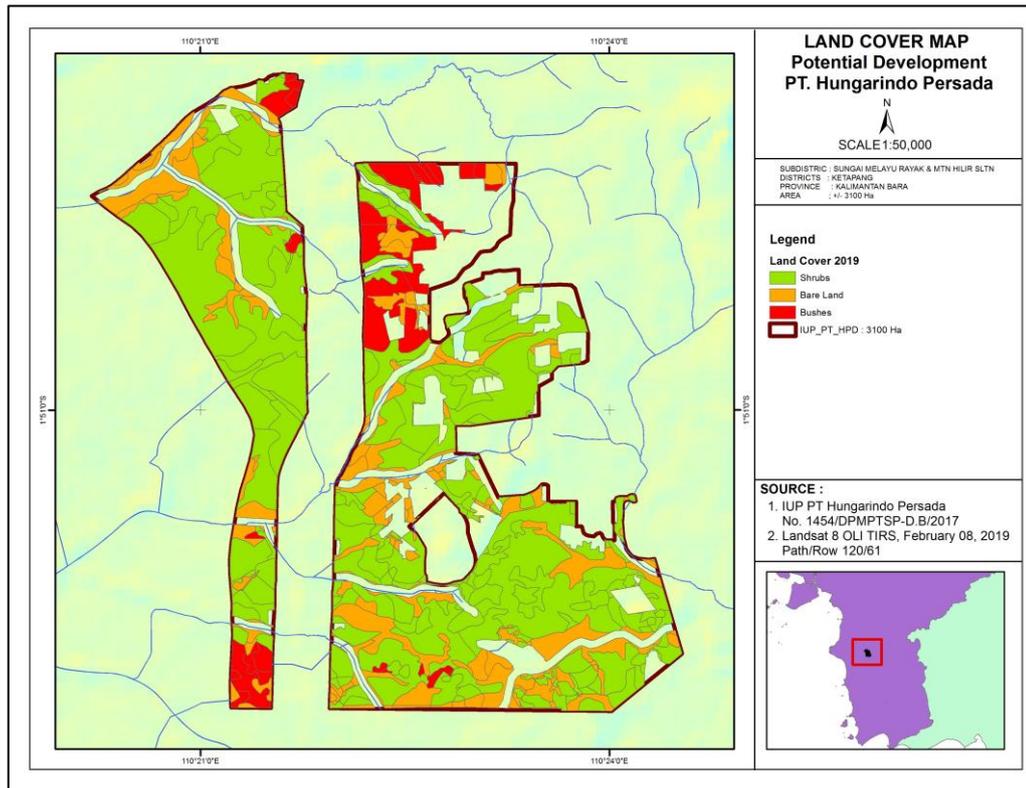
Periode June 2018 - February 2019 (in hectares)							
Corporate							
	Land cover class	Feb-19					
		Old Shrub	Bushes	Young Shrubs	Bare Land	Oil Palm	Total Jun 2018
Jun-18	Old Shrub	-	-	-	-	-	-
	Bushes	-	-	-	-	-	-
	Young Shrubs	-	-	-	-	-	-
	Bare Land	-	-	-	-	-	-
	Oil Palm	-	-	-	-	-	-
	Total Feb 2019	-	-	-	-	-	-
Non-Corporate							
	Land cover class	Feb-19					
		Old Shrub	Bushes	Young Shrubs	Bare Land	Oil Palm	Total Jun 2018
Jun-18	Old Shrub	-	-	-	-	-	0,00
	Bushes	-	204,64	-	-	-	204,64
	Young Shrubs	-	-	1666,11	-	-	1666,11
	Bare Land	-	-	13,76	524,89	-	538,65
	Oil Palm	-	-	-	-	-	0,00
	Total Feb 2019	0,00	204,64	1679,87	524,89	0,00	2409,39

Map 20: Time Series LUC Analysis on the potential development area









3.8 FPIC Process

PT HPE has started to conduct the socialization before obtaining the Location Permit in November 2016, in a formal and informal way. Formal way is done through a meeting forum between the management of PT HPE and the government level at the district, sub-district and village levels, while informal socialization is done through visits to hamlets in two villages located in the study area by company public relations officers. Public Relation Officer is a local people who are recruited by the company from each hamlet whose area is located around the location permit area of PT HPE. First socialization is in Village of Kemuning Biutak on 18 October 2015 then following with Sungai Melayu Rayak on 18 January 2016.

The socialization forum with the government was including the licensing that has been owned by the company either licensing business entity or licensing related to land legality. Other things that were presented are the plan of oil palm plantation development, partnership mechanism, land requirements and agreed on the value of land compensation on the community's land.

PT HPE also facilitates participatory mapping in an effort to agree on the village boundary of Kemuning Biutak Village and Sungai Melayu Village, which was conducted on 1 August 2016, involving village officials and administrators of the Regional Development Board (BPD) witnessed by the Adat Council. The Company cooperates with the Satlak Desa Team to carry out community land disposal through identification processes, land measurement and verification, from which the spatial data obtained from community land in the form of maps.

Until now (end of 2018), PT HPE has acquired land (GRTT) for plantation development of 2,595.22 ha, with details 2016 for area 2,083.05 ha and 2017 for area 512.17 ha.

