

# **Summary of Assessment Reports and Management Plans for NPP**

PT Putra Bongan Jaya

West Kutai District,  
East Kalimantan Province,  
Indonesia

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# 1. Overview and Background

## 1.1. General Information of the Management Unit

Company Name	: PT Putra Bongan Jaya (PBJ)
Office Address	: Muara Gusik Village, Bongan Sub-District, West Kutai District, East Kalimantan Province
Investment Status	: Foreign Investment (PMA)
Parent Company	: Kuala Lumpur Kepong Holdings, Sdn. Bhd. (KLK Group) <sup>1</sup>
RSPO Member ID	: 1-0014-04-000-00
Date of Joining RSPO	: 18 October 2004
Contact Person	: Stephen Tiong (e-mail: <a href="mailto:mi.tiong@klk.com.my">mi.tiong@klk.com.my</a> )

KLK Group has been operational in Indonesia since 1994, starting from Belitung Island, Riau, North Sumatera and, since 2006, also Kalimantan Island.<sup>2</sup> In 2019, KLK Group proportion in Indonesia accounted for about 51% of the total area of 213,000 ha, dominated (95%) by oil palm plantation and the rest (5%) is rubber plantations. The oil palm plantation areas that KLK Group manages in Kalimantan are located in Central and East Kalimantan Provinces.

PT Putra Bongan Jaya (hereinafter referred to as “**PT PBJ**”) is a legal entity domiciled in West Kutai District, East Province, duly established as per Deed No. 28 dated 30 August 2005. Initially, shares in the company were controlled by REA Holdings, Plc. but on 20 September 2018 the majority of the shares were acquired by KLK Group. Prior to the acquisition, PT PBJ was a subsidiary to REA Holding Plc. which is also an RSPO member. As an RSPO member, no complaint nor campaign has been filed against PT PBJ by any stakeholder. When serving as a subsidiary to REA Holding Plc., PT PBJ already carried out HCV assessment in 2009 led by Wulffraat (WWF) where HCV areas remained unmapped.

The company already holds a Right to Cultivation (“**HGU**”) concession managed under PT PBJ Management Unit (“**MU**”). This concession is as per National Land Agency Head Decree No. 38/2009, the issuance of which indicates that the entire length of land acquisition process that the company has carried out already complies with the applicable laws and regulations.<sup>3</sup> See **Table 22** in **Sub-Section 3.1** for information on history of the history of legality concerning the company’s lands and operations.

The PT PBJ management unit consists of several areas according to their legal status, including HGU concession (11,602.33 ha), new location permit (4,460 ha) and the remaining is plasma area (see **Sub-Section 1.2**). The total area of the PT PBJ operational area is 19,689.53 ha (GIS acreage 19,686.2 ha)<sup>4</sup>. However, the scope area of the NPP Stage 1 in this document covers only the HGU concession area, i.e. 11,602.33 ha (GIS acreage 11,618.2 ha). This takes into account the new Ministry of Agriculture Decree No. 5/2019 (the Articles 8 and 9) stating that the Plantation Business License will be granted to a company after the company obtains the HGU concession. New planting of oil palm can only be done in areas that have a business license. Meanwhile, the coverage of the HCV study is for the entire area. As a result, differences in NPP coverage and HCV study coverage cannot be avoided.

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<sup>1</sup> <http://www.klk.com.my/>

<sup>2</sup> <https://www.klk.com.my/history-milestones/#toggle-id-6>

<sup>3</sup> National Land Agency Head Regulation No. 3/1990.

<sup>4</sup> Area based on legal document (HGU), cadastral map summary and location permit. However, based in GIS measurement, the area is 19,686.2 ha.

The scope area of HCV-HCSA assessment covers the whole management area of PT PBJ (GIS acreage 19,686.2 ha), while the scope of this NPP Document covers only the HGU concession (GIS acreage 11,618.2 ha). This difference results in the differences between total conservation area (HCV-HCS) as well as planted area reported in this document and those reported by the previous documents of studies. Out of the total management area, oil palm area cover 10,289 ha (of which 8,776.1 ha is inside the HGU); HCV-HCS area cover 6,213.0 ha (of which 2,069 ha is inside the HGU); and the rest is land bank for oil palm plantation (area based on Geographic Information System/“GIS”). Not all of the remaining areas will be cleared for oil palm plantations as this plan depends on plantation spatial plan based on HCV-HCS assessment.

Within the HGU concession, the net total conservation area is 2,069.0 ha<sup>5</sup> constituting the combination of HCVMA (1,920 ha), HCS area (1,103.7 ha) and community lands (295.9 ha). Peatland conservation is not found in the management unit. To some extent, HCS areas are in overlap with HCV areas and community lands. The HCVs identified were HCV 1, HCV 3, HCV 4, HCV 5, and HCV 6; while HCV 2 was not found in the PT PBJ management unit. The primary forest was not found within the management unit, while total area of secondary forest cover 3,761.3 ha in the management unit, 1,103.7 ha of which is located within HGU concession.

## 1.2. Description of Location

PT PBJ plantation area is located in Pulau Lanting Village of Jempang Sub-District; as well as Muara Kedang, Jambuk and Muara Gusik Villages of Bongan Sub-District, West Kutai, East Kalimantan Province, Indonesia (**Figure 1**). It is located at 116°13'7.34"-116°23'49.52"E 0°30'14.42"-0°48'20,44"S. Its operational area boundaries are as follow.

North : Lake Jempang, Lake Melintang and River Mahakam.

East : PT Jaya Mandiri Sukses oil palm plantation.

South : A production forest area managed under Forestry Business Permit (HPH) of PT ITCI, and Meratus Mountains Protection Forest.

West : Oil palm plantations of PT Gelora Mahapala and PT Farinda Bersaudara.

The area in which the company runs its operation and management is divided into four: (i) HGU concession (11,602.33 ha)<sup>6</sup>; (ii) location permit concession (4,460 ha)<sup>7</sup>; (iii) Muara Kedang Village plasma plantation area (2,836 ha); and (iv) area planned for Muara Gusik Village plasma plantation (791.2 ha). The scope area of the NPP Stage 1 is only the HGU concession area (GIS acreage 11,618.2 ha). See **Figure 2** for the area location of PT PBJ Management Unit and its surroundings.

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<sup>5</sup> Overall in the PT PBJ management unit, total conservation area in nett is 6,213.0 ha; total HCVMA is 5,549.0 ha; total HCS area is 3,750.0 ha; and total community lands is 458.8 ha.

<sup>6</sup> National Land Agency Head Decree No. 38-HGU-BPN RI-2009 on Issuance of HGU to PT Putra Bongan Jaya over Land in West Kutai District, East Kalimantan.

<sup>7</sup> Decree of Head of West Kutai Investation and One-Roof Integrated Service Office No. 525.29/K.64/2017 on Issuance of Location Permit to PT Putra Bongan Jaya for Oil Palm Plantation Development in Bukit Harapan, Jambuk Makmur, Jambuk and Muara Gusiq Villages of Bongan Sub-District, West Kutai, East Kalimantan.



