Jakarta, October 30, 2017

Public Summary of
High Conservation Value Assessment

PT Hungarindo Persada

Ketapang Regency
Kalimantan Barat Province

Aksénta
accentuate life

Report title	Public Summary of High Conservation Value Assessment, PT Hungarindo Persada, Ketapang Regency, Kalimantan Barat Province , Indonesia
Date of report	October 30, 2017
Lead Assessor	Nandang Mulyana
ALS Licence	Provisionally Licensed Assessor (ALS15037NM)
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HCV assessment team	Adhy Widya Setiawan, Zakaria Al-anshary, Fersely Getsemani Feliggi Salmon, Aulia Bahadhori Mukti, Noor Rakhmat Danumiharja, Ali Akbar Hutzi, Nurindah Ristiana
Organization commissioning HCV assessment	PT Hungarindo Persada Jln. Agus Salim Gg. Cucak Rowo RT 16 RW 08 Kel. Sampit, Kec. Delta Pawan Ketapang Regency, Kalimantan Barat Province
Location of assessment	Kemuning Biutak Village (Matan Hilir Selatan District), and Sungai Melayu Village, (Sungai Melayu Rayak District), Ketapang Regency Kalimantan Barat Province Indonesia
Assessment period	• Pre-assessment 05th July – 02nd August 2017 • Assessment HCV 04th-16th August 2017
Size area of assessment	Total area 3,700 ha (Location Permit/*Izin Lokasi*)
HCVMA allocation area	290.35 hektare
Land use plan	Oil palm plantation
Certification scheme	RSPO (under Bumitama Agri, Ltd.)
ALS tier rating	Tier 1

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1. Introduction and Background

Developments and environmental issues are related to sustainable development. Sustainable development requires good management of environmental and social aspects. In this context, PT Hungarindo Persada (PT HPD) conducts HCV assessment to identify areas with high conservation value in the location permit (*Izin Lokasi*) of PT HPD. The assessment was conducted from July – October 2017, consisting of pre-assessment from 05 July – 02 August 2017, and field assessment conducted from 04 – 16 August 2017.

In this HCV assessment, key references used are: (i) Common Guidance for the Identification of High Conservation Values (Brown *et.al.*, 2013, amended in September 2017); (ii) Common Guidance for the Management and Monitoring of High Conservation Values (HCVRN, 2014); (iii) HCV Assessment Manual (HCVRN, 2014); (iv) HCV Assessment Report Template (HCVRN, 2013); (v) Template for Public Summaries of HCV Assessment Reports (HCVRN, 2014); and the Indonesian HCV Toolkit (Consortium to Revise the HCV Toolkit for Indonesia, 2008), which was used mainly to analyze HCV 3 areas based on land systems, as referred to by Brown *et al.* (2013, amended in September 2017).

This HCV assessment was conducted in undeveloped area of palm oil plantation, and the study area is next to the developed area of other companies. Majority of the land cover are shrubs, which previously was cleared by the community and burnt area that undergo natural succession. Currently PT HPD has not conducted any land clearing activities and planting in this concession. Current activities are dissemination of information (socialization) and land acquisition. Since obtaining location permit (*Izin Lokasi*), PT HPD has conducted dissemination of information (socialization) and land acquisition, and conduct CSR activities in Kemuning Biutak village. As per end of July 2017, PT HPD had acquired lands for own plantation (inti) 2,505.45 ha, and 2017 385.30 ha, which are located in Sungai Melayu village 1,757.11 ha, and in Kemuning Biutak village 748.34 ha.
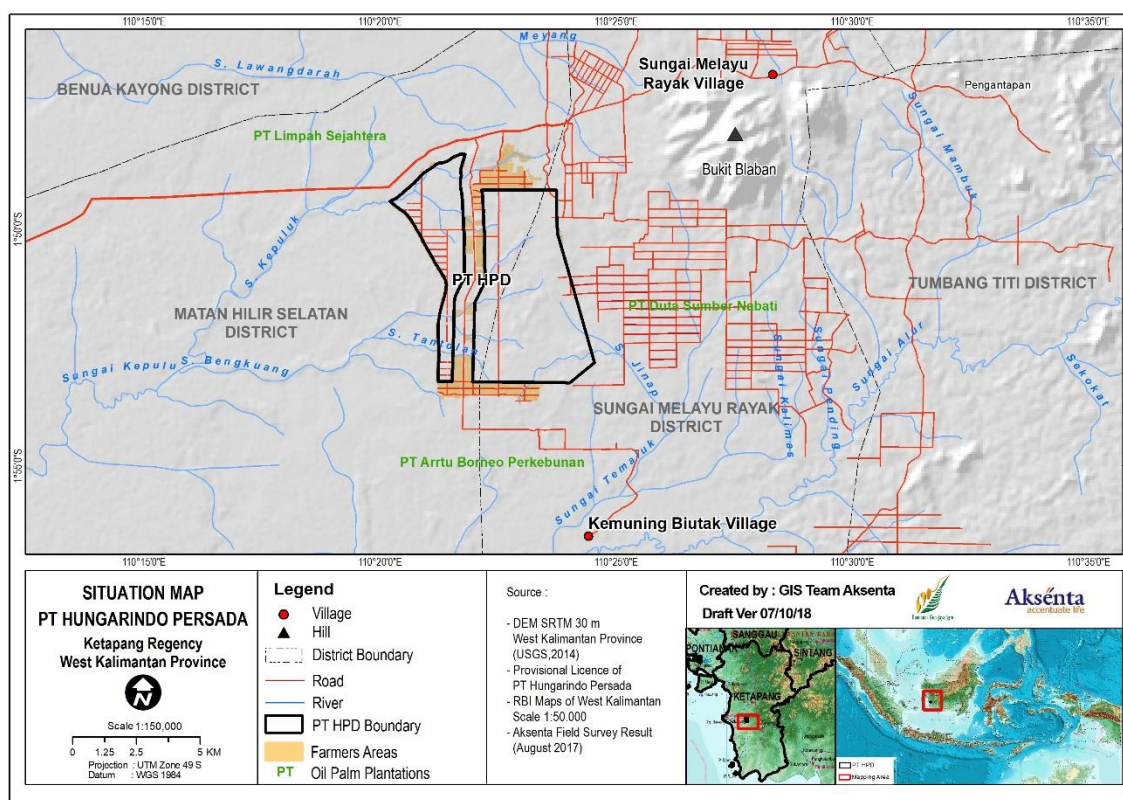
Below are the information related to PT HPD as the company that ask for and finance the assessment:

Name of Company	:	PT Hungarindo Persada (PT HPD)
Line of Business and Activity	:	Oil Palm Plantation
RSPO Membership	:	Member RSPO, under Bumitama Agri, Ltd.
Contact Person	:	Hidayat Aprilianto
		Head of Sustainability
Office Address	:	Jln. Agus Salim Gg. Cucak Rowo RT 16 RW 08
		Sampit, Delta Pawan
		Ketapang Regency, Kalimantan Barat Province

The Provisional License (Location Permit; *Izin Lokasi*) of PT HPD consists of 2 areas with total area ±3,700 ha. The two areas are divided by road. Administratively, the study area is located in the Sungai Melayu Village, Sungai Melayu Rayak District, and Kemuning Biutak Village, Matan Hilir Selatan District, Ketapang Regency, Kalimantan Barat Province. The study area is located in 1°48'524,3"-1°53'14,6" LS, 110°20'12,1"-110° 24'32,2" BT, and also located in the Pesaguan watershed (*Daerah Aliran Sungai*).