4. Summary of Management Plans

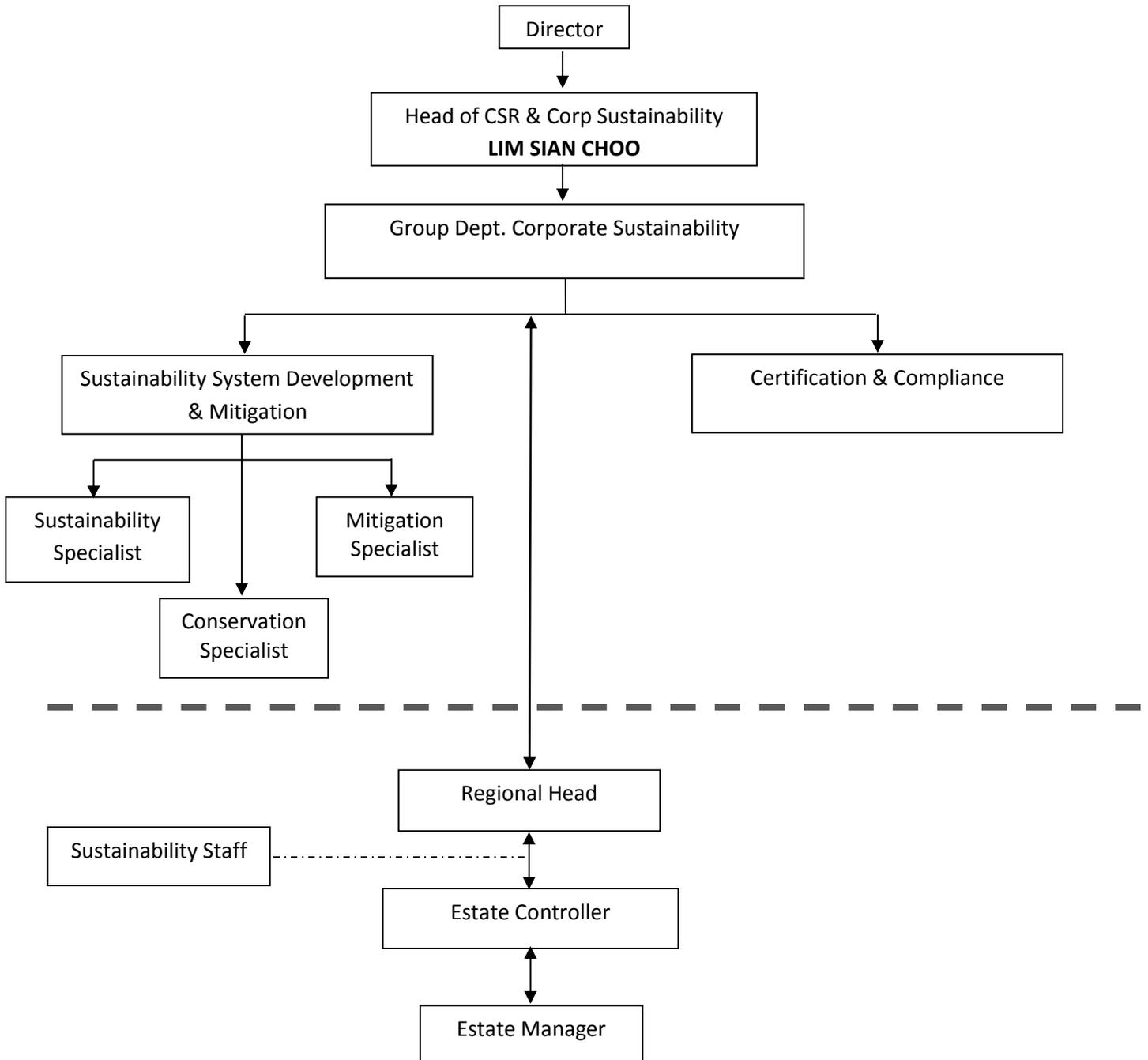
4.1 Team Responsible for Developing Management Plans

The process of HCV and SIA development and preparation of management and monitoring plans for PT HPE 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 43: The Participatory List of developing management and monitoring plans for PT HPE

No.	Name	Department/ Expertise	Officeal Role
HCV Management & Monitoring Plan			
1	Wedy Sulistyو	Regional Head	Participant
2	Suyitno	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
8	Manguhal Nikolas Sitompul	Sustainability Staff at PT HPE	Participant
SIA Management & Monitoring Plan			
1	Wedy Sulistyو	Regional Head	Participant
2	Suyitno	Area Controller	Participant
3	Agus Wiastono	Head of CSR	Participant
4	Gabriel Heru Prasetyo	CSR Specialist	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 HPE 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 HPE and stakeholders. Focus Group for Discussion consisted of people who were respondents (the workers, local communities and local government).

Table 44: Summary of Management and Mitigation Plans on Social Impact Assessment

Program	Activity	Opportunity	Challenges	Strategy	Output	Timeline
Resolve tenure issues around the company	Inventory and resolve double claims problems	<ul style="list-style-type: none"> a. There is a double claim on the land that is the plantation development plan b. The community considers the price of land compensation to be too low and unfair between each landowner 	<ul style="list-style-type: none"> a. Relations between the company and village officials and community leaders are quite good b. The company's land has clear legality c. Local government and security forces support the company's activities 	<ul style="list-style-type: none"> a. Communicate intensively with communities who still make land claims / are not yet willing to release their land in accordance with the principles of FPIC b. If the deliberation process did not come to fruition, pursued legal proceedings c. Do not carry out coercion and intimidation in the process of settling land claims d. Establish communication and involve village officials, community leaders and law enforcement agencies in resolving cases e. Documenting all processes for resolving land claims cases 	<ul style="list-style-type: none"> a. Completion of existing tenure issues at PT. Hungarindo Persada fairly and according to regulations b. Document for settlement of land claims cases 	2019
Increasing community economy	Capacity building in order to create business opportunities and alternative livelihoods (Training)	<ul style="list-style-type: none"> a. Knowledge and skills of the community in entrepreneurship are still lacking b. Continuous assistance is needed c. Strong marketing network needs to be built 	<ul style="list-style-type: none"> a. There are local leaders who have good capacity b. The potential for businesses in production and services is quite large c. Good accessibility 	<ul style="list-style-type: none"> a. Selection of prospective participants who have seriousness b. Conduct entrepreneurship training activities c. Melakukan pendampingan d. Facilitate business capital and equipment e. Continuous mentoring activities both in terms of production and marketing 	The creation of opportunities for alternative community income and an increase in community income	2019 and continuous
	Build demonstration plots to develop superior rubber, fisheries, livestock and vegetables / fruits	Training is needed and infrastructure is inadequate	Good potential & market points	<ul style="list-style-type: none"> a. Prepare institutions and organizations at the community level b. Training on the development of superior rubber and fisheries (cages), livestock, and vegetables / fruits c. Continuous assistance 	Alternative livelihood	2019 and continuous