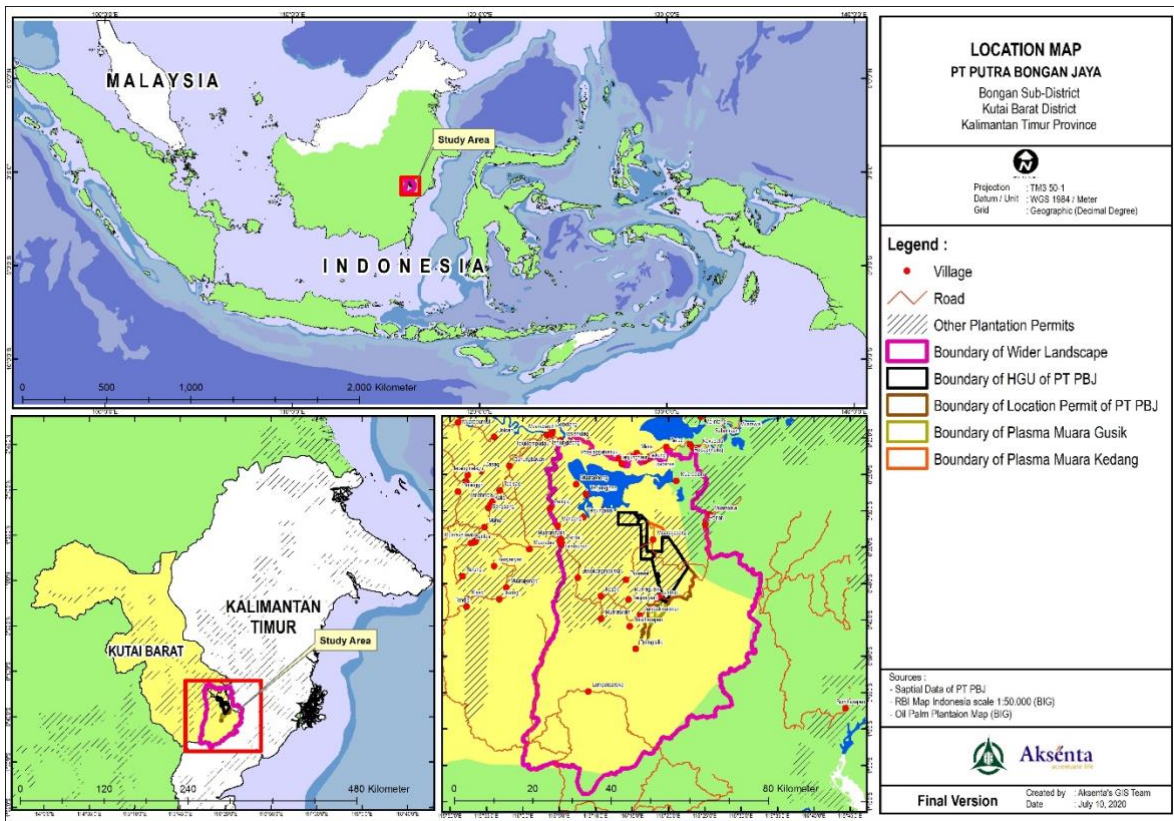


Figure 1. Map of PT PBJ MU location

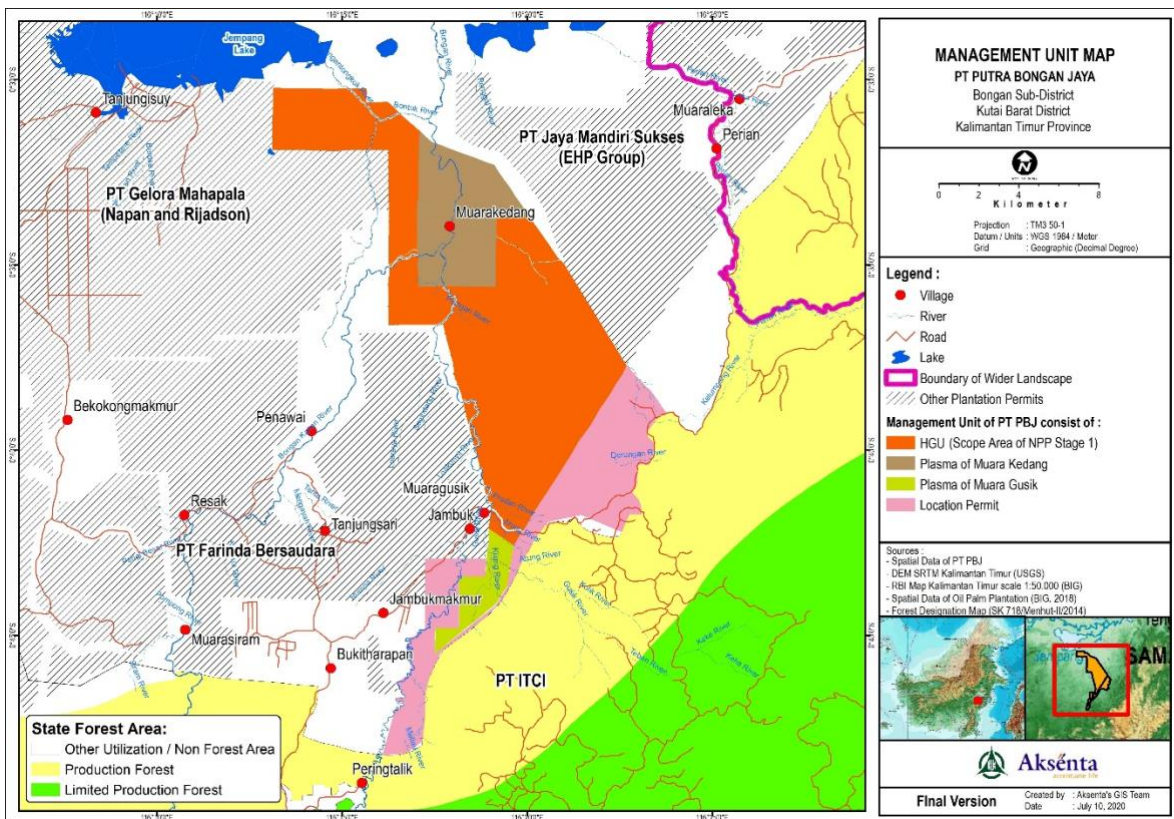
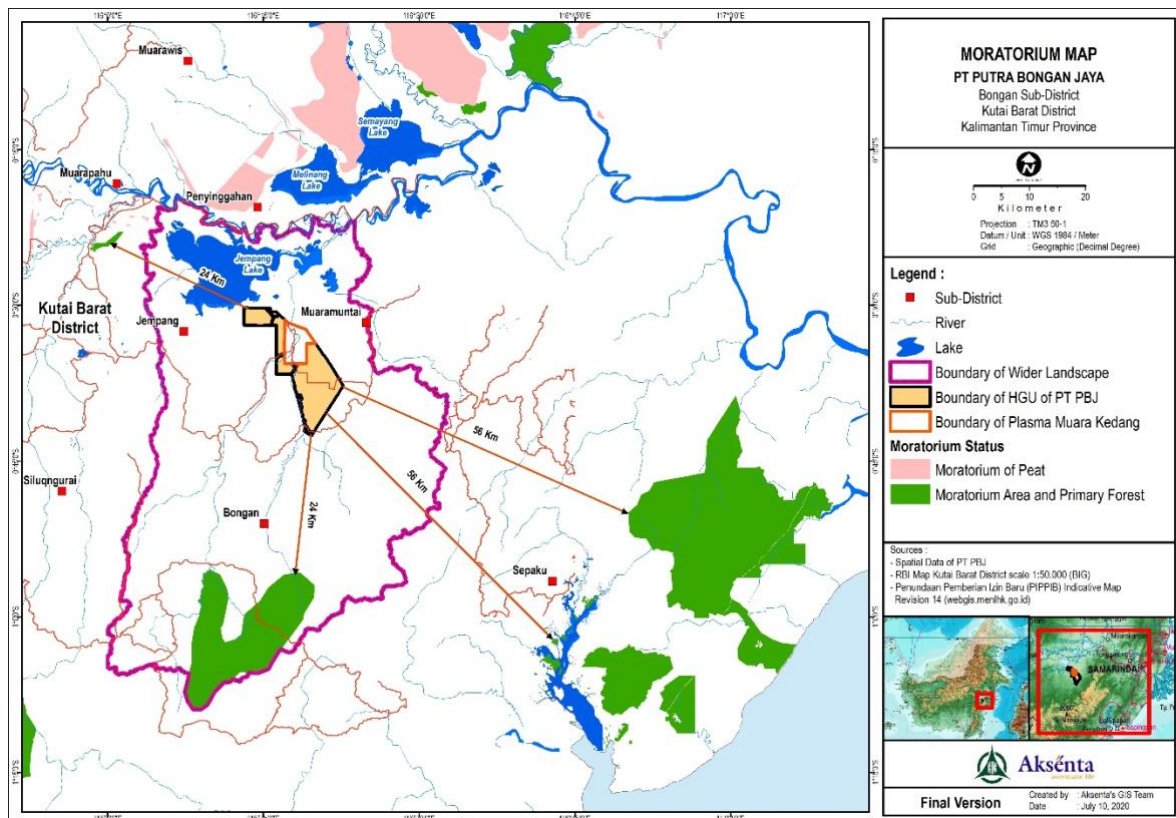


Figure 2. Situation map of PT PBJ MU and its surroundings

## National and regional contexts

Based on East Kalimantan Provincial Spatial Plan 2016-2036, it is known that plantation sector development (agricultural use) is assigned the largest area among other agricultural sectors in the province. Its percentage for the future use is planned up to 89% of the total agricultural area in the province. In the wider context, the allocation for plantation development plan makes up 31% of the entire area of agricultural spatial plan in East Kalimantan.

The oil palm plantation business operational activities are in line with East Kalimantan 2016-2036 Provincial Spatial Plan, where the management unit is situated in a zone allocated for plantation areas. Based on Indicative Map of New Permit Granting Moratorium (PIPIB Map) v.14, PT PBJ operational area is outside areas that the Government has designated as primary forests and/or peatlands.<sup>8</sup> The nearest moratorium area is 24 km away to the south (**Figure 3**), while the nearest conservation area is 56 km southeast, which is outside the wider landscape (**Figure 4**). The company's operational area is entirely within the Non-Forestry Zone (APL; **Figure 4**). In addition, the company operation does not take place in any areas designated as Peat Hydrological Unit ("KHG"; **Figure 5**).



**Figure 3.** Primary forest and peat moratorium area in the wider landscape

<sup>8</sup> Refer to the original version (Bahasa Indonesia) of Public Summary and the HCV-HCSA PT PBJ Main Report