The study area is surrounded by palm oil plantations and production forest (Hutan Produksi). The border of the study area in north, east and south side are palm oil plantations managed by companies (PT Limpah Sejahtera, PT Duta Sumber Nabati, and PT Arrtu Borneo Perkebunan) and community or community groups. In the west side borders with production forest (Hutan Produksi). The study area is about 50 km from the capital of Ketapang regency, and can be

reached by land by about 2.5 hours. Generally the road has been improved with asphalt and only in some area, the road are in bad condition (**Figure 1**).

Note: the exact positions of the surrounding companies are only roughly mapped because shapefiles of the boundaries of these companies were not available

Figure 1. The Study Area and Surrounding Areas

With total area of 3,700 ha, the study area has the operational scale as medium. While according to operational intensity, the area is categorized as "zero intensity". These scales are due to the non existence of natural ecosystem or natural habitat in the study area, therefore there will not be conversion for these areas. In the study area, there is no area with natural or forest land cover. The land covers at the time of assessment were (i) old shrubs (0.5%), (ii) young shrubs (9.5%), (iii) bushes (58.9%), (iv) open land (20.8%), and (v) oil palm (10.2%). Therefore the potential impact of the plantation operation in the area is categorized as having small potential impact.

Table 1. Scoring Matrix of Potential Impact

Scoring Matrix of Potential Impact					
		Intensity			
		Zero	Low	Medium	High
Scale	Small				
	Medium	x			
	Large				

Note:

x	: Potential impact in the study area
	: Not Significantly Impacting
	: Having Small Potential Impact
	: Having Moderate Potential Impact
	: Potentially Severely Impacting

This HCV assessment was conducted by 8 experts from Aksenta (PT Gagas Dinamiga Aksenta). Details of the assessment team below **Table 2.**

Table 2. HCV Assessment Team

Name	ALS Licence	Institution	Role
Nandang Mulyana nandang@aksenta.com	Provisional ALS15037NM	Team leader, socio-cultural assessment (HCV 5 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 F. 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. Methods

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 include 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.

2.1. 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, RePPProt, 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.

2.2. 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 physiographical region where it occurs.
2. An ecosystem that will lose 75% or more of its original extent in the bio physiographical 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 physiographical 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.

2.2.1. 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.

2.2.2. 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 3 . 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

Stakeholders	Consulting approach
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

2.3. Data Analysis and HCV Area Mapping

All coordinates of the area which have elements or attributes of HCV were mapped (**Figure 2**). 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 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.
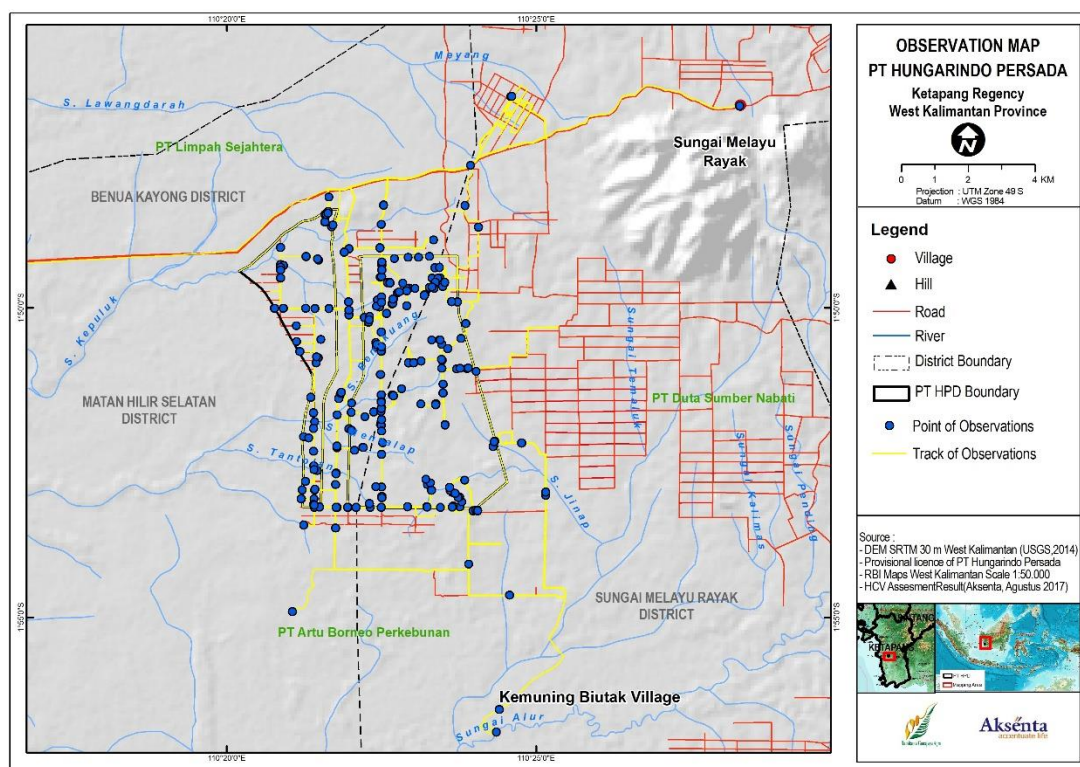
Figure 2 . The observation point and survey location in the study area

2.4.   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 4**

Table 4. HCV Assessment Schedule for PT Hungarindo Persada

Stages	Purpose	Activities	Schedule
PRE-FIELD SURVEY			
Pre-assessment and preparation	• 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	• Gather preliminary data and information from the company about the status of the development and management of unit • Gather preliminary data and information from secondary sources (reports, journals, books, statistical data, basic maps) and resource persons • Perform data analysis and spatial analysis	05 July-02 August 2017
		• Scooping Study/Field surveys pre-assessment	20-22 July 2017
FIELD SURVEY			

Stages	Purpose	Activities	Schedule
Opening meeting	• 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	• 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
Participatory mapping	• 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	• Verify the existence of attributes or elements of HCV • Identify HCV areas and indicative borders • Identify threats and potential threats to HCV	• Check land cover in the field • Field data collection through interviews with triangulation	04-16 August 2017
Stakeholders consultation	• 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
Closing of the meeting	Delivering results of HCV identification to the management unit	• 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	• Data analysis • Spatial analysis • Report writing • Report finalization	20 August- 24 October 2017

3. Results and Justification

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 (*Nephentes 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:

1. **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).

2. **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*.

3. **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.

4. **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.