Program	Activity	Opportunity	Challenges	Strategy	Output	Timeline
	Facilitating youth who have the potential and willingness to take part in training at the Vocational Training Center for example in the fields of mechanics, welding, processed products	<ul style="list-style-type: none"> a. The level of formal education of youth is relatively low b. The needs and desires of the people are quite varied 	Business opportunities in the service sector are quite large	Building cooperation and communication with the Vocational Training Center	Increased skills of young people around PT. Hugarindo Persada	2019 and continuous
Improve the quality of public education	Make plans for developing education for the community around the company	<ul style="list-style-type: none"> a. Educational facilities are relatively low b. The dropout rate is quite high c. Community interest in education is quite varied 	<ul style="list-style-type: none"> a. The company's commitment regarding the development of education is quite high b. There are people who have the motivation and potential to continue their education level c. Support national programs 	<ul style="list-style-type: none"> Involve the government and community leaders in implementing the program Make priority scale in accordance with the ability of the company 	Documents for review of plans for developing quality education for the community around PT HPE	2019
	Providing assistance for the development of educational facilities	Low educational support facilities	Educational facilities and activities are underway	Plans to develop educational facilities according to priority based on mapping	Increased educational facilities in villages around PT HPE	2019 and continuous
	Adding honorarium assistance for schools that have a shortage of teachers	Lack of teachers in rural schools around the company, such as an English teacher.	There are temporary employees who have the potential and strong motivation to teach	<ul style="list-style-type: none"> a. detailed plan for providing assistance b. selection by involving the parties involved 	Increased quality of public education and increasing quantity of teaching for students	2019
Improve the quality of public health	Conduct health and medical checks to the community	<ul style="list-style-type: none"> a. Public awareness and knowledge about health is still low b. Health facilities are still low 	<ul style="list-style-type: none"> a. Facilities and corporate networks in the health sector are quite adequate b. There are many partners who can be invited to work together 	<ul style="list-style-type: none"> a. Determine the priority location b. Carry out activities in collaboration with local health offices (Puskesmas & Hospitals) 	<ul style="list-style-type: none"> a. Increased quality of public health b. Documentation of activities. for example free treatment, mass circumcision, etc. 	2019

Program	Activity	Opportunity	Challenges	Strategy	Output	Timeline
	Conduct counseling and socialization of dangerous diseases	Public awareness and knowledge about health is still low	<ul style="list-style-type: none"> a. Facilities and corporate networks in the health sector are quite adequate b. There are many partners who can be invited to work together 	Determine counseling material that is most needed by the community	Increased public knowledge of dangerous diseases	2019 and continuous
Increase the preservation of local culture of the local community	Preserving sites / places of local culture of the local community and supporting activities related to the local culture of the community	<ul style="list-style-type: none"> a. The need for land for plantations is quite high b. Public awareness of the importance of maintaining local cultural sites / sites still needs to be improved 	<ul style="list-style-type: none"> a. The company's commitment is quite high b. There are community leaders who deeply care about the preservation of places that are related to local culture 	<ul style="list-style-type: none"> a. Conduct an inventory of sites / places that have local cultural values in a participatory manner b. Involve the community, traditional leaders, village officials in determining inventory, and future maintenance plans c. Support and get involved in local cultural activities, such as the gawai dayak traditional ceremony, etc.. 	Document of inventory results and documents on plans for maintenance and development	2019
Increase the availability of clean water	Conduct groundwater management / conservation	Most of the surrounding communities experience water difficulties, especially in the dry season	<ul style="list-style-type: none"> a. The company's commitment is quite large b. Facilities owned by the company are quite adequate c. There are water sources outside the company's area that can be utilized with the help of supporting technology from the company 	<ul style="list-style-type: none"> a. Providing clean water to the community (making wells and making dams and plumbing) b. Cooperating with Village Institutions in monitoring river water quality c. Maintain water flow and the existence of water (river) as long as possible, so that water infiltration occurs in the ground (ground water) 	<ul style="list-style-type: none"> a. Clean water facilities for the community is increasing b. Availability of clean water for the community is guaranteed. 	2019
Building communication and networking with all stakeholders related to PT HPE	Conduct regular meetings with stakeholders	Different of types and characteristics of stakeholders	Stakeholders support the existence of the PT HPE	<ul style="list-style-type: none"> a. Make a regular schedule and determine the theme for each meeting b. Follow up on the results of the meeting 	Good communication and coordination between companies and all stakeholders	2019

Program	Activity	Opportunity	Challenges	Strategy	Output	Timeline
Improving of the employment site	Increase employee knowledge and understanding of labor regulations	Knowledge and understanding of employees towards labor regulations is not evenly distributed	The company has has a labor rerulation and it is followed the government's labor rules	<ul style="list-style-type: none"> a. Make a schedule of socialization of labor regulations to employees b. Make a pocket book on labor regulations 	<ul style="list-style-type: none"> a. Increased knowledge and understanding of employees towards labor rules. b. Increased quality of work performance 	2019
	Increase the role and function of trade unions	Unions have not yet been formed	Companies and employees will soon form a union	<ul style="list-style-type: none"> a. Accelerating the formation of trade unions (organizations, administrators, members and work programs) b. To schedule regular meetings between companies and trade unions c. Facilitating the operational needs of trade unions 	Increased role and function of trade unions	2019
	Improve employee work safety	<ul style="list-style-type: none"> a. Employee knowledge about work safety is not evenly distributed b. Training on work safety has not been conducted regularly 	There is already a commitment from the company to improve employee safety	<ul style="list-style-type: none"> Conduct periodic work safety training Make a work safety pocket book 	<ul style="list-style-type: none"> a. Increased safety of the work environment b. Declining work accidents 	2019
	Improving Employee Health	<ul style="list-style-type: none"> a. Health facilities and personnel do not yet exist b. Employee knowledge about health is still lacking 	The company's commitment is very high, to improve health services for employees	<ul style="list-style-type: none"> a. Improvement of health facilities and the addition of health workers at the company Clinic b. Conduct training on health to employees, in collaboration with the local health office c. Providing 24-hour health services to employees in collaboration with Puskesmas and Hospitals 	<ul style="list-style-type: none"> a. Increased in facilities and health personnel b. Increased awareness and knowledge of employees about health c. Increased in health services 	2019

Program	Activity	Opportunity	Challenges	Strategy	Output	Timeline
	Improving Self Protection Equipment (PPE) facilities	The discipline of employees in using PPE is still lacking	There is a commitment from the company to increase the willingness of PPE and improve employee discipline in using PPE	<ul style="list-style-type: none"> a. Socialization on the importance of using PPE b. Provision of PPE in accordance with plans and needs, including for reserves. c. Socialization of the use of PPE, evaluation and sanctions for violators 	<ul style="list-style-type: none"> a. Increased safety of the work environment b. Declining work accidents 	2019

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 1415/DPMPTSP-D/2017, dated: 10 Oktober 2017.