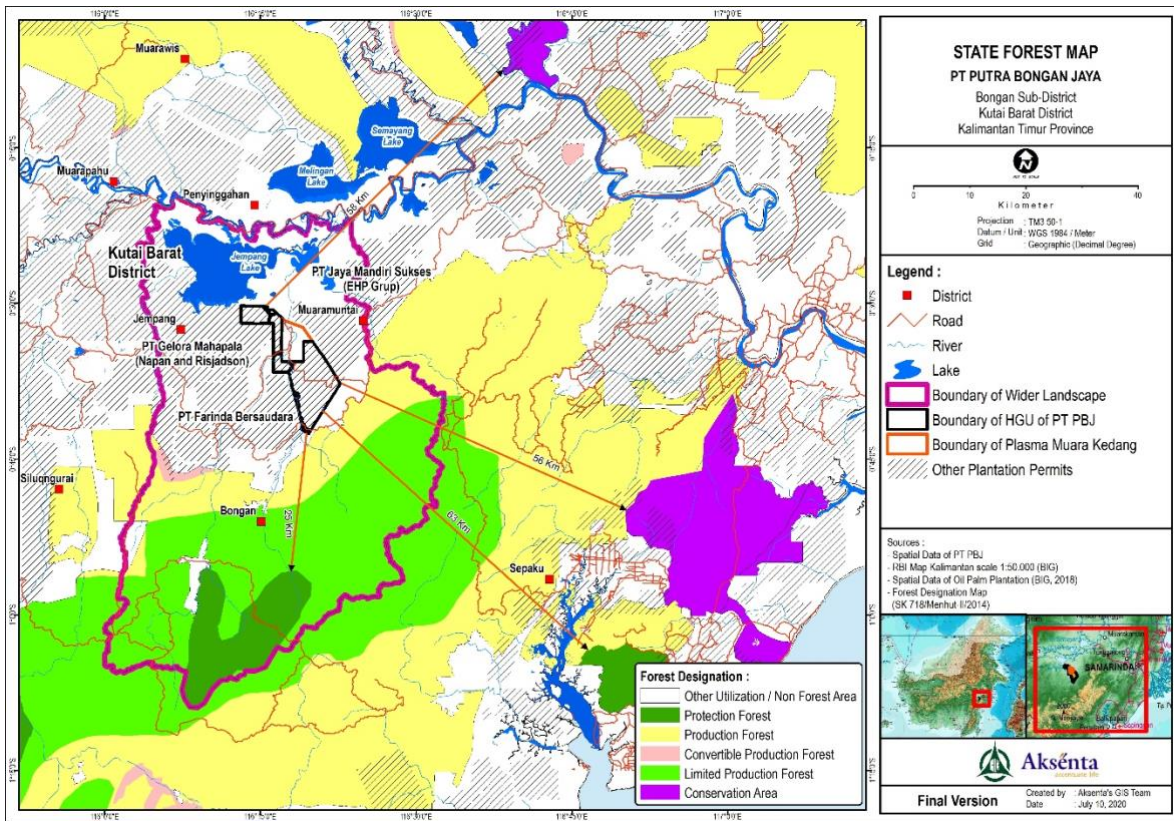


Figure 4. Map of forest areas in PT PBJ MU's wider landscape

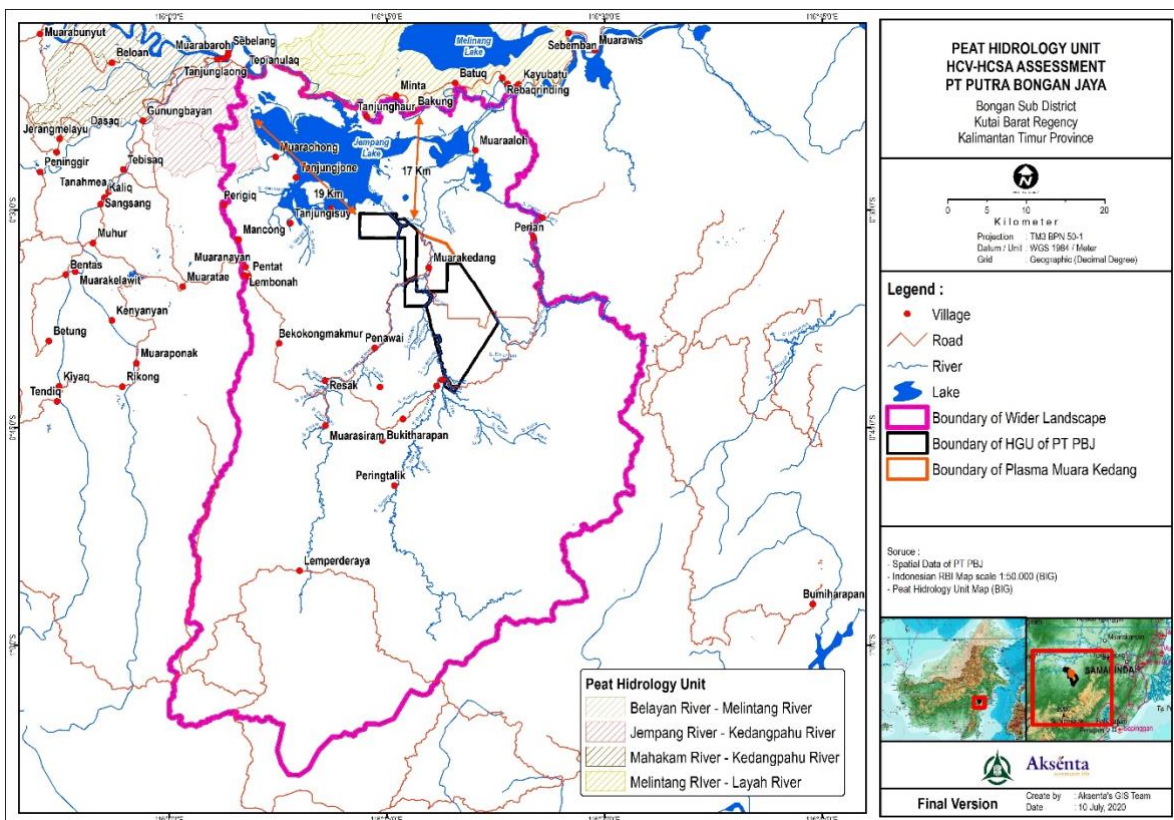
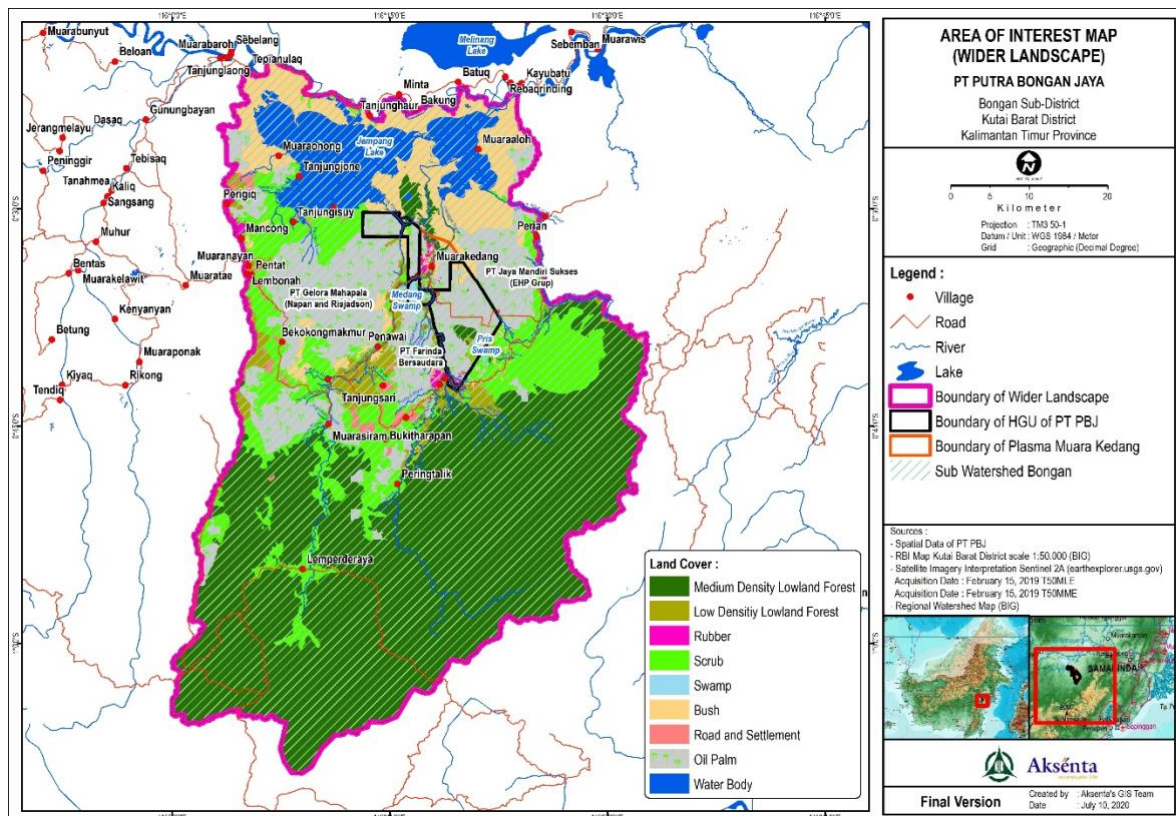


Figure 5. Map of Peat Hydrological Unit (KHG) in PT PBJ MU's wider landscape

## AoI (Area of Interest) boundaries

The AoI (wider landscape) area is 345,079.30 ha with various conditions of land cover. The basis of the AoI boundaries is the boundaries of upstream Bongan watershed – Mahakam watershed which was adjusted following the connectivity of land cover and areas that may potentially serve as habitats to wildlife species at the southern and eastern parts of PT PBJ concession. It includes 15 village administrative territories although only four are situated within, or overlapping with, PT PBJ MU's concession. They are Muara Gusik, Jambuk, Muara Kedang and Pulau Lanting that are directly impacted from the company business and activities. For this reason, only the four villages are used for social assessment boundaries (**Figure 6**).



**Figure 6.** Map of boundaries of PT PBJ MU's wider landscape (AoI)

## Physical landscape

See the following characteristics of physical environment in the PT PBJ MU and its surroundings.

- PT PBJ HGU concession is situated in the equator with wet tropical climate year-round. This area has two peaks of rain season, i.e. around February-March and October-November, with average rainfall of about 2,500-3,000 mm/year.
- PT PBJ HGU concession is at the elevation of 14-75 m a.s.l. with land slope variation ranging from 0 to 15%. The Assessment area belongs to the Central Lake Mahakam group alluvial plain (Lakes Jempang, Semayang and Melintang). Rolling and undulating areas are mostly located in the southern part (see **Sub-Section 3.3**).
- In general, soils in the company concession can be classified based on their parent materials consisting of two types: alluvial and clay rock (sediment). While soil survey in *Param Agricultural Soil Surveys* (2014) mentions that soils in the eastern part are organic clay muck (clay with high organic matter content), it also describes that the soil sample analysis output does not qualify peat soil criteria. As for the area in the south, it is entirely mineral soils (see **Sub-Section 3.3**).



- RePPPProT map (1987) indicates seven land systems in the Assessment area, representing three ecosystem forms, i.e. BLI, KLR, MDW and TNJ indicating Freshwater Swamp Forest (including grassland and open swamp), in addition to BLI (Riparian Forest), and LWW and TWH taking the form of mixed dipterocarp forests on alluvial soils (lowland).
- PT PBJ MU is entirely situated in Mahakam watershed,<sup>9</sup> particularly in Bongan sub-watershed. Flowing through the central-western parts of the area and from south to west, River Bongan empties to Lake Jempang which is an important lake in the watershed because it belongs to the group of Central Lake Mahakam.

### Biodiversity landscape

The Assessment area is located in the biogeographic zone of Borneo Island as one of the islands worldwide with high biodiversity. One of the causes behind such high biodiversity in this island is the presence of significantly large tropical rainforests. To illustrate the island's biodiversity, there has been recorded 267 Dipterocarpaceae species, 155 out of which are endemic to the island, in addition to 225 mammal species, 44 out of which are endemic (Payne *et al.*, 2000). Other species groups also have high diversity. In short, there are 639 bird species, 37 out of which are endemic (MacKinnon *et al.*, 2000); 166 snake species (Stuebing and Inger, 1999); and around 140-150 amphibian species (Inger and Stuebing, 1997). Borneo has about 15 thousand flowering plant species, three thousand out of which are woody plant species, 155 endemic plant species, 200 orchid species, and more than one thousand fern species (Whitten *et al.*, 1997).

See the following exposure on the MU position against conservation and key biodiversity areas.

1. Conservation area. The Assessment area is generally located quite far away from conservation areas (national park/NP, nature reserve and wildlife sanctuary). The nearest conservation area is Padang Luai Nature Reserve (51 km away northwest) and Muara Kaman Sedulang Nature Reserve (60 km northeast).
2. Key Biodiversity Area (KBA). The Assessment area is located near one of the KBAs, i.e. Meratus Mountains, separated by a production forest area.
3. Important Bird Area (IBA). The northern side of the Assessment area is directly bordered by an IBA taking form of Central Mahakam wetlands (KID 17). This IBA has several threatened bird species, namely white-shouldered ibis (*Pseudibis davisoni*), Storm's stork (*Ciconia stormi*), lesser adjutant (*Leptoptilos javanicus*) and Wallace's hawk-eagle (*Nisaetus nanus*). Lake Jempang is also recorded as the migration destination of several migrant water bird species such as little tern (*Sterna albifrons*) and whiskered tern (*Chlidonia hybridus*).
4. Endemic Bird Area (IBA). The southern side of the Assessment area is located near one of the EBAs in Borneo Island, i.e. Borneo Mountains Area (ID 157) whose endemic species include, among others, Bornean barbet (*Psilopogon eximius*), Bornean whistler (*Pachycephala hypoxantha*), and chestnut-crested yuhina (*Yuhina everetti*).
5. Ramsar site. Borneo Island has four sites of Ramsar convention, two out of which are in Indonesian Borneo, while the other two are in Malaysian Borneo. Both Ramsar sites in Indonesia are Lake Sentarum area and Tanjung Puting National Park. However, PT PBJ concession (the Assessment area) is located outside both areas.
6. Intact Forest Landscape ("IFL") and Heart of Borneo (HoB). Almost all IFLs in Borneo belong to HoB area. Based on IFL and HoB maps, it is known that the Assessment area is located outside, and even far away from, both. The nearest IFL is IFL SEA 224-1 and IFL SEA 224-2 (respectively about 138 km and 147 km), and the nearest one is around 98 km from the Assessment area.