3.2. 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 (see **Figure 4**).
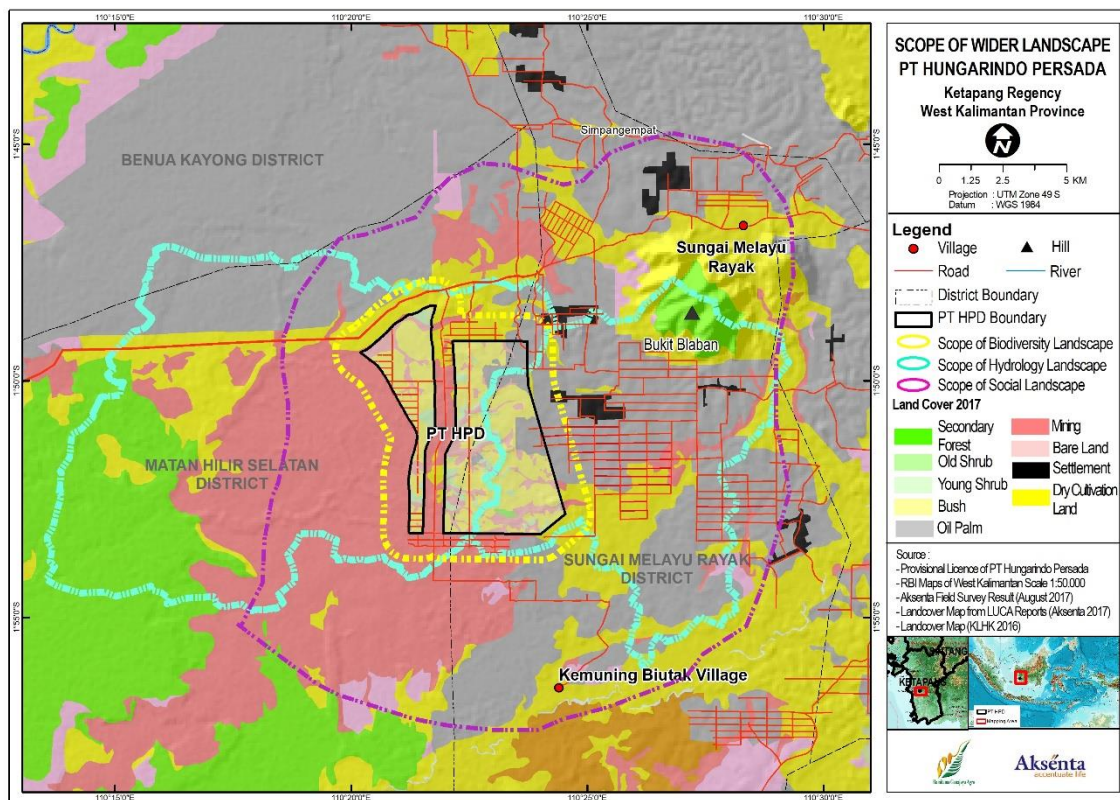
Figure 4 . The boundaries of the study on the wider landscape

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 (**Figure 5**).

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).
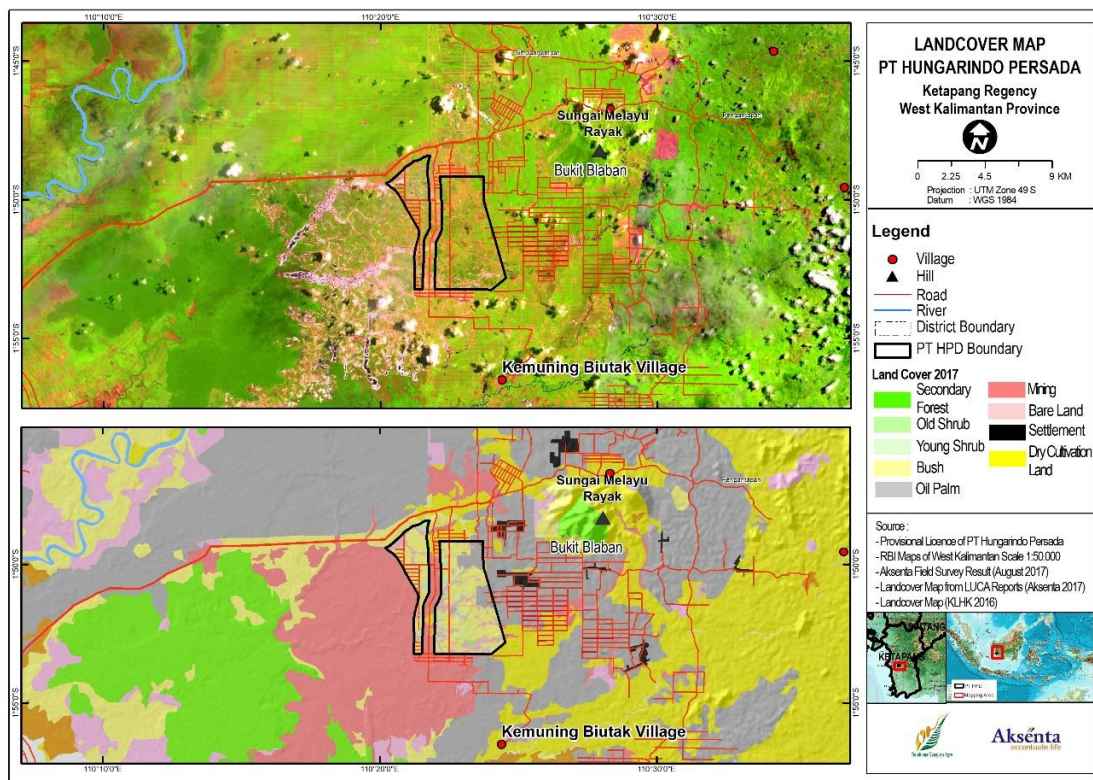
Figure 5. Land Cover map in the study area

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 International[1], 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.

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[1] [1] http://www.wetlands.or.id/wdb/siteinfo.php?SITE_COD=KAL07