Table 45: Summary of Management and Mitigation Plans on Environment Impact Assessment

No	Impact	Source of Impact	Location	Environment Management		Environment Monitoring	
				Plan	Period	Indicator & metode	Period
1	People's behavioral and perception, also Social Conflict	<ul style="list-style-type: none"> - Operational socialization - Company's delineation, land acquisition - Land clearing - Transportation of FFB - De-mobilization of equipment 	Villages of Sungai Melayu, Sub-district of Sungai Melayu Rayak and Village of Kemuning Biutak, Sub-district of Matan Hilir Selatan	<ul style="list-style-type: none"> - 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 during the land acquisition	Increasing the positive perception of the public against the plantation activities. Methods: observation and interviews	Once during socialization and land acquisition phase.

2	Increased of job opportunities	<ul style="list-style-type: none"> - Oil palm cultivation - Employee recruitment 	Local people from Villages of Sungai Melayu, Sub-district of Sungai Melayu Rayak and Village of Kemuning Biutak, Sub-district of Matan Hilir Selatan	<ul style="list-style-type: none"> - Transparently open recruitment - Give the priority to local 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	<ul style="list-style-type: none"> - 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
3	Ambient air quality	<ul style="list-style-type: none"> - Land clearing - Mobilization of heavy equipment and materials - Land clearing - Transportation of FFB - De-mobilization of equipment 	Emplacement and the area around operational area.	<p><u>Technology approach:</u></p> <ul style="list-style-type: none"> - 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 <p><u>Socio-economic approach:</u></p> <ul style="list-style-type: none"> - 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 	<p>Regularly watering the roads during the land clearing phase</p> <p>Once every 3 months on dry season and once every 6 months on rainy season</p>	<ul style="list-style-type: none"> - 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 <p><u>Location of air quality test:</u> UD-1: 110°21'31.28" E and 1°49'5.39" S UD-2: 110°25 11.20" E and 1°50'18.67" S UD-3: 110°23' 15.74" E and 1°50'46.84" S</p>	<ul style="list-style-type: none"> - Once per 6 months. - Reporting to relevant agencies: once per 6 months
4	Increased rate of noise level	<ul style="list-style-type: none"> - 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	<p><u>Technology approach:</u></p> <ul style="list-style-type: none"> - 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 infrastructure construction phase	<ul style="list-style-type: none"> - Parameters of noise levels in accordance with laws and regulations (PP No. 41 Thn 1999) <p><u>Location for noise level test:</u> UD-1: 110°21'31.28" E and 1°49'5.39" S UD-2: 110°25 11.20" E and 1°50'18.67" S UD-3: 110°23' 15.74" E and 1°50'46.84" S</p>	<ul style="list-style-type: none"> - Once per 6 months. - Reporting to relevant agencies: once per 6 months

5	Public health level (include workers)	<ul style="list-style-type: none"> - Mobilization of heavy equipment and materials - Maintain oil palm plants 	Plantation area and around	<p><u>Technology approach:</u></p> <ul style="list-style-type: none"> - Routine medical check up to the workers - Socialization of the important to wear PPE - Provide the medical clinic <p><u>Socio-economic approach:</u></p> <ul style="list-style-type: none"> - 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. <p><u>Instituional approach:</u></p> <ul style="list-style-type: none"> - Working closely with agencies such as health centers in the preparation of medical personnel and clinics 	Four times during construction phase	<p>Decrease levels of public health and workers by the increasing number of visits due to respiratory diseases.</p> <p>Methods:</p> <ul style="list-style-type: none"> - Medical check up for the workers - data analysis from the company clinic 	Once per 6 months
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6	Decrement of Water quality & aquatic biota	<ul style="list-style-type: none"> - Land clearing - Nursery activity - Maintaing oil palm plants 	Lokasi pemantauan di lakukan di areal Sungai Kepuluk, Sungai Kekulu, Sungai Bengkuang dan anak Sungai Benapang.	<p><u>Technology approach:</u></p> <ul style="list-style-type: none"> - No land clearing on the riparian area/ greenbelt. Put the signboard of prohibition to damage the riparian area - 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 <p><u>Socio-economic approach:</u></p> <ul style="list-style-type: none"> - 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 	<ul style="list-style-type: none"> - Once every 3 months on dry season and once every 6 months on rainy season - POME test: once per month 	<ul style="list-style-type: none"> - There are no water pollutan by chemicals, waste, POME and any other opertional activities impacts. - Environmental quality analysis reports to relevant agencies <p>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).</p> <p>Location of air quality test:</p> <ul style="list-style-type: none"> - KA-1: 110°20'10.59" E and 1°49'25.61" S - KA-2: 110°20'42.31" E and 1°49'11.47" S - KA-3: 110°21'47.59" E and 1°49'42.50" S - KA-4: 110°21' 50.10" E and 1°48'55.79" S - KA-5: 110°21'10.77" E and 1°51'50.26" S - KA-6: 110°21'59.82" E and 1°51'32.95" S - KA-7: 110°22'40.80" E and 1°50'34.93" S - KA-8: 110°22'43.37" E and 1°50'36.37" S - KA-9: 110°23'31.70" E and 1°49'35.38" S - KA-10: 110°23'43.70" E and 1°49'49.23" S - KA-11: 110°23'49.13" E and 1°50'15.15" S - KA-12: 110°24'12.02" E and 1°50'55.81" S - KA-13: 110°21'7.94" E and 1°52'34.26" S - KA-14: 110°21'46.45" E and 1°52'40.21" S - KA-15: 110°23'46.08" E and 1°52'43.23" S - KA-16: 110°24'37.13" E and 1°52'19.69" S 	<ul style="list-style-type: none"> - Once per 3 months. - Reporting to relevant agencies: once per 6 months
7	Increased rate of erosion	<ul style="list-style-type: none"> - Land clearing - Construction of operational facilities & infrastructure 	Plantation Area	<p><u>Technology approach:</u></p> <ul style="list-style-type: none"> - Land clearance without destructive the topsoil - Maintaining the drainage and roads through road hardening, to reducing the erosion rate 	Continuous during land clearing phase	Measuring the erosion rate	Once per 6 month