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<sup>9</sup> Mahakam is one of the priority watersheds under Forestry Minister Decree No. SK. 328/Menhut-II/2009.

Based on map of distribution of biodiversity with important values in International Union for Conservation of Nature (“IUCN”) RedList, several RTE species are indicated to populate distributed areas that include AoI. They are Sunda pangolin (*Manis javanica*), white-shouldered ibis (*Pseudibis davisoni*), and Irawaddy dolphin (*Orcaella brevirostris*) with Critically Endangered (CR) status; Proboscis monkey (*Nasalis larvatus*), Müller's gibbon (*Hylobates muelleri*) and flat-headed cat (*Prionailurus planiceps*) with Endangered (EN) status; and sun bear (*Helarctos malayanus*), Sambar deer (*Rusa unicolor*), false gharial (*Tomistoma schlegellii*), and Amboina box turtle (*Cuora amboinensis*) with Vulnerable (VU) status. In addition, several plant species threatened and legally protected under Indonesian law are believed to still live in the Assessment area. They are *Hopea nervosa* (CR), *Amorphophallus titanium* and *Shorea bracteolata* (EN), *Anisoptera laevis*, *Eusideroxylon zwageri*, *Durio kutejensis* and *Gonystylus macrophyllus* (VU).

### Social, economic and cultural contexts

Based on interview with village government officials, it is known that total population of the four villages in the Assessment area is 4,675 people (1,409 households). See **Table 1** below for details on demographic data in each village in the AoI.

Ethnics populating Pulau Lanting include Kutai, Banjarese and Buginese community groups with relatively equal populations, while the other three villages are mostly populated by Kutai groups. Community in this area are mostly Muslims, while migrant people from East Nusa Tenggara, Toraja and Dayak indigenous peoples are mostly Christians.

Most tradition that community practices today relate to Islamic sharia (law). Traditional system that they currently maintain includes Kutai traditional leaders, village governments and tenurial affairs. Tradition to keep *simpukng* (fruit garden) is maintained because of its economic value, particularly durian fields that can be harvested annually. In addition, traditional chief’s view still prevails and is taken into account by officials when resolving issues, particularly those that relate to conflicts between community members, including conflicts over land boundaries/ownership.

Livelihoods of the communities of the four villages normally include farming and fishing in the rivers, swamps and lakes. Fish that they catch produces significant financial values. Presence of several oil palm plantation companies in Bongan and its vicinity, including PT PBJ, creates work opportunities for local communities. The company workers, especially who handle maintenance jobs, are mostly from Muara Gusik and Muara Kedang Villages.

**Table 1.** Demographic information of local villages in the AoI

No	Village	Area (ha)	Number of Household	Population (people)
1	Pulau Lanting	5,596	335	1,180
2	Muara Kedang	21,680	520	1,674
3	Muara Gusik	19,249	271	983
4	Jambuk	19,700	283	838
<b>Total</b>		<b>66,225</b>	<b>1,409</b>	<b>4,675</b>

Source: interview with village government officials (Aksenta team field survey, 2019)

Every village has their own social organisations that run their functions in synergy with village officials’ policies. Organisations that can be found in every village include BPK, Community Empowerment Institution, Family Prosperity Empowerment (PKK) and traditional institutions.

Muara Gusik and Jambuk Villages have sufficient infrastructures compared to Muara Kedang and Pulau Lanting. The former two are situated by the main land route (provincial road). Supported by the presence of ex-transmigration settlements in Resak area, trade activities that develop along the provincial road has accelerated the economic growth in both villages.

Education infrastructures in Bongan Sub-District area is considered complete. However, only elementary school is available in Pulau Lanting, forcing local community to go to Tanjung Isuy (Jempang Sub-District Capital) if they are to continue education to junior high school and high school. As for health facilities, they are available in each village and operated by medical personnel.

### **Spatial Plan and Landuse History**

Development of transportation modes in the AoI from river transportation to land route started with the presence of companies holding forestry business concession (logging companies). The provincial road connecting East and Central Kalimantan Provinces, that today are used as the main transportation vein by local community in the Assessment area and its surroundings was initially logging companies' operational road. Company presence also support community's business activities and landuse. Once the road access became available, community started building houses along the road, that later on formed settlements, and using lands around the settlements and road.

In early 2000, companies firstly introduced oil palm cultivation to community in the Assessment area. Currently oil palm plantation farming and business become the option that they made. Other than community oil palm plantation businesses, there are also companies that currently are holding business permits in the Assessment area, including PT PBJ, PT JMS (Jaya Mandiri Sukses), PT Gelora Mahapala, and PT Farinda Bersaudara. Oil palm plantation business operational activities are in line with East Kalimantan's Provincial Spatial Management and Plan 2016-2036, based on which the Assessment area is set as plantation zone.

Intact natural forest-covered areas are found in the southern part of the MU (**Figure 8**). These locations constitute forest areas that include Production Forest (directly bordering the southern part of the MU), Limited Production Forest and Protection Forest. To date, operational activities of the companies that hold business permits in the Production Forest Area still take place.

### **Image Analysis and Land Cover Classification**

Land cover classification involves satellite image pre-processing, as well as land cover segmentation and classification. The entire process takes place in ArcGIS 10.1 software. The satellite image used is Sentinel-2A acquired on 15 February 2019 consisting two scenes, i.e. T50MME and T50MLE (**Figure 7**). The company data (2017 aerial photograph) also uses to identify the initial land cover.

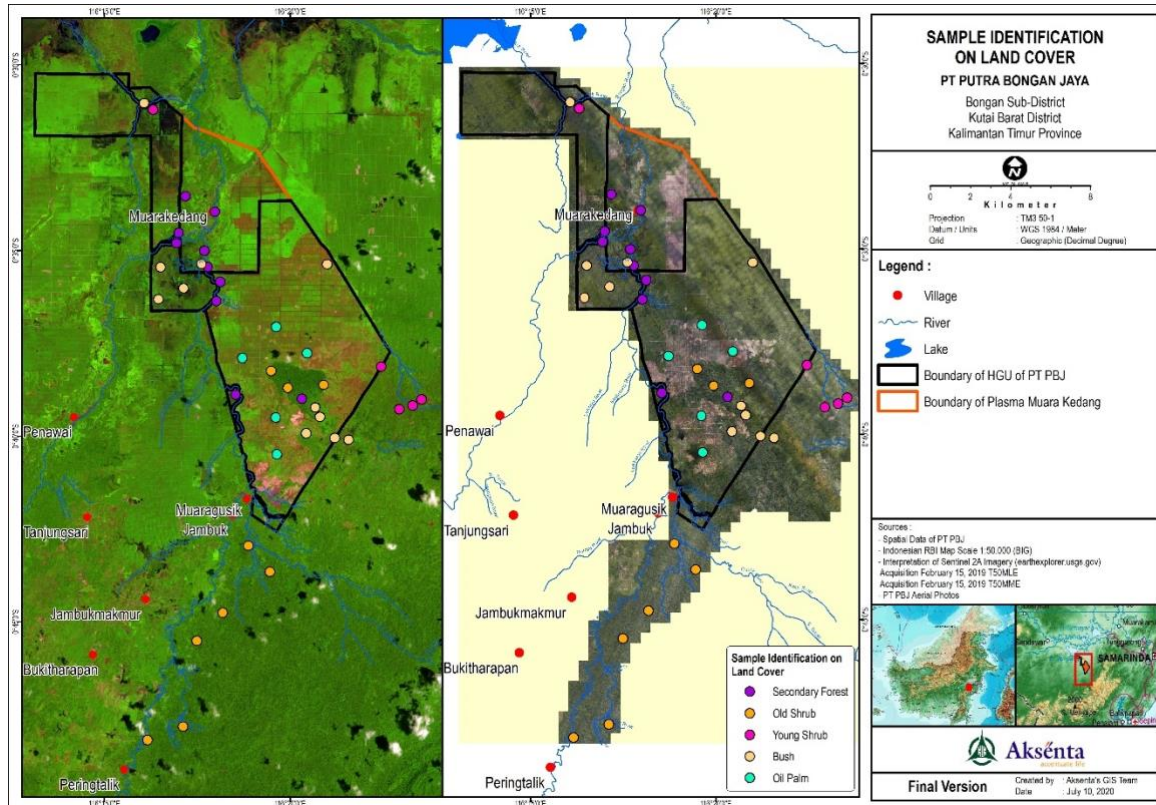
Segmentation process is carried out through visual interpretation with manual digitation (onscreen manual digitising) that takes into account the object colour, texture, form, location and size to distinguish an object from the others on the satellite image (Bakker *et al.*, 2009). The land cover classification used refers to Indonesian National Standard ("SNI") 7645-1:2014 on Land Cover Classification – Section 1: Small and Medium Scale. The classification is then categorised on basis of the land cover classification in HCV Approach Toolkit v2 (**Table 2**).

Land cover is verified through visual observation (Congalton and Green, 2009) and biomass measurement (Bakker *et al.*, 2009). The planned number of land cover verification sample is 350 spots that include seven land cover classes, i.e. medium-density secondary lowland forest, low-density secondary lowland forest, shrub, rubber plantation, bush, barren soil and oil palm plantation. The actual number is 356 spots during scoping study phase and 90 forest inventorying spots during full assessment.

On satellite image, it is difficult to distinguish rubber plantation from other land cover classes because its colour is similar to that of medium-density forest. Forest plantation distribution is identified through interview, participatory mapping with community and field observation. Groundtruthing also finds that the inland swamp is mostly covered with bush. Because of its

specific characteristics where the inundation is more intense than other bush areas, it is excluded as one single land cover class in final classification. See **Figure 8** for final land cover class.

Final land cover validation indicates values of 99.75% and 99.72% respectively using overall and kappa accuracies. These accuracy values already meet the minimum threshold of 80% for overall accuracy based on HCSA Toolkit v2 and 70% for kappa accuracy based on Cohen (1968), so that the final land cover classification can be used for Patch Analysis Decision Tree.