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% (**Figure 7**). 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.
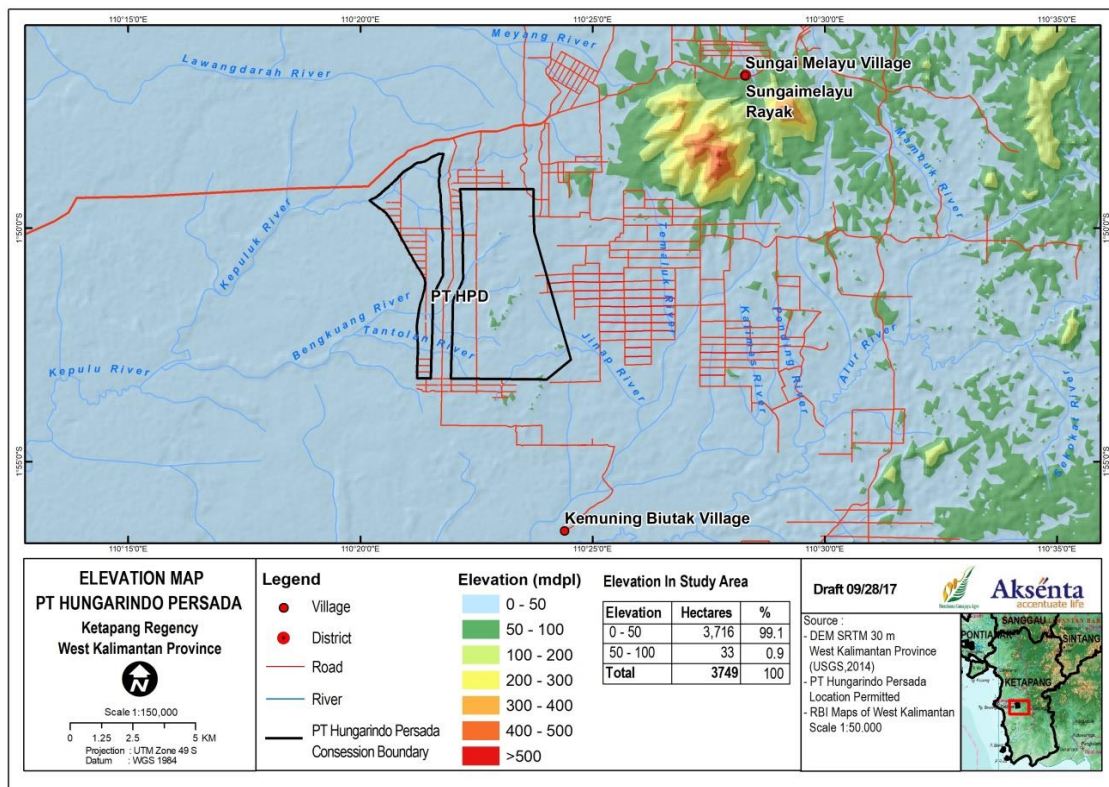

Figure 6 . The topography in the study area and its surroundings

The type of soil in the area of study is composed of three land Association (RePPProT, 1989), namely: (i) *placaquods* and *tropopsamments*; (ii) *tropohemists* and *tropaquents*; and (iii) *tropodults, paleudults,* and *tropaquepts* (**Figure 8**). The soil Association is *placaquods* and *tropopsamments* is a sandy soil dominates (78%) of the study area. The soil Association *tropohemists* 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.
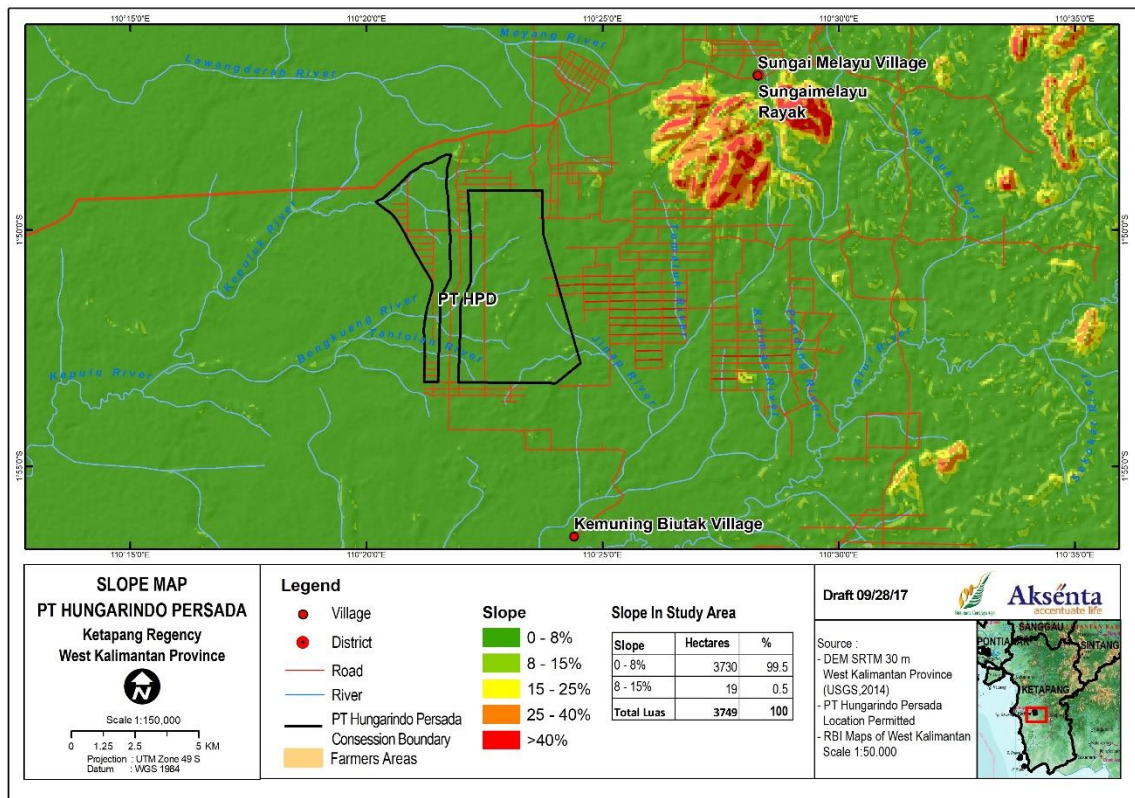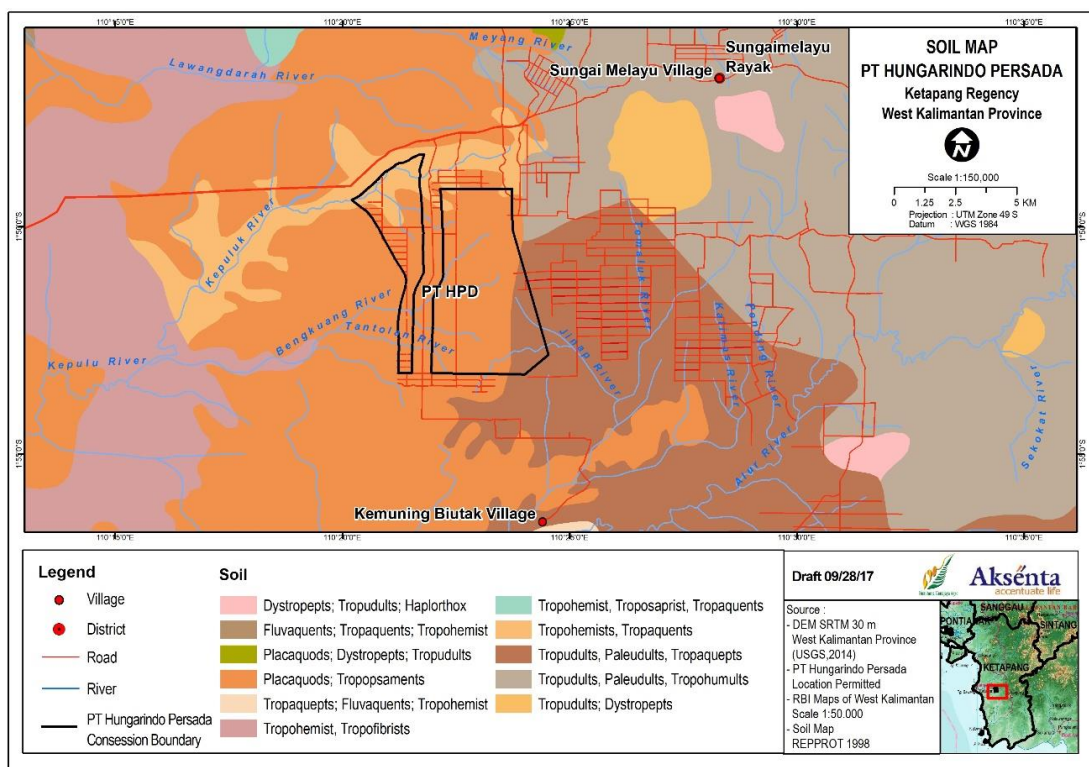
Figure 7. Slopes in the study area and its surrounding

Gambar 8. Soil types on the study area and its surrounding

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 5**).