8	Land and forest fire potential	<ul style="list-style-type: none"> - Land clearing - Construction of operational facilities & infrastructure - Replanting 	Plantations area and around	<p><u>Technology approach:</u></p> <ul style="list-style-type: none"> - Land clearing without burning - Construction the fire tower control - 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 (<i>Lampiran 7</i>) - Periodically patroli especially on dry season <p><u>Socio-economic approach:</u></p> <ul style="list-style-type: none"> - 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 <p><u>Institutional approach:</u></p> <ul style="list-style-type: none"> - 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	<p>There is no land fire in the company and around.</p> <p>Methods: field survey monitoring & online hot spot monitoring</p>	Continuous intensively, especially on dry season
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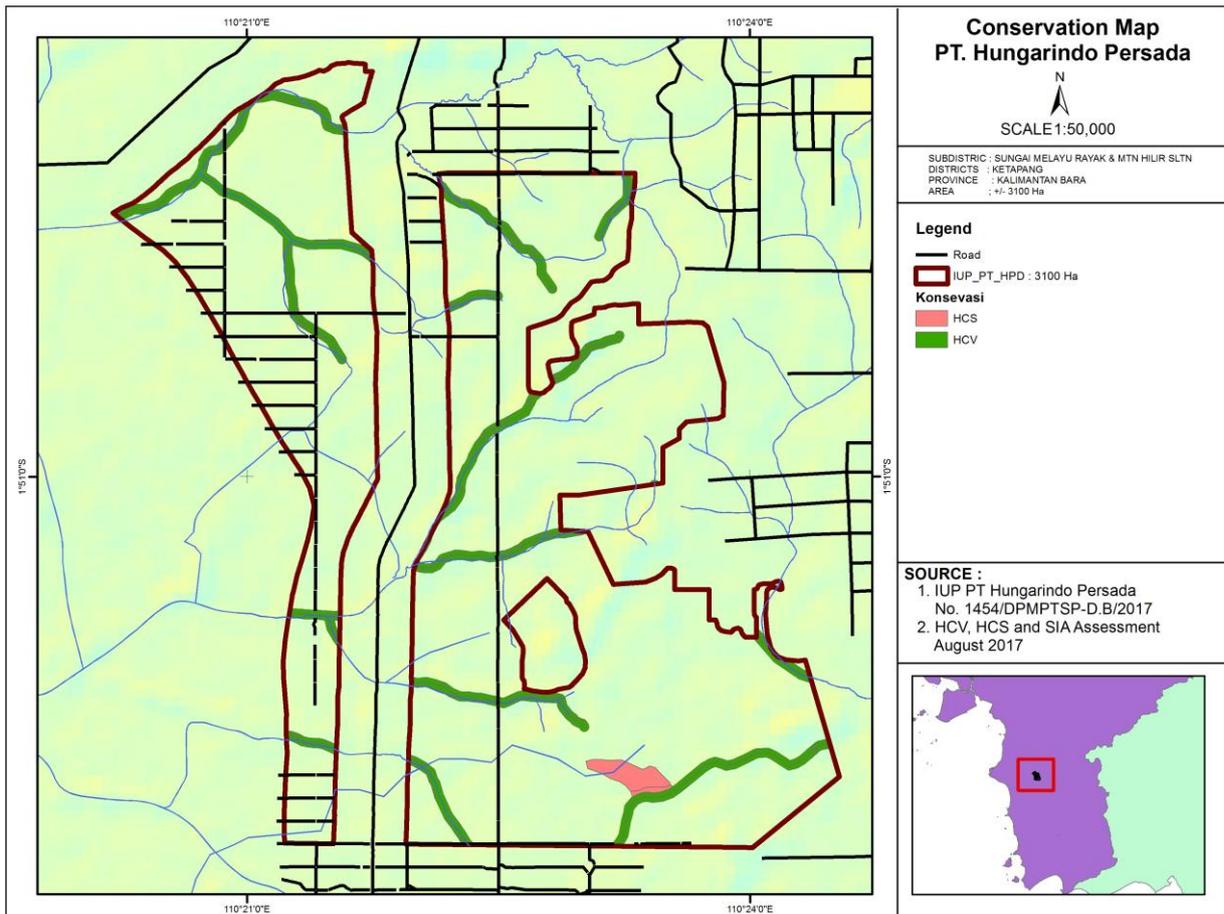
9	Biodiversity of Flora & Fauna	<ul style="list-style-type: none"> - Land Clearing - Construction of operational facilities & infrastructure 	Plantation Area	<p><u>Technology approach:</u></p> <ul style="list-style-type: none"> - Protection of flora & fauna on the area with good condition of ecology - 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 <p><u>Socio-economic approach:</u></p> <ul style="list-style-type: none"> - 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 <p><u>Institutional approach:</u> Involving the related agencies, in efforts to protect and preserve the protected flora & fauna around the operational area</p>	Once per 3 months, continuous intensively when its needed	<ul style="list-style-type: none"> - Biodiversity index of flora and fauna - Disruption to protected flora and fauna <p>Methods: field survey</p>	Once per 3 months, or continuous intensively when needed
	Pencemaran Toxic & Hazardous Waste	<ul style="list-style-type: none"> - Maintenance of oil palm plant 		<p><u>Technology approach:</u></p> <ul style="list-style-type: none"> - 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 HPE	-	
10	Pests diseases	<ul style="list-style-type: none"> - 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 opportunities	- 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	<ul style="list-style-type: none"> - 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	<ul style="list-style-type: none"> - 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	<ul style="list-style-type: none"> - 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	<p>There are no disputes and disagreement between the community with the company or with the workers in the company.</p> <p>Methods: observation and interviews</p>	Once during handling of fixed assets phase

4.2.3 High Conservation Value (HCV) Management & Monitoring Plans

In the area of PT Hungarindo, there are total 290.34 ha of HCV Area identified by consultant under the permitted location.