**Figure 7.** Locations of training sampling spots and areas on Sentinel satellite image and aerial photographs

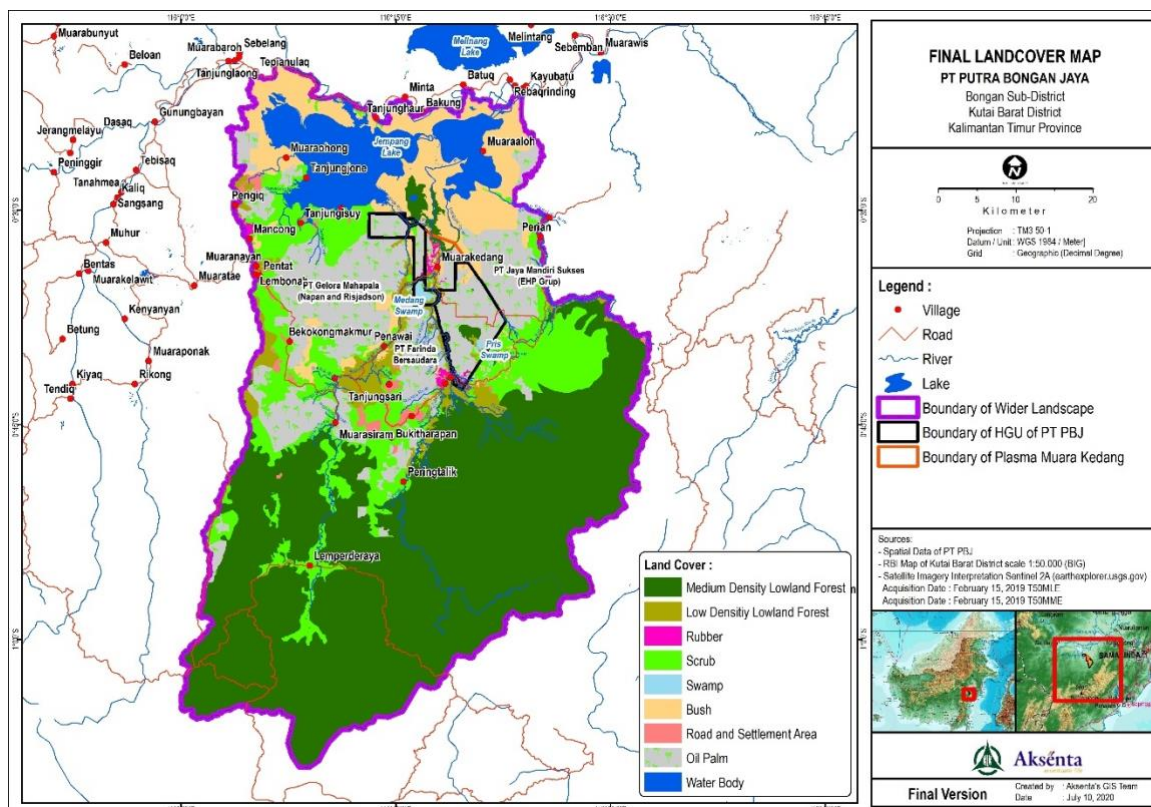


Figure 8. Final land cover map in the PT PBJ MU's wider landscape

Table 2. Land cover classification referring to Indonesia National Standard (SNI) and its equals under HCS land cover class

No	Land Cover Class	SNI Definition <sup>*)</sup>	HCS Land Cover Class	HCS Definition <sup>**)</sup>
<b>HCS Classes</b>				
1	Lowland secondary forest (medium density)	Forest that grows and develops in dryland habitat that takes form of lowland forest and has undergone human intervention. The density is 41%-70%.	Low to Medium Density Forest (LDF, MDF)	Closed canopy natural forest ranging from medium density to low density forest. Inventory data indicates presence of trees with diameter > 30cm and dominance of climax species.  Carbon amount ranges from 75 to 90 tonne C/ha (LDF) and 90 to 150 tonne C/ha (MDF)
2	Lowland secondary forest (low density)	Forest that grows and develops in dryland habitat that takes form of lowland forest that has undergone human intervention, with density of 10%-40%.	Young Regeneration Forest (HRM)	Highly disturbed forest or forest areas regenerating to their original structure. Diameter distribution dominated by trees 10-30cm and with higher frequency of pioneer species compared to LDF. This land cover class may contain small areas of smallholder agriculture.  Carbon amount ranges from 35-75 tonne C/ha.
<b>Non-HCS Classes</b>				
3	Shrub	Dryland on which various heterogeneous and homogeneous	Shrub (B)	Land areas that were once forest but have been cleared in the



No	Land Cover Class	SNI Definition <sup>*)</sup>	HCS Land Cover Class	HCS Definition <sup>**)</sup>
		<p>natural vegetation species grow with low to high density. Such area is dominated by natural lowland vegetation (SNI 7645-2010 land Cover Classification). In SNI 7645-1: 2014, shrub falls under thicket class (p.51).</p> <p>Vegetation formation or structure that takes form of groups of shrubs with height ranging from 50 cm to 2 m, dominated by woody vegetation alternated with very short trees (<math>\leq 5</math> m tall). Or:</p> <p>Dryland on which various heterogeneous and homogeneous natural vegetation grows with low to high density. Such area is dominated by short vegetation (natural).</p>		<p>recent past. Dominated by low scrub with limited canopy closure. Includes areas of tall grass and fern with scattered pioneer tree species. Occasional patches of older forest may be found within this category.</p> <p>Carbon amount ranges from 15 – 35 tonne C/ha.</p>
4	Rubber plantation	Lands planted with rubber trees, taking form of a vast and homogeneous expanse, with regular planting pattern, and managed by individuals and companies.	Forest Plantation (FP)	Large area planted with trees (e.g. rubber and acacia).
5	Oil palm plantation	Lands planted with oil palms, which take form of a vast expanse, with regular planting pattern, and are industry-oriented	Plantation area (AGRI)	E.g. large-scaled oil palm plantations in overlap with development areas.
6	Bush	Land cover that takes form of natural plants with average height of 0.5-2 m, some of which are woody while some are not.	Other Barren Soil (LT)	Recently cleared land, mostly consisting of grasses or plants, with only few woody plants.
7	Inland swamp	Vast, permanent area of freshwater swamp in an inland area, characterised with relatively thick and wide puddle		Water bodies such as river and lake. Development area, settlement, road, etc.

No	Land Cover Class	SNI Definition*)	HCS Land Cover Class	HCS Definition**)
8	Roads and settlement areas	<p><b>Road network:</b> Developed area comprising one or more lanes on both sides that can still be developed for non-railway transportation. These lanes may take form of concrete, asphalt or hardened and consolidated soil. For areas which are less than 1 mm wide on image, they need to be represented with straight line, and if they are too small to be seen on the image, data can be taken from basemaps such as Indonesia Topographic Map (RBI) or other topographic maps.</p> <p><b>Urban settlement:</b> Manmade land cover taking the form of buildings mainly used by urban population for their dwelling. Urban settlement buildings are characterised with high building density and made out of permanent/long-lasting materials such as brick wall, tile/concrete/zinc roof</p> <p><b>Rural settlement:</b> Manmade land cover in the form of premises for rural population's residence. Rural settlement is characterised with relatively low density of building, can be constructed out of not only permanent/long-lasting materials such as concrete wall, roof tile/concrete roof/iron roof sheet, but also non-permanent materials such as wooden wall, and thatched roof, and is associated with use of agricultural lands such as rice field, dry rice field, or mixed garden and house yard.</p>		
	Water body	Any naturally occurring body of water (including natural lake/pond, river/stream, marine waters and swamp)		

### 1.3. Area and Time Line for New Planting

Total management area is 19,689.53 ha (GIS acreage 19,686.2 ha), consisting of oil palm plantation 9,971.34 ha, HCS and HCV 6,213.0 ha, and the rest is land bank for oil palm plantation. PT PBJ has any land compensation liability or land in sanction. PT PBJ will immediately delineate and demarcate HCV and HCS areas. The initial steps that have been taken are limited to socializing the existence of HCV and HCS areas that must be protected, both to internal and external parties.

New planting in an area of 788.82 ha will start in 2021 (**Table 3** and **Figure 9**).

**Table 3.** Planned locations of new planting in PT PBJ MU concession

Year	Area (ha)*
2021	396.77
2022	203.96
2023	188.09
<b>Total (ha)</b>	<b>788.82</b>

\*) The total area for the new planting for each year based on GIS data calculation that's not overlapping with the conservation area in ICLUP Final