Table 5. Villages and Population in the Study Area

No.	Village	District	Area (Km²)	Population Number	Population Household	Density (Number/Km²)
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)

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 6**).

Table 6. Socio-economic and cultural villages in the area of study

	The fulfillment of the basic needs of the community	
	Kemuning Biutak	**Sungai Melayu**
Livelihood	• 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	• 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	• The way the estate with road conditions laterit, but still there are accessible throughout the season (year), with either two-wheel vehicles or four wheel. • 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.	• 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	• 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 *Poskesdes* Helpers with Nurse Midwives and health workers.	• 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 Auxiliary health worker with Poskesdes doctors, midwives and Nurses

	The fulfillment of the basic needs of the community	
	Kemuning Biutak	**Sungai Melayu**
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),	• 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	• 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 7**). 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.

Table 7. Ethnic and Religious Composition of the Villages in the Study Area

Village	Sub	Ethnic	Religion
Sungai Melayu	Sungai Melayu Rayak	The native Dayak tribes: Pesaguan Others: Java, Chinese, Bugis and Minangkabau	Roman Catholic (80%), Protestant (12%), Muslim (8%)
Kemuning Biutak	Matan Hilir Selatan	Dayak Kendawangan Expat tribe: Java, Chinese, Bugis and Minangkabau	Catholic (85%), Protestant (10%), Islam (5%)

Source: Sungai Melayu District and Matan Hilir Selatan District in Figure 2016; (BPS, Ketapang Regency 2016), and the results of interview Aksenta (2017)

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 8**.

Table 8. Summary Description and Presence of HCVs in Study Area

HCV	The definition of the	Summary Description and Justification		
		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 *(rare, threatened or endangered species)*, 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 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.	-	-	• The ethnicity and culture of the communities is very 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

3.6.1. HCV 1

Several conditions presented in **Table 9** 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 9. 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 • 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 Adjudant (*Leptoptilos javanicus* -Vulnerable) which was encountered in a ponds in the riparian buffer area of Sungai Kepuluk. The Lesser Adjudant 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 10**). The

total size of the HCVMA area is 290.35 ha, and the locations of HCV 1 areas are presented in **Figure 9**.

Table 10 . 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
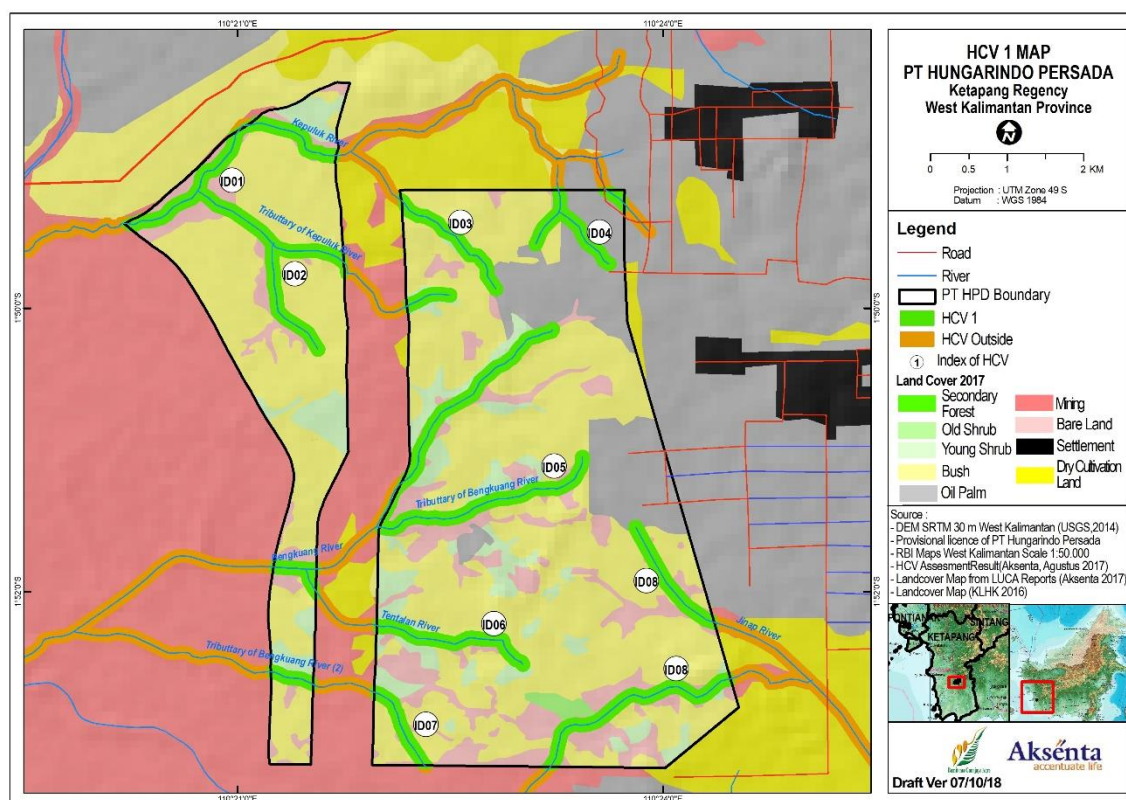

Figure 9 . Map of Indicative HCV 1 areas in location permit of PT HPD

3.6.2. HCV 2

 Conditions as presented in Table 11 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 11 . 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.

3.6.3. 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 12** presents situations for detecting the presence of HCVA 3 (Brown *et al.*, 2017). According to this assessment output, no areas in the study area qualify as HCVA 3.

Table 12. 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 13**, **Figure 10**). This remaining dipterocarp vegetation will be able to restore itself through natural succession.