As the company commitment to sustainability development, aligned with its Sustainability Policy, PT HPE will manage and monitoring the defined of HCV area covering 248.28 ha under the plantation business permit of PT HPE. It aims to restore the function of river border and rivers themselves as environmental services.



Map 21: Conservation Area (HCV & HCS) in the Plantation Business Permit of PT HPE

Plan for Conservation Monitoring and Regular Review of Data

The basic programs and activities that fulfill the conservation management are monitored and review regularly. The purpose of review is to measure the achievements, effectiveness, efficiencies, impacts, and sustainability of the programs. Thus, the purpose of monitoring is to evaluate whether the activities are running as they are expected; whether the outputs of the process are as they were projected previously; and whether the resources investments (human, fund, time) are as they were planned.

Monitoring and review are aimed to a set of indicators as the key performance indicators and should be managed systematically, consistently, and are well documented. The monitoring should be implemented regularly and it is dependent on the classifications of the activities and the target indicator to evaluate. The review should be conducted at the end of the management periodical plan, that is in the end of the third year (summative review) and every six months (formative review).

Table 46: Summary of Management and Mitigation Plans on High Conservation Value (HCV) based on threatness

Threat	Plan to Manage	Plan to Monitor
• HCV 1 dan HCV 3		
RTE plant species (Shorea balangeran) are found only in the form of saplings scattered in certain spots and low population compared to other thicket vegetation. Degraded habitats do not allow these species to breed in the area.	<ul style="list-style-type: none"> In order not to compete with bushes and invasive species, temporary transitions into nurseries will be carried out and can be replanted as enrichment plants in HCV areas along river banks The plant seeds are maintained and cared for in place, by means of care / cleaning of competing weeds 	Periodically monitor the growth of RTE flora species (recording the number, location and addition of diameter and height)
Woody land cover loss and degradation of habitat	<ul style="list-style-type: none"> Applying soil and water conservation techniques with a vegetative approach and land and groove / river based technical civil Socialization, boundary marking and sign board installation for HCV area markers Prevention of illegal mines 	Patrol and coordinate with local authorities and communities around PT HPE
Land and Forest Fire	<ul style="list-style-type: none"> Coordinating and cooperating with the community about zero burning policy Forms and train the fire fighting team 	Patrol and coordinate with local authorities and communities around PT HPE, especially during the peak of the dry season
Animal Hunting	<ul style="list-style-type: none"> Ensure that there is no hunting of RTE species by all parties involved in the PT HPE area To socialize properly and targeted to the community as well as employees Designation of boundary stakes and sign board installation of HCV area markers and awareness of RTE species around HCV areas 	<ul style="list-style-type: none"> To monitor hunting activities against RTE species To monitor the population development of the species
HCV 4		

Threat	Plan to Manage	Plan to Monitor
Decrease in water quality	<ul style="list-style-type: none"> To collaborate with the community related to alternative work as a substitute for mining activities Socialization to the community related to concerning the existence and important functions of the river and its banks To make a sediment trap/gully plug in the flow lines or river branches Sign boards for prohibiting the use of chemicals on river banks and socialization to spraying employees 	<ul style="list-style-type: none"> To control and do the water quality test (once on 6 months), both with the visually and laboratory tests at water monitoring points, especially Kepuluk River, Bengkuang River, Jinap River. Documenting socialization with relevant stakeholders
Land conversion in the riparian area	<ul style="list-style-type: none"> To collaborate and work with the local community around the company, local government and local NGO relating to river conservation and protection programs Socialization to employees and land clearing contractors regarding riverbank boundaries to avoid over-clearing Enrichment of the vegetation along the degraded river banks (riparian) with the local species plants and/or plant with deep and strong roots, and lush canopy. Empowering the community around the company, in terms of providing local plant seeds for the maintenance/ rehabilitation of the degraded riparian areas 	<ul style="list-style-type: none"> Documenting socialization with relevant stakeholders To monitor the boundaries of the riverbank area periodically (at least once a month) To Accompany land clearing contractors and document the process of land clearing To monitor vegetation growth (% growth)
Siltation of water bodies	<ul style="list-style-type: none"> To make a sediment trap/gully plug in the flow lines or river branches Regular maintenance of rivers and ditches by normalizing rivers (dredging) 	Measure the level of sedimentation at the control points
Land and forest fire	<ul style="list-style-type: none"> Establishment of land fire mitigation and task forces supported by training and facilities Socialization of land fire hazards and installation of sign boards related to land fires Coordinating and cooperating with the community about zero burning policy Maintenance of areas that can potentially be artificial firebreaks, such as plantation roads or elephant trenches, Mapping locations of water sources for handling land fires. Former mining pools can be an alternative source of water for fire emergency response teams Implement fire information systems, including early warning systems 	<ul style="list-style-type: none"> To documenting number fire incident equipped with minutes (reports) Coordinate with the government, both local and regional levels, to mitigate forest and land fires Regularly patrolling during the dry season (June-October) Monitor the maintenance of firebreaking areas every 2 weeks Monitoring water discharge in water source locations for handling land fires

4.2.4 Soil Management and Monitoring Plans

To manage oil palm planting on sandy soil, Bumitama as a Head Company of Hungarindo already has the Standard Operation Procedure (SOP), BGAAGRKS-SOP-16 "Pengelolaan Lahan Marjinal". Based on the SOP, the sandy land which plan to be planted by oil palm will be managed as follows:

- a. Land clearing will be done by manual process
- b. In the sandy area which have hardpan layer, need to built a discontinue ditches
- c. Making the planting hole with a "big hole"
- d. The use of empty bunch
- e. Vegetation management "ground management" (soil and water conservation)Micro fertilization and CRF
- f. Planting for Mucuna bracteata