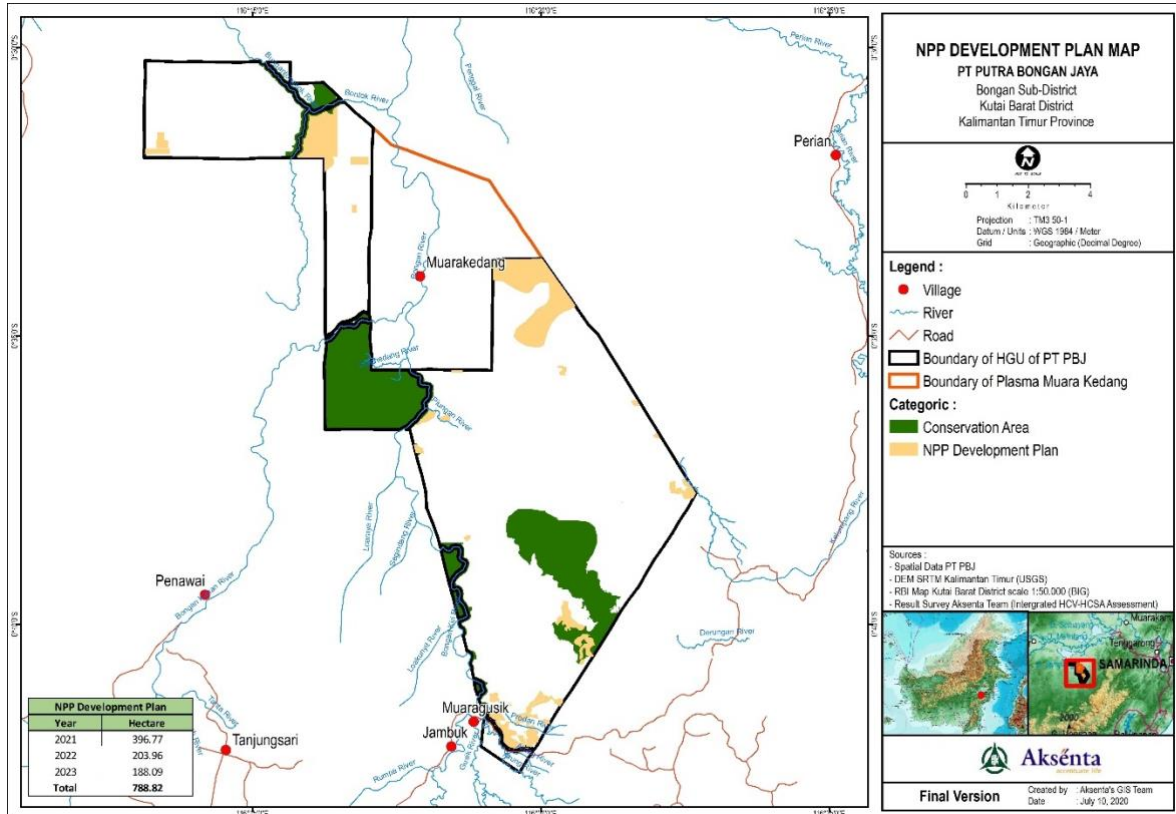


Figure 9. Map of the planned new planting locations



## 2. Assessment Process and Methods

### 2.1. Social and Environmental Impact Assessment (SEIA)

#### Dates of Activities

A revision of Environmental Impact Assessment (“EIA”) took place in 2019 out of the changes in shareholding, the planned mill development previously excluded, and integration of 2008 EIA document and the EIA revision into construction of embankment, drainage and sluice in 2018, for which permit has been issued by Investment and One-Roof Integrated Service Office. The EIA does not provide any information regarding when the EIA itself was conducted. PT PBJ was established since 2005 based on notarial deed number 28 of August 30, 2005 issued by Public Notary Lia Cittawan Nanda Gunawan, SH. Initially, PT PBJ was under the auspices of Rea Holding Plc, but since September 2018 PT PBJ has been acquired by the KLK group.

Social Impact Assessment Review and Update (“SIA Review and Update”) is also carried out in 2019. Its field activity was carried out on 28 January – 6 February 2019 simultaneously with the High Conservation Value-High Carbon Stock Approach (“HCV-HCSA”) field assessment. See **Table 4** for detail on the field assessment timeline.

**Table 4.** Timeline of SIA Review and Update in PT PBJ concession

Activity	Timeline	Venue
Pre-assessment	3-20 January 2019	Aksenta office, Jakarta
Opening Meeting, Stakeholder Mapping, Field Scoping and Document Review	28 January 2019	PT PBJ Lobby
Field data collection: in-depth interview and Focus Group Discussion (FGD)	28 January-5 February 2019	PT PBJ estate and office, Pulau Lanting, Jambuk, Muara Gusik, and Muara Kedang Villages.
Closing meeting	6 February 2019	PT PBJ Lobby
Data analysis, social issue, impact and risk mapping, and drawing conclusion.	February-April 2019	Jakarta
Preparation of the SIA Review and Update report	October 2019	Jakarta

#### Assessors and Their Credentials

Environmental Impact Statement (ANDAL) revision and Environmental Management and Monitoring Plan (RKL-RPL) are studied by PT Jump Consulting (Phone: +62541-7776675, e-mail: [kmaridan@yahoo.co.id](mailto:kmaridan@yahoo.co.id)), an EIA Document Preparation Service Provider (LPJP AMDAL). The EIA team consists of six members and one leader (**Table 5**). As for the SIA Review and Update, this is carried out by PT Gagas Dinamiga Aksenta (“Aksenta”) Team of four, including one coordinator (**Table 6**).

**Table 5.** Environmental Impact Assessment (EIA) team

Name	Position in Team	Expertise/Certificate
Junser Naibaho, MSi	Team Leader	Master’s Degree on Environmental Science / K.564.00154.2018
Dr. Slamet Rifanjani, S. Hut, MP	Member	Postgraduate on Forestry and Environmental Science / K.642.00149.2017
Herlina Darwati, S. Hut, MP	Member	Master’s Degree on Forestry and Environmental Science / A.642.00212.2018
Ir. Evi Pujiastuti	Expert	Bachelor’s Degree on Socio-Economic Field of Agriculture

Name	Position in Team	Expertise/Certificate
		/ A.642.00116.2018
I Kadek Semara Artha, SKM	Expert	Bachelor's Degree on Public Health / A.564.00002.2019
Luhur Arief Prastya, ST	Expert	Bachelor's Degree on Environmental Engineering / Environmental Field
Febrianto Mauldansyah	Expert	Bachelor's Degree on Forestry / GIS

**Table 6.** SIA Review and Update team

Name	Role	Institution	Expertise	Experience
Andri Novi Hendarto	Reporting Coordinator	Aksenta	Socio-economic aspects, social impact management, socio-cultural aspects, and participatory mapping.	Country: Indonesia, Papua New Guinea and Malaysia Language: Indonesian and English
Ali Akbar Hutzi	Socio-economic expert	Aksenta	Environmental economics, socio-economic and cultural aspects, and social institutions	Country: Indonesia and Malaysia Language: Indonesian and English
Noor Rakhmat Danumiharja	Social, economic and cultural expert	Aksenta	Socio-economic aspects, social impact assessment, socio-cultural aspects, participatory mapping and institutional facilitation.	Country: Indonesia and Malaysia Language: Indonesian and English
Martinus Sidik Purnomo	Socio-economic and social liability expert	Aksenta	Environmental economics, social, economic and cultural aspects, and social institutions.	Country: Indonesia and Malaysia Language: Indonesian and English

## Assessment Methods

### SEIA

Important impacts are estimated through the following phases.

1. *Impact magnitude estimation.* Impact magnitude accounts for the gap between environmental characteristics/quality with and without activity in place.

$$\text{Estimated Magnitude of Impact} = KL_P - KL_{RLA}$$

Where:

EQ<sub>P</sub> : Scale of environmental quality with activity/project in place.

EQ<sub>B</sub> : Scale of environmental quality at the initial condition/baseline (without project).

2. *Impact important characteristic determination.* Impact's important characteristics are defined following Government Regulation No. 27/2012 on Environmental Permits. Particularly for social, economic and cultural components, these refer to the definition by Prof. Susetyawan (based on Koentjaraningrat's Theory of Institution, 2000).

### Review and Update SIA

Approach used in the SIA Review and Update is the following principles.

1. *Participatory.* Issue identification and information collection are carried out on a participatory basis. This participatory approach position participants as subject in mapping social issues they experience, expressing their opinions and views, and getting involved in designing management and changes.
2. *Multi-stakeholder.* Issues are identified and information is collected involving stakeholders

directly or indirectly involved in having or taking impacts.

3. *Rapid and ex-ante*. Issue identification and information collection are carried out rapidly and based more on forecast of tendencies of changes to occur rather than accurate factual data, which is a solution for the limited application of SIA approach<sup>10</sup> and limited time.
4. *Appreciative*. Issue identification and information collection are positively guided to include not only identification of gaps but also exploration of expectations, potentials and ideas in search of solution for the social issues that are happening.
5. *Social learning cycle*. A SIA is not a one-off linear process; but rather, it is a cycled process that serves as social learning efforts to respond to changes in environment.

Data collection techniques include the following.

1. Study of documents and secondary data.
2. *Dialogue*.
3. Field observation
4. *In-depth interview*.
5. *Triangulation*.

Analytical framework over output is carried out using the link to social sustainability aspects and changes in Asset Pentagon<sup>11</sup> elements, i.e. (i) human capital; (ii) social capital; (iii) natural capital; (iv) physical capital; and (v) financial capital. Conditions of any issues of significance, along with their impacts on the elements/assets, are described.

## 2.2. HCV-HCSA Assessment

### Dates of activities

PT PBJ has carried out HCV assessments in 2009<sup>12</sup> and 2015<sup>13</sup>, which is why in 2019 the company carries out an HCV assessment integrated into HCSA assessment. This HCV-HCSA assessment was carried out in January to September 2019, involving three major phases, i.e. pre-assessment, scoping study (**Table 7**) and full assessment (**Table 8**). The sample and field activities location show in the **Figure 10**, **Figure 11**, **Figure 13**, and **Figure 14**. The integrated HCV-HCSA assessment final report was declared satisfactory by HCV Resource Network (HCVRN) Assessor Licencing Scheme (ALS) on October 9, 2020.<sup>14</sup>

**Table 7.** Summary of scoping study activity description

Activity	Description	Timeline
Initial survey	<ul style="list-style-type: none"> <li>▪ Understanding the landscape context resulted from the desktop study</li> <li>▪ Groundtruthing the initial land cover</li> <li>▪ Identifying potential HCV and HCS</li> <li>▪ Visit to sample community members</li> <li>▪ Identifying stakeholders and initial consultation</li> <li>▪ Document review at the company office</li> </ul>	23-26 January 2019

<sup>10</sup> Colantonio (2008).

<sup>11</sup> DFID (1999) proposes *Pentagon Capital*.

<sup>12</sup> The Important Natural Areas of the Bongan Jaya Estate (WWF, 2009)

<sup>13</sup> HCV Assessment for PT Putra Bongan Jaya (PBJ1) (Aksenta, 2015) and HCV Assessment for PT Putra Bongan Jaya (PT PBJ3) (Aksenta, 2015)