Table 13 . 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**
% 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*
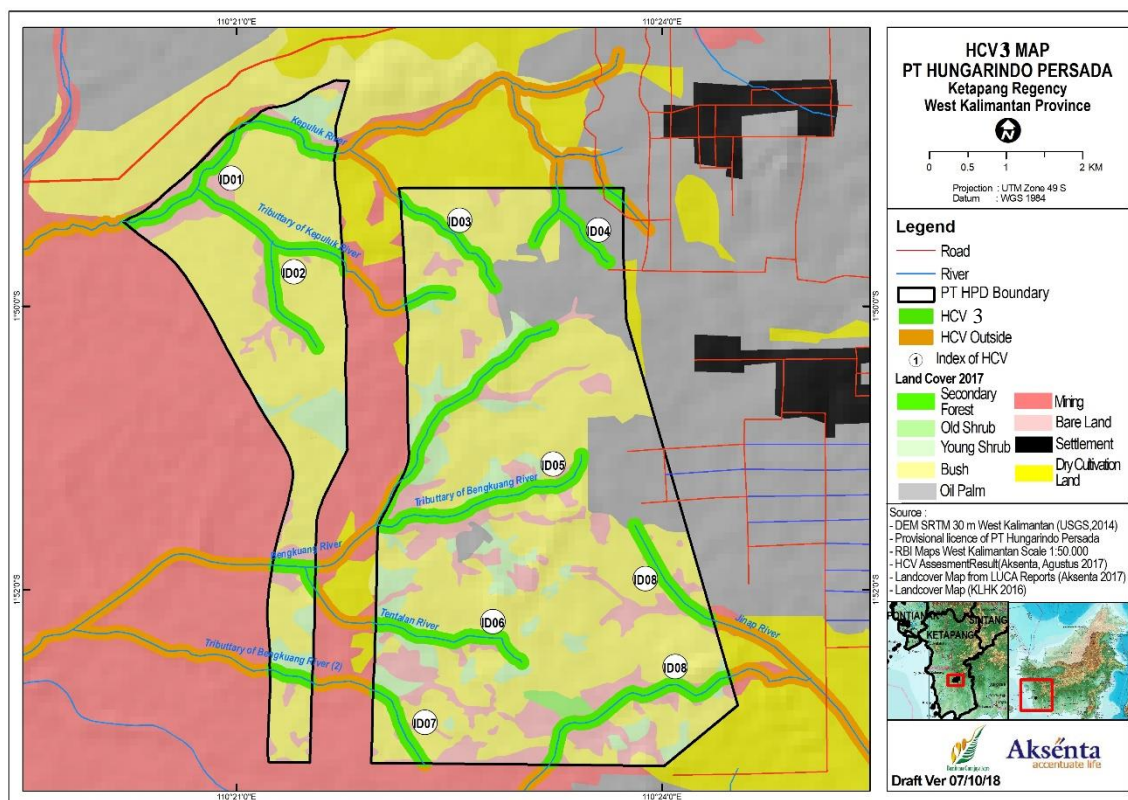
Figure 10 . Map of Indicative HCV 3 areas in location permit of PT HPD

3.6.4. 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 14**.

Table 14. 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.	-
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

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 15**). 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 **Figure 11**.

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 of the rivers are also in accordance with the applicable laws and regulations.

Table 15 . 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

Index	Name of Location	HCV (ha)	HCVMA (ha)
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
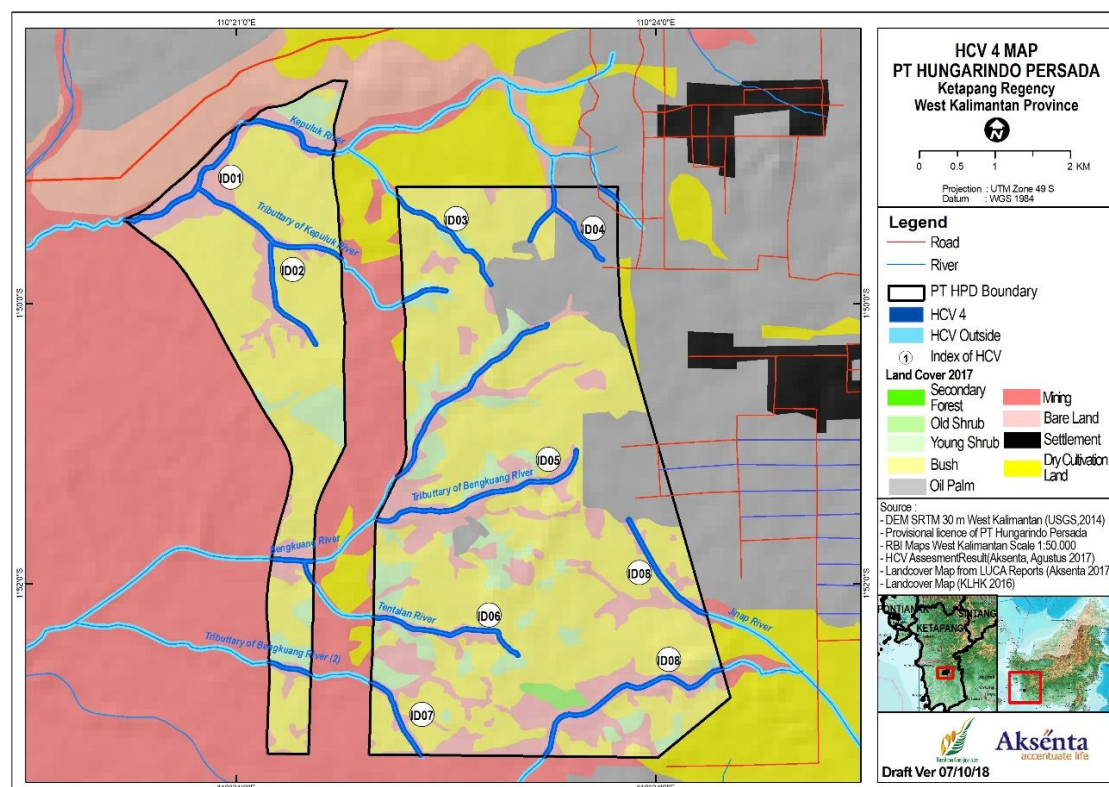

Figure 11. Map of HCV 4 areas in the license area of PT Hungarindo Persada

3.6.5. 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 16**), as described in the Common Guidance for HCV Identification (Brown *et al.*, 2017).

Table 16. 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	-

Qualify as HCV 5	Present/Absent
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 6**)

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:

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.

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.

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.

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.

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.

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.

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.

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.

3.6.6. 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 17**).

Table 17. 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:

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

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.

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.

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

community 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.

<u>Plant or animal resources with totemic values or used in traditional ceremonies.</u>

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 natives in the Sungai Melayu village is the Dayak Pesaguan, in Kemuning Biutak is Dayak Kendawangan that has been mixed with others (**Table 18**). 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 18. The ethnic and religious composition of the villages in the study area

Village	District	Ethnic	Religion
Sungai Melayu	Sungai Melayu Rayak	The native Dayak tribe: Pesaguan Others: Java, Chinese, Bugis and Minangkabau	Catholic (80%), Protestant (12%), Islam (8%)
Kemuning Biutak	Matan Hilir Selatan	The native Dayak tribe: Kendawangan Others: Java, Chinese, Bugis and Minangkabau	Catholic (85%), Protestant (10%), Islam (5%)

Source: *Kecamatan Sungai Melayu dan Kecamatan Matan Hilir Selatan Dalam Angka, 2016 (BPS, Kabupaten Ketapang), and interview results Aksenta (2017)*

3.7. Stakeholder Consultation

Stakeholders consultation is conducted through informal meetings or formal meetings, on all stages of studies, ranging from preparation/pre-assessment, field study, and in the process of report drafting. The consultation was carried out with in-depth interviews, participatory mapping, discussions and field visits.