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 12,912.45 tCO₂e

Target	: Reduction of emissions from land clearing activities
Action Plan	: <ul style="list-style-type: none">▸ No land clearing of conservation area▸ Management plan of conservation areas. For ex: Enrichment of the vegetation along the degraded river banks (riparian) with the local species plants; ensure that there is no hunting of RTE species by all parties involved; zero burning policy.▸ Development of fire mitigation and completion of firefighting equipment

b. Carbon Crop Sequestration

Carbon crop sequestration contributes to emissions reductions to -21,481.97 tCO₂e

Target	: Incease of carbon crop sequestration
Action Plan	: <ul style="list-style-type: none">▸ Use of seeds with high production potential

c. Fertiliser

Fertiliser manufacturing and emisions from aplication of fertiliser

Target	: Emission reduction from fertilising
Action Plan	: <ul style="list-style-type: none">▸ Leaf & soil analysis to obtain the data of optimal amounts of fertiliser applied;▸ Empty bunch used for mulching (composting)▸ Fertilisers application thechnique based on topography

d. Diesel Consumption in Operation

Fuel Consumption in the field contributed to 823.32 tCO₂e

Target	: Reduction of emission from Diesel Consumption in Operation
Action Plan	: <ul style="list-style-type: none">▸ Good maintenance of vehicles and other equipment, periodically▸ Safety of driving related training

e. HCV Crop Sequestration

Land conversion appeared as the largest emission factor contributing to -45.25 tCO₂e

Target	: Increase of carbon sequestration
Action Plan	: Rehabilitation on the HCV Areas that are open land or covered with grass

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 2019 - December 2020 (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 2019 - December 2020 by QC Dept.
To monitor the realisation of oil palm planting & legume cover crops	April 2019 - December 2019 by QC Dept.
To minimise FFB losses	On mature plant (2022) by QC Dept

c. Fertiliser

Monitoring fertiliser 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	Since first time of application by Quality Control Dept.
▸ To monitor plan and realisation of fertiliser application	Every fertiliser application by Quality Control 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 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 Assessment (EIA), Social Impact Assessment (SIA), High Conservation Value (HCV), Land Use Change Analysis (LUCA) and High Carbon Stock (HCS) in PT Hungarindo Persada – District of Ketapang, West Kalimantan Province and has been approved by the Management of PT Hungarindo Persada.

Gagas Dinamiga Aksenta



Nandang Mulyaha

Team Leader of Assessments
Date: 20 February 2019

Management PT Hungarindo Persada

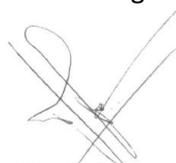


Wedy Sulisty

Director
Date: 20 February 2019

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

Management PT Hungarindo Persada



Wedy Sulisty

Director
Date: 20 February 2019

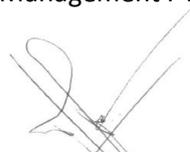
Document of Management Plans of Assessment, has been proposed and approved by the Management of PT Hungarindo Persada.

Management PT Hungarindo Persada



Lim Sian Choo

Head of CSR and
Corp. Sustainability
Date: 20 February 2019



Wedy Sulisty

Director
Date: 20 February 2019

Appendix 1: List of Stakeholders Involved

No	Nama	Jabatan/Posisi	Alamat	No	Nama	Jabatan/Posisi	Alamat
1	Suyitno	Senior Manager	PT HPD	31	Surono	Kaur Umum	Kemuning Biutak
2	Pradana H	PAD	PT HPD	32	Suta	Staf Desa	Kemuning Biutak
3	Dhenda Mahardika	Kasi	PT HPD	33	Aristo	Sekdes	Kemuning Biutak
4	Ahmad Yani	Asisten GIS	PT HPD	34	Hardianto Ardi	Kasi	Kemuning Biutak
5	Ria Septiana	Admin	PT HPD	35	Wina	Guru SD	Kemuning Biutak
6	Alek Wahyudi	Mandor 1	PT HPD	36	Herdalina	Guru SD	Kemuning Biutak
7	Ari Santoso	Mandor	PT HPD	37	Lizwar Amin	Masyarakat	Kemuning Biutak
8	Irfan S Marpaung	Mandor	PT HPD	38	Ipul	Masyarakat	Kemuning Biutak
9	Suyatno	Asisten Agronomi	PT HPD	39	Angguy	Masyarakat	Kemuning Biutak
10	Yohanes M	Karyawan	PT HPD	40	Munajad	Petani dan pemilik lahan	SP 6
11	Cicilia Ayu	Karyawan	PT HPD	41	Ngasimah	Petani dan Pemilik Lahan	SP 6
12	Feri Andriawan	Mandor	PT HPD	42	Saeful	Masyarakat	Sungai Melayu Baru
13	Aliak	Humas	PT HPD	43	Taufik	Karyawan	PT HPD
14	Andi	Pedagang di lokasi Tambang	Ketapang	44	Bernard	Karyawan	PT HPD
15	Ahmad	Penambang	Ketapang	45	Yosep Bucu	Ketua BPD Desa Sungai Melayu	Sungai Melayu
16	Rukayah	Pedagang di lokasi Tambang	Ketapang	46	Tajul	Anggota Satlak Desa Melayu	Sungai Melayu
17	Kumpul	Warga pemilik kebun sawit	SP 6	47	Yohanes	Anggota Satlak Desa Melayu	Sungai Melayu
18	Imam Rafii	Tokoh Masyarakat	Sp 6	48	Arman	Masyarakat	Sungai Melayu
19	Gabun	Mantir Adat	Sungai Melayu	49	Asjal	Masyarakat	Sungai Melayu
20	Samad	Pemilik Lahan yang diserahkan	Kemuning Biutak	50	Nikolaus Suhur	Ketua DAD	Sungai Melayu
21	Saparudin	Kadus Biutak Jaya	Kemuning Biutak	51	Ajis Godik	Ketua DAD	Kemuning Biutak
22	Eni	Pedagang di SP1	Sungai Melayu Baru	52	A Kidung	Kadus	Sungai Melayu
23	Sarwa	Tokoh Masyarakat (mantan Kades)	Sungai Melayu Baru	53	R Arman	Masyarakat	Dsn Kemuning Jaya
24	Dede	Pengusaha (Ketua Koperasi SMJ)	Sungai Melayu Baru	54	Antan Juliansyah	Mandor	Kemuning Biutak
25	Supri	Masyarakat	Sungai Melayu Baru	55	Yeyen Tumina	Masyarakat	Kemuning Biutak
26	Amansius Kidung	Kepala Desa Sungai Melayu	Sungai Melayu	56	Ana Aqueenta	BPD Desa Kemuning	Kemuning Biutak
27	Sukur	Ketua DAD	Sungai Melayu	57	Yohes Mugan	Karua	Sungai Melayu
28	Matdul	Satpam	Sungai Melayu	58	Saipul	Karua	Sungai Melayu
29	Rudi Masla	Kades Kemuning Biutak	Kemuning Biutak	59	Adrianus Ucal	Ketua RT 06	Sungai Melayu
30	Melania Melda	Kaur Pemerintahan	Kemuning Biutak	60	Timurtus Undat	Kaur Adat	Sungai Melayu