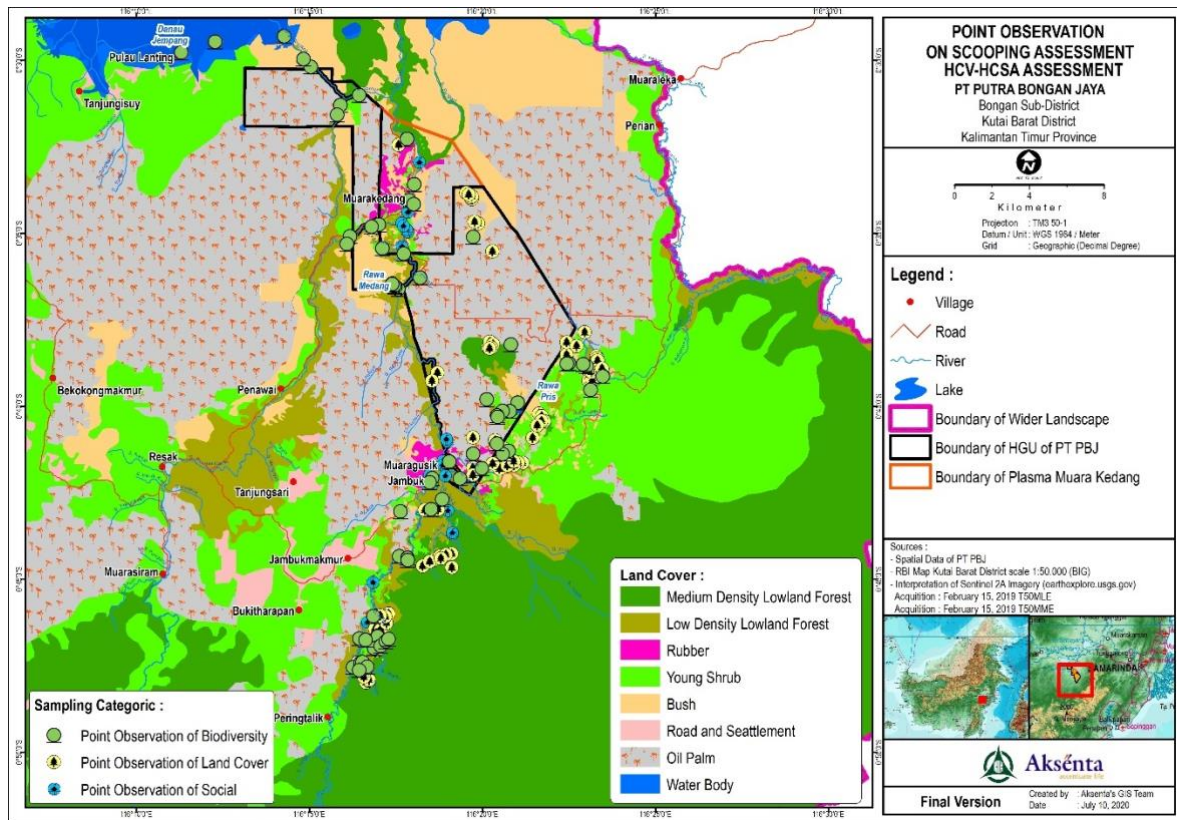
<sup>14</sup> <https://hcvnetwork.org/reports/laporan-kajian-hcv-hcs-terpadu-pt-putra-bongan-jaya-kabupaten-kutai-barat-kalimantan-timur-indonesia-versi-1-0/>

Activity	Description	Timeline
Checking initial land cover map against the actual condition on the ground	<p>Initial verification:</p> <ul style="list-style-type: none"> <li>▪ Forest cover in the southern part of the Location Permit concession: the actual condition is secondary forest</li> <li>▪ Oil palm plantation to the east of River Bongan in Jambuk Village within the location permit concession: the actual condition is PT Farinda Bersaudara's plasma oil palm plantation.</li> <li>▪ Shrubs in several locations in the HGU concession: the actual condition is community's shrublands that remain in their possession (not rendered to the company).</li> <li>▪ Shrubs in several locations in the eastern side of the Location Permit concession</li> </ul>	23-26 January 2019
Visit to sample community members	<ul style="list-style-type: none"> <li>▪ Initial visit to local villages: interview and field orientation in Pulau Lanting, Jambuk, Muara Gusik and Muara Kedang Villages.</li> <li>▪ Verification of the preassessment output (due diligence)</li> </ul>	23-25 January 2019
Identification of stakeholders and initial consultation	<ul style="list-style-type: none"> <li>▪ Interview and discussion with leaders of Lanting, Muara Kedang, Muara Gusik and Jambuk Villages.</li> <li>▪ Interview and discussion with NGOs: TNC, Ecositrop, RASI, Grapesda.</li> <li>▪ Interview and discussion with government agency: East Kalimantan Natural Resources Conservation Agency ("BKSDA").</li> </ul>	24-25 January 2019

**Table 8.** Timeline of the Integrated HCV-HCSA Assessment in PT PBJ MU concession

Phase	Activity	Location	Timeline
<b>PREASSESSMENT</b>			
Information exchange and desktop study	▪ Collection of initial data and information from the company concerning the project status.	Aksenta office, Jakarta	14-20 January 2019
	▪ Collection of initial data from secondary sources (report, journal, book, statistics, and basemap) and informants.		
	▪ Data and spatial analysis		
<b>SCOPING STUDY</b>			
Scoping study	<ul style="list-style-type: none"> <li>▪ Field visit and initial consultation with Pulau Lanting, Muara Kedang, Muara Gusik, and Jambuk Village Heads</li> <li>▪ Initial consultation with East Kalimantan Provincial Natural Resources Conservation Agency (BKSDA) &amp; NGOs (TNC, Ecositrop, &amp; Grapesda).</li> <li>▪ Initial checking of ground cover resulted from desktop study.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Bongan Sub-District</li> <li>▪ Samarinda and Tenggarong</li> <li>▪ PT PBJ</li> </ul>	23-26 January 2019
	▪ Establishing field survey timeline and field assessment's support facilities.	PT PBJ Office	23-26 January 2019
<b>ASSESSMENT</b>			
Field survey	<ul style="list-style-type: none"> <li>▪ Checking of land cover resulted from desktop study.</li> <li>▪ Field data collection.</li> <li>▪ Interview and confirmation with stakeholders.</li> <li>▪ Field data compilation and team's internal coordination</li> </ul>	PT PBJ concession and 4 surrounding villages	28 January – 5 February 2019
Participatory mapping	Workshop with informants and community members who have knowledge over and experience with the assessment area.	4 villages around PT PBJ concession	28 January - 5 February 2019
Closing meeting	<ul style="list-style-type: none"> <li>▪ Presentation and discussion with the MU.</li> <li>▪ Submission of interim report.</li> </ul>	PT PBJ office	6 February 2019
Stakeholder	Direct meeting for presenting the assessment output and	▪ Samarinda and	July 2019

Phase	Activity	Location	Timeline
consultation (final)	taking inputs and correction from stakeholders that include: local communities, local governments, relevant district and provincial government institutions, and NGOs and companies operating around the assessment area.	■ Bongan Sub-District	
	Consultation and communication by phone with community members upon review by HCVRN. Carried out to complete the assessment outputs.	Muara Kedang Village (community) and Bogor (assessment team)	February 2020
Analysis and reporting	<ul style="list-style-type: none"> <li>■ Field data and spatial data analyses.</li> <li>■ Making of draft report</li> <li>■ Aksenta's internal QC</li> <li>■ Report finalisation</li> <li>■ First report submission to HCVRN</li> </ul>	Aksenta office, Jakarta	February-September 2019  Final Report: July 2020



**Figure 10.** The point observation of scoping study, including villages and land cover representatives

### Assessors and Their Credentials

PT PBJ Integrated HCV-HCSA assessment are carried out by Aksenta whose office address is Jalan Gandaria VIII/10, Kebayoran Baru, Jakarta 12130; Phone/fax: +62 21 739-6518; e-mail: [aksenta@aksenta.com](mailto:aksenta@aksenta.com). The assessment team consists of 12 members and led by ALS Licensed Assessor and HCS Registered Practitioner (**Table 9**).



**Table 9.** The HCV-HCSA Assessment Team

Name	Role	Institution	Expertise	Experience
Idung Risdiyanto	Lead Assessor (ALS15029IR); <i>HCS Registered Practitioner</i>	Aksenta	Hydrology, forest ecology, spatial modelling, carbon stock, land suitability, peat survey, watershed management, and soil and water conservation.	Country: Indonesia, Papua New Guinea, Malaysia Language: Indonesian and English
Bias Berlio Pradyatma	GIS and remote sensing expert; <i>HCS Registered Practitioner</i>	Aksenta	Remote sensing, GIS, spatial analysis, carbon stock, land cover change	Country: Indonesia and Malaysia Language: Indonesian and English
Tedi Setiadi	Biodiversity expert	Aksenta	Wildlife identification, wildlife ecology and conservation, and management and resolution of conflict with wildlife.	Country: Indonesia and Papua New Guinea Language: Indonesian and English
Anwar Muzakkir	Biodiversity and ecosystem expert	Aksenta	Flora identification, landscape ecology and ecosystem management.	Country: Indonesia and Malaysia Language: Indonesian and English
Ali Akbar Hutzi	Social and economic expert	Aksenta	Environmental economics, social, economic and cultural aspects and social institutions.	Country: Indonesia and Malaysia Language: Indonesian and English
Heidei Putra Utama	GIS and remote sensing expert	Aksenta	Remote sensing, GIS, spatial analysis and land cover change.	Country: Indonesia and Malaysia Language: Indonesian and English
Noor Rakhmat Danumiharja	Social, economic and cultural expert	Aksenta	Socio-economic aspects, social impact management, socio-cultural aspects, participatory mapping, and institutional facilitation.	Country: Indonesia and Malaysia Language: Indonesian and English
Martinus Sidik Purnomo	Socio-economic and social liability expert	Aksenta	Environmental economics, social, economic and cultural aspects, and social institution.	Country: Indonesia and Malaysia Language: Indonesian and English
Priyo Dwi Utomo	GIS, flora and carbon expert	Aksenta	Carbon stock assessment, GIS, spatial analysis, and land cover change.	Country: Indonesia Language: Indonesian and English
Tengku Haikal	Soil and carbon expert	Aksenta	Land suitability assessment, peatland survey and management and carbon stock.	Country: Indonesia Language: Indonesian and English
Ahmad Syirojudin	Flora and carbon expert	Aksenta	Flora identification, forest ecology and carbon stock.	Country: Indonesia Language: Indonesian and English
Rahmat Darmawan	Flora and carbon expert	Aksenta	Flora identification and carbon stock.	Country: Indonesia Language: Indonesian and English

### Assessment Method

The Integrated HCV-HCSA Assessment for PT PBJ employs several guides as follow: (i) *Common Guidance for the Identification of High Conservation Values* (Brown *et al.*, 2017) for identifying HCV 1, HCV 2, HCV 4, HCS 5 and HCV 6; (ii) *Panduan Identifikasi Kawasan Bernilai Konservasi Tinggi di Indonesia* (Consortium for Revision of the HCV Toolkit for Indonesia, 2008)

for identifying HCV 3; (iii) *Common Guidance for the Management and Monitoring of High Conservation Values* (Brown *et al.*, 2018); (iv) *HCV-HCSA Assessment Manual* (HCVRN, 2017); (v) *Guidance for Using the HCV-HCSA Assessment Report Template* (HCVRN, 2018); (vi) *HCV-HCSA Assessment Report Public Summary Template with Guidance* (HCVRN, 2018); and (vii) *The HCS Approach Toolkit v2.0* (Rosoman *et al.*, 2017) for identifying HCS areas.

### Preassessment

Preassessment is an initial phase carried out before the assessment implementation is mutually agreed upon by the Assessment team and the company. Two major issues are assessed in this phase, i.e. (i) meeting of precondition (due diligence) for the Assessment implementation (*see Table 23 in Sub-Section 3.2*); and (ii) the company's approval and capacity to meet the requirements in the assessment implementation. One of the important aspects that serves as the limiting factor in this precondition assessment process is the takeover of PT PBJ from REA Holdings plc by KLK Group on 20 September 2018, because of which certain data, documents and information necessary for assessing the precondition are not sufficiently available during the preassessment phase. Consequently, relevant documents, data and information are constantly verified throughout all phases of this Assessment up to the full assessment.

### Scoping Study

Major activities in this phase are classified into two. *First*, substance-related study and, *second*, planning and availability of supporting facilities for implementing full assessment. Sample locations of this scoping study is taken to representatives of land cover, as well as areas with potential HCV, biophysical and social values (**Figure 10**).

### Method for environmental HCVs (full assessment)

Relevant information is collected through desktop study (**Table 10**). To assess HCV 1-3, Borneo biodiversity-related thematic maps are collected, along with the updated information on important species in the global and national contexts. In addition, secondary data and information are also gained from experts through initial consultation.

**Table 10.** References and sources of secondary data used in the HCV-HCSA Assessment

Category	Type of data and information	Data source	Description of the literature relevance to the study topic
<b>Environmental HCVs</b>			
HCV 1	<ul style="list-style-type: none"> <li>▪ Conservation area maps.</li> <li>▪ IUCN Red List of Threatened Species.</li> <li>▪ Appendices I, II and III, valid from 14 September 2014</li> <li>▪ Birds of Sumatera, Java, Bali and Borneo.</li> <li>▪ Important areas to bird: Kalimantan</li> <li>▪ Turtles and crocodiles of Indonesia &amp; Papua New Guinea</li> <li>▪ Sentinel 2 satellite image</li> </ul>	<ul style="list-style-type: none"> <li>▪ Ministry of Environment and Forestry</li> <li>▪ <a href="http://www.iucnredlist.org">www.iucnredlist.org</a></li> <li>▪ CITES, 2014</li> <li>▪ MacKinnon <i>et al.</i>, 2000</li> <li>▪ Holmes <i>et al.</i> 2001</li> <li>▪ Iskandar, 2000</li> <li>▪ <a href="http://www.earthexplorer.usgs.gov">www.earthexplorer.usgs.gov</a></li> </ul>	-
HCV 2	<ul style="list-style-type: none"> <li>▪ Conservation area maps</li> <li>▪ Sentinel 2 satellite image</li> <li>▪ Map of Intact Forest Landscape (IFL)</li> <li>▪ Maps of Key Biodiversity Areas (KBA)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Ministry of Environment and Forestry</li> <li>▪ <a href="http://www.earthexplorer.usgs.gov">www.earthexplorer.usgs.gov</a></li> <li>▪ <a href="http://www.intactforests.org">www.intactforests.org</a></li> <li>▪ <a href="http://www.keybiodiversityareas.org">www.keybiodiversityareas.org</a></li> </ul>	-
HCV 3	<ul style="list-style-type: none"> <li>▪ Sentinel 2 satellite image</li> </ul>	<ul style="list-style-type: none"> <li>▪ <a href="http://www.earthexplorer.usgs.gov">www.earthexplorer.usgs.gov</a></li> </ul>	-

Category	Type of data and information	Data source	Description of the literature relevance to the study topic
	<ul style="list-style-type: none"> <li>▪ Land system map</li> <li>▪ Terrestrial ecoregion map</li> </ul>	<ul style="list-style-type: none"> <li>▪ RePPPProT, 1990</li> <li>▪ www.databasin.org</li> </ul>	
Forest inventory and carbon stock estimation	<ul style="list-style-type: none"> <li>▪ Procedure of GHG Assessment for New Development, v.3.</li> <li>▪ HCS Approach Toolkit v.2</li> <li>▪ Monograph: Allometric Models for Estimating Tree Biomass at Various Forest Ecosystem Types in Indonesia</li> <li>▪ Sentinel 2 satellite image</li> <li>▪ Guide to Use of Allometric Model for Estimating Biomass and Forest Carbon Stock in Indonesia</li> </ul>	<ul style="list-style-type: none"> <li>▪ RSPO, 2016</li> <li>▪ HCSA Steering Group, 2017</li> <li>▪ Krisnawati <i>et al.</i>, 2012</li> <li>▪ www.earthexplorer.usgs.gov</li> <li>▪ Forest Research and Development Agency Head Regulation No. P.01/VIII-P3KR/2012</li> </ul>	-
<b>Social HCVs</b>			
HCV 4	<ul style="list-style-type: none"> <li>▪ Watershed boundary map</li> <li>▪ Land system map</li> <li>▪ River network map</li> <li>▪ PT PBJ's semi-detailed soil map</li> <li>▪ Peat Hydrological Unit (KHG) map</li> <li>▪ Digital Elevation Model 30 metre, SRTM</li> <li>▪ Sentinel 2A satellite image (tile T50MME and T50MLE), acquired on 15 February 2019</li> <li>▪ PT PBJ data of monthly rainfall</li> <li>▪ 2005-2018 hotspot data</li> <li>▪ Minute of company's land fire occurrences</li> <li>▪ Environmental Statement (ANDAL) document</li> </ul>	<ul style="list-style-type: none"> <li>▪ Ministry of Environment and Forestry, 2017</li> <li>▪ RePPPProt, 1990</li> <li>▪ Geospatial Information Agency (BIG), 2017</li> <li>▪ Param, 2014</li> <li>▪ Ministry of Environment and Forestry, 2017</li> <li>▪ USGS, 2017</li> <li>▪ www.earthexplorer.usgs.gov</li> <li>▪ PT PBJ</li> <li>▪ www.firms.modaps.eosdis.nasa.gov</li> <li>▪ PT PBJ</li> <li>▪ PT PBJ</li> </ul>	Through this data, the assessors got an initial description of the presence, boundaries and characteristics of rivers in the study area. Hotspot data from 2005-2018 is also used to determine patterns, indications and impacts on the presence of rivers. River and peat distribution maps will also help assessors to assess the ecosystem services to surrounding communities.
HCV 5	<ul style="list-style-type: none"> <li>▪ Map of settlement distribution</li> <li>▪ <i>Kabupaten Kutai Barat dalam Angka 2018</i></li> <li>▪ <i>Kecamatan Bongan dalam Angka 2017</i></li> <li>▪ <i>Kecamatan Jempang dalam Angka 2017</i></li> <li>▪ Law 6 of 2014 on Villages</li> <li>▪ Document on donation and land compensation from the company</li> <li>▪ The company's Corporate Social Responsibility (CSR) documents</li> </ul>	<ul style="list-style-type: none"> <li>▪ BIG, 2017</li> <li>▪ West Kutai District BPS, 2018</li> <li>▪ West Kutai District BPS, 2017</li> <li>▪ West Kutai District BPS, 2017</li> <li>▪ Law</li> <li>▪ PT PBJ</li> <li>▪ PT PBJ</li> </ul>	An overview of community livelihoods is depicted in BPS data at both the district and subdistrict levels. The Act on Villages can also illustrate the potential for village development which allows for an increase in the quality of community life. Likewise, the company compensation document will be helpful in identifying whether there is land release on which there is an important area for community livelihoods.
HCV 6	<ul style="list-style-type: none"> <li>▪ Map of settlement distribution</li> <li>▪ <i>Kabupaten Kutai Barat dalam Angka 2018</i></li> <li>▪ <i>Kecamatan Bongan dalam Angka 2017</i></li> <li>▪ <i>Kecamatan Jempang dalam Angka 2017</i></li> <li>▪ UNESCO World Heritage sites</li> </ul>	<ul style="list-style-type: none"> <li>▪ BIG, 2017</li> <li>▪ West Kutai District BPS, 2018</li> <li>▪ West Kutai District BPS, 2017</li> <li>▪ West Kutai District BPS, 2017</li> <li>▪ www.whc.unesco.org</li> </ul>	To find out indications related to the social and cultural conditions of the local community

During field data collection, there has been recorded 10 informants getting interviewed concerning biodiversity aspect (**Table 11**). In overall, environmental field survey is carried out at 322 observation spots. Such number is divided into four locations. This activity includes forest



inventory plots; HCV 1-3 field observation that includes flora and fauna species identification, and verification of rare and threatened ecosystems; land cover groundtruthing; and river-related HCV 4 field observation.

**Table 11.** Summary of interview during field data collection

Experts/Organisations/ Social Group	Name	Interaction Type	Consideration and/or Recommendations
PT PBJ Employee	Yudi	Guide; Discussion	Distribution of natural forest in locations where important animal species are present.
Muara Kedang community member	Maniansyah, Haidir	Interview	Presence of important animal species
Jambuk community member	Agus Toke	Interview	Land cover change, hunting activities, presence of important wildlife species.
A community member living in in the eastern part of the Location Permit concession	Jarno	Interview	Presence of important wildlife species and landuse change in the eastern part of the Location Permit concession.
Muara Gusik community member	Atung, Junaedi	Interview	Condition of forest to the south of Muara Gusik; logging activities in 1980s by logging companies; the presence of important wildlife and plant species.
Pulau Lanting community member	Ikram	Interview	Presence of animals in the southern part of Lake Jempang.
Muara Kedang community member	Robi	Interview	Big trees in his farm no longer exist. Only fruit plants and White Meranti ( <i>Shorea spp</i> ) remains. Forests to the north and northeast are still in good conditions and remain undisturbed. There are wildlife species such as Müller's gibbon, maroon leaf monkey, and southern pig-tailed macaque. <i>Eusideroxylon zwageri</i> and some <i>Shorea</i> species are still found.
Muara Kedang community member	Solihin	Interview	Not so many tall trees remain in swamp areas, except for bintangur ( <i>Calophyllum spp</i> ), kendikara ( <i>Dillenia excelsa</i> ), jambu air ( <i>Syzygium aqueum</i> ), jeruma ( <i>Mimosa tenuiflora</i> ), pinang kode, rumput perumbung, kumpai batu/kumpai lanja ( <i>Phragmites karka</i> , <i>Phlegmariurus phlegmaria</i> ) and <i>Bemban Donax canifformis</i> . Wildlife species that can be found include Proboscis monkey, false gharial, and several water bird species.
Muara Kedang community member	Rivai	Interview	Water flowing to Bongan Kiri from swamps around Muara Kedang was once clean, not polluted as it is now, probably because of an outlet from PT Farinda's oil palm plantation. Wildlife species that can be found around the river include saltwater crocodile, false gharial, Proboscis monkey, Celebes crested macaque, and maroon leaf monkey. People who have logging activities, including for <i>Gluta renghas</i> , around the swamp are usually those who live in Pulau Lanting
PT PBJ Employee	Yos	Guide; Discussion