Stakeholders consultation through formal meetings was conducted through public consultation to present the interim results of the study to stakeholders. Formal consultation conducted with presentation and discussion. Summary of the stakeholders consultation in **Table 19**.

Table 19. Summary of Stakeholder consultation

Name	Job Title/Role	Organization/ Social Groups	Thing or main issues & recommendations /response assessment team
Mr. Sukuh	Community	Sungai Melayu Village	• Whether the ponds or former gold mines in some areas especially the rivers of PT Hungarindo Persada can be utilized for fisheries? The team response: - 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	• 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 HPD are heathlands, the heathlands is a unique type of forests in Kalimantan, why not categorize as potentially HCV 1, 2, and 3?

Name	Job Title/Role	Organization/ Social Groups	Thing or main issues & recommendations /response assessment team
			The team response: - 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 (*karst*), peat forests, heathland forest, and mangrove forests. But on the assessment done now, existing conditions that exist in the PT HPD 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	• 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? The team response: • 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	• 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. The team response: The recommendations has been incorporated

• *During the Stakeholder Consultation, the Indicative HCV map was presented for confirmation, verification and discussion*
• *The Stakeholder Consultation was not undertaken to present the final results.*
• *Input from stakeholders have been incorporated in the management and monitoring recommendations in this report*

4. Management and Monitoring of HCV

4.1. HCV Management Area (HCVMA)

HCV management area, or HCVMA, are identical for HCV 1, HCV 3 and HCV 4, namely the rivers and their riparian buffers in the study area. While for HCV 4, the HCVMA also includes the riparian buffers of rivers, although area the HCV 4 only addresses the river.

The width of the riparian that need to be managed is 50 m (right-left). The width is sufficient to support and conserve the HCV area. HCV 1, 3 and 4, as well as HCVMA all overlap (**Figure 12**). Total area HCVMA in this study area was 290.35 ha or 7.75% of the total location permit area (Izin Lokasi) of PT HPD (**Table 20**).

Table 20. Location, area HCV and HCVMA in the area of license permit of PT HPD

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

Index	Location name	HCV Types	HCV** (ha)*	HCVMA (ha)*
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

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
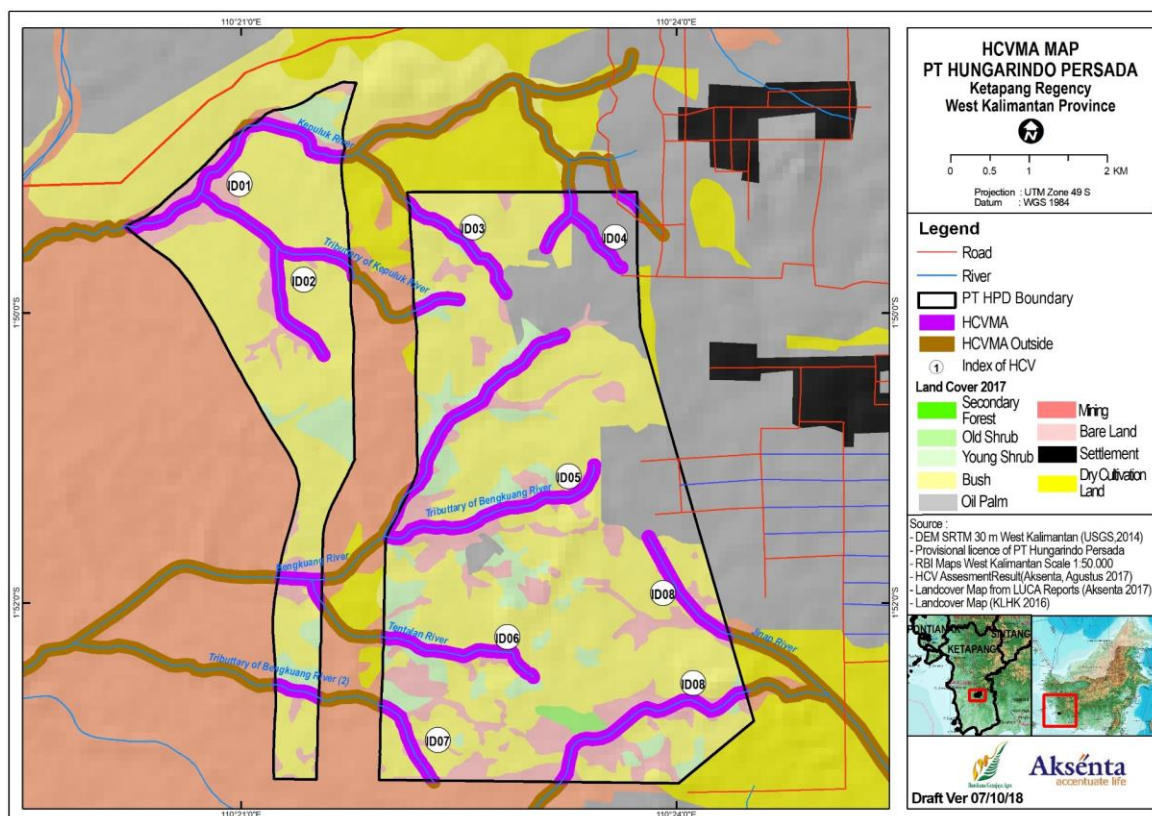
** The cumulative area of HCV 1, 3, and 4

Figure 12.   The locations of HCVMAs in and around the license area of PT HPD

4.2. Threat Assessment

Threats against HCV consisted of actual and potential threats. Based on the source, the threats on HCV can source from internal factor (management unit) or from external factors (institutional or personal community). Threat assessment aims to assist management unit in addressing the threat of the internal through a decent management, as well as improving the ability to reduce various external threats.

Most of the actual threats identified come from external factors. The biggest threat against the river comes from the illegal gold mining activity, that has been going on since 1997. In addition, land fires also occur due to external factors. As for the threat that comes from internal factors

are still potential, of which over-clearing by contractors, palm cultivation on the riparian, and application of agro-chemicals (**Tables 21**).

Table 21. A summary of the results of the HCV threat assessment in the study area

What happens now/pressure	Potential impact on value	Causes/sources (likely contribute to the pressure)	Note
HCV 1 & HCV 3			
The decline in the number of species and the number of individual species of RTE	High	The broad decline in habitat quality and wildlife	Animal temporary, solitary
Loss of land cover with woods	High	Wood utilization	Taking the wood for carpentry still found during the survey, but it is low intensity because of availability woods are little
Fires	High	Opening the land for fields	There are areas that are repeatedly burned
Wildlife hunting	Medium	Hunting activities are carried out by a small portion of the surrounding communities	There are some people who hunting deer, but cannot be confirmed their origins.
Damage and loss of aquatic habitat	High	Illegal gold mining	Illegal mining are still conducted but with decreasing intensity
HCV 4			
The decline in water quality	High	Illegal gold mining	• Mining Activity is the actual threat and found in the entire river flow • The application of agro-chemicals is a potential threat, if the planting already conducted in the riparian
	Low	Residue of fertilizer discharge, pesticides and herbicides that are carried by surface runoff	
Land conversion on the banks of the river	High	Illegal gold mining	• The mining activity has changed the natural shape of rivers, including land cover at riparian • There has not been LC operations by company, so it is still potential
	Low	Over-clearing by contractor for land clearing	
Sedimentation process of river	High	Illegal gold mining	• sands or material from the mining activity scattered in the river or riparian
Fires	Medium-High	Uncontrolled land clearing or influence the fire from outside the study area	• Large scale fires occurred in 1997/1998, 2003/2004, and 2015

4.3. HCV Management Plan and Monitoring

The management of HCV area is aimed at protecting elements and HCV area from damage, as well as maintain and enhance the value or function. It is also related with mitigation against threats, either actual or potential. HCV Management and monitoring plan can also be integrated with the implementation of an environmental management plan and an Environmental Monitoring Plan (RKL/RPL). The following are general recommendations in the management and monitoring of HCV:

1. Installation signboards with call for not burning in the area, particularly in the enclave area, including drafting and implementing Standard Operational Procedure (SOP) on handling fires.

2. Installation of signboards limiting or prohibiting the use of chemicals in riparian areas and socialization to spraying employees, as a precautionary principle, for preventing negative impact to the environment.

In the context of the region, there are also some HCV area located outside of stud area, but played important roles towards the connectivity of HCV area in the company. These areas found in five segments of rivers located between the two fields of study area.

The five river segments are outside the study area so that management unit does not have full authority to manage them. Nevertheless, taking into account the functions of connectivity, the management unit need to participate in the protection and management of the area, include:

- Identify the status of land tenure[2] in these areas and in collaboration with the owners/ managers of land for both managing the five segments.

- Establish communication and proactively cooperate with the local authorities, including with the village government, for the conservation and protection of rivers in the area

- Community empowerment programme, particularly programme for alternative income for gold miners, because the activity is the main threat against HCV area, beside fires.

- Conduct fire patrols in the area by involving village governments and other authorities, although its location is outside of the area of study. It is also associated with SOP, facilities and infrastructure, and fire emergency response team.

Table 22. Recommendations for Management and Monitoring of HCVs in the study area

Threats	Management Recommendations	Monitoring Recommendations
HCV 1 & HCV 3		
Type of plant RTE (*Shorea balangeran*) is found scattered plantlets in certain spots and the population is low in comparison with other shrub vegetation. Degraded habitats decrease the species prefers growing in the area of study.	• In order not to compete with the shrub and other invasive types, it is recommended to do a temporary transfer into the nursery and can be replanted as plants enrichment in riparian • The plant seedlings are guarded and cared for where they grow, by way of cleaning of competing weeds	• Conducted regular monitoring of growth (recording of the number, location and the addition of diameter and height • Environmentally friendly treatments against competing weeds
Loss of land cover with woods and habitat degradation	• Applying the techniques of soil and water conservation with vegetative and civil approach to based on the area and riparian/ flow • Socialization, installation of the benchmarks, signboards of HCV area • Prevention of illegal mining	Conduct patrols and coordination with local authorities and communities around PT HPD
Fires	• Performs coordination and cooperation with the community to limit community land clearing by burning not to extend plantation and HCV area • Form a team handling forest fires and land	Conduct patrols and coordination with local authorities and communities around PT HPD, especially at the height of the dry season
Wildlife hunting	• Make sure RTE species hunting does not occur by all related parties • Conduct socialization to target community • Installation of the benchmark and	• Monitor hunting activities which target RTE species • Monitor the population development of HCV species 1

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[2] Those area are through by a road to the oil palm plantation of PT Arrtu Borneo Plantation. The locals know as a "Arrtu Road". The legal status and land owner of the area should be identify so the company could make a collaboration to manage and protect the river and riparian zone.

Threats	Management Recommendations	Monitoring Recommendations
	signboards marker of HCV area	
HCV 4		
The decline in water quality	• Collaborate with communities related for alternative jobs from mining activities • Build sediment trap/gully plugs in the flow or branch of rivers • Installation of the sign boards banning the use of chemicals on the riparian and socialization to spraying employees	• Document socialization with relevant stakeholders • Check the water quality on a regular basis (minimum 6 months) in the monitoring points of water (inlet-outlet of rivers), in particular the river Kepuluk, Bengkuang, and Jinap; the examination should be done both visually as well as by acknowledged laboratory test
Land conversion in riparian	• Dissemination to the public about the existence and function of the rivers and riparian • Collaboration and cooperation with communities, government (from village level up to the regency), as well as NGOs concerned with conservation and protection of river • Socialization to employees and contractors of land clearing on the boundaries of the riparian to avoid over-clearing • Enrichment of vegetation on the degraded riparian (recommended with native tree species and/or who have a strong rooting in and, as well as leafy canopies)	• Documenting the socializing with stakeholders related • Periodically (at least once a month), monitor the boundaries of areas of riparian • Accompany contractors LC and document the process during land clearing • Monitor the growth of vegetation (% growing)
Sedimentation process of river and water body	• build sediment trap/gully plugs in the flow or branch of rivers, mainly flowing into the (river) area of HCV • Maintenance of ditches and rivers periodically by normalizing rivers (dredging)	• Measuring the rate of sedimentation in water quality monitoring locations • Monitor the physical condition of the constructions
Fires	• Form fire task force for mitigation and supported with training and tools • Socialization of fire danger and installation of fire hazard sign boards • Collaborate with communities, governments and relevant parties, to limit the use of fire for community land clearing • Carry out maintenance of areas that could potentially become artificial firebreaks, such as plantation roads or elephant trenches, including (i) reducing the availability of fuel around these areas, such as stackings, dry leaves, twigs, or wood, (ii) the road design is made somewhat convex so that a drainage channel is formed on the right and left of	• Record number of fire incidents that come with documentation and news events • Coordinate with the government, local and regional levels, for the fire mitigation • Perform regular patrol at dry season, during the months of June-October • Monitoring the maintenance of firebreak areas every 2 weeks • Monitor water discharge in water source locations for handling land fires • Reporting related to FDRS

Threats	Management Recommendations	Monitoring Recommendations
	the road. Maintenance of plantation roads can also support the accessibility of fire emergency response teams or land fire patrol teams. • Map the locations of water sources for handling land fires. Ex-mining ponds can be an alternative source of water for fire emergency response teams • Implement fire information systems, including early warning systems based on drought index or based on fire monitoring from towers, as well as potential fire events or Fire Danger Rating System (FDRS).	

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Statement of Responsibility

On behalf of PT Hungarindo Persada, we have accepted the HCV assessment and will implement the guidelines (management and monitoring) provided in the report.

Date   : Jakarta, October 30, 2017

Name   : Hidayat Aprilianto

Function : Head of Sustainibility of PT HPD

PT Gagas Dinamiga Aksenta confirms that it has written the attached report and is responsible for the findings and recommendations.

Date   : October 30, 2017

Name   : Nandang Mulyana

Function : Social expert, PT Gagas Dinamiga Aksenta

License   : HCVRN-ALS Provisionally Licensed Assessor (ALS15037NM)