Appendix 2: Summary of Stakeholder Consultation on HCV Assessment

Name	Job Title/Role	Organization/ Social Groups	Thing or main issues & recommendations /response assessment team
Mr. Sுகuh	Community	Sungai Melayu Village	<ul style="list-style-type: none"> • Whether the ponds or former gold mines in some areas especially the rivers of PT Hungarindo Persada can be utilized for fisheries? <p>The team response:</p> <ul style="list-style-type: none"> - The fishing using the former gold mine as a fish pond might be utilized in cooperation with company, and should pay attention to several things: the most important is analysis of water quality and environment, is suitable for fishing or not. In this case the company can do CSR program.
Yoga	KSDA staff Wil 2	BKSDA Kalimantan Barat	<ul style="list-style-type: none"> • The HCV data presented will it be the same with the HCV report and how to categorize based on conservation status or other? • Whether the study found proboscis monkey? • Based on the presentation, the area of PT HPE are heathlands, the heathlands is a unique type of forests in Kalimantan, why not categorize as potentially HCV 1, 2, and 3? <p>The team response:</p> <ul style="list-style-type: none"> - Animal data presentation will be tailored to the format of the report that is starting from the issue is global, domestic, until local. - Based on the study results, from direct observation and interviews with employees and local communities, there is no evidence of proboscis monkey. - The area that potentially HCV 3 is unique ecosystems and vulnerable areas such as the forest over limestone (<i>karst</i>), peat forests, heathland forest, and mangrove forests. But on the assessment done now, existing conditions that exist in the PT HPE is generally in the form of heavily damaged heathlands the value of biodiversity and environmental services is very low. The damage caused by the repetitive forest fires and the opening of the land.
Pak Samad	Community	Kemuning Biutak village	<ul style="list-style-type: none"> • There is a wrong river name, a river identified as Mentalap River in the map in presentation is actually Tentalan River. • What kind of river would be identified as HCV 4? <p>The team response:</p> <ul style="list-style-type: none"> - We really thank you for the correction. We will revise the name of the river in the reporting. - HCV 4 river should have well preserved water stream and riparian area, so the hidrological function will also be preserved. On the other hand, all of the rivers and he riparian area in the study area are severely degraded especially due to the mining activity. However, though it is not identified as HCV 4, the company is still obliged to protect and maintain the riparian areas to recover the hidrological functions.
Edward Tang	NGO	Yayasan Palung	<ul style="list-style-type: none"> • The company should be committed in managing HCV areas • I recommend the company to form a team consists of company's representation and the participants from the villages to monitor and manage the biodiversity section as part of the HCV management area. <p>The team response:</p> <ul style="list-style-type: none"> - The recommendations has been incorporated

Appendix 3: Public Consultation on HCV Assessment

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DAFTAR HADIR
PUBLIC CONSULTATION

Aksenta
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Nama PT: PT Hurganindo & PT Agriplus (SAGCRA)
 Lokasi: Komor Camat Sei Melayu Rawak
 Asesmen: ACV

Tanggal: 15 Agustus 2019
 Waktu: 09:00 - Selesai

No	Nama	Bagian/Jabatan	Alamat dan Nomor Kontak	Tanda Tangan
1	Nur Indah Ristiana	Aksenta	Jakarta 1685316756808	
2	A. J. S. Gidit	Ka. DAT	Di 9 Aker Manki g. Rawak	
3	U. B. C. H.	Ka. DAT	Kec. M.H.S	
4	A. Asjal	Ka. U. dan	Desa Sei Melayu	
5	Joseph Suciak	Kec. BPD	Desa Sei Melayu	
6	Santak	Kadus	Desa Kemuning Bukit	
7	A. Tono	LPM	Sungai Melayu	
8	SUNEKU. M	ANGGUTA DAD	KEMUNING. Kec. M.H.S	
9	A. Kidang	Feder. S. Melayu	Sungai Melayu	
10	DAHLAS	KADES BELABAN		
11	SUYAOL. Am.	Ka. PMA	Sungai Melayu	
12	L. Robert	Sel. cam. I. Melayu	16. Titi	

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DAFTAR HADIR
PUBLIC CONSULTATION

Aksenta
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No	Nama	Bagian/Jabatan	Alamat dan Nomor Kontak	Tanda Tangan
13	N. Fekur	Kec. DAT SMD	Sei, Kel.	
14	Suwan Salwara	Kadus Kemuning Bukit	Desa Kemuning Bukit	
15	Singhar	Kec. BPD	Desa Kemuning Bukit	
16	Valentini Ajial	Kadus Kemuning Bukit	Sungai Melayu	
17	Y. SAPARUDIN	Kadus Kemuning Bukit	Desa Kemuning Bukit	
18	Helo	Kantor Camat M.H.S	Ketapang	
19	G. Kicadul	LPM	Sungai Melayu	
20	ASAMU	Kel. U.	Kelapang	
21	Eduardo Hurgan	Perkim IH	Ketapang	
22	Hafiz Koro-Koro	AC. KRAS	Kelapang	
23	Beawan Setjati	Partnership Bag 4	Kelapang	
24	ALIAK	HUNDAK	PT HP	
25	Yakhanarata S	EM. BKRE	Belaban	
26	HEMAY. A. e	Siap PAD	marau	
27	Syamsudin	Ketum. Kop. KKS	Belaban	
28	Polan Hurnan.P	PKL PT-HP	PT-HP	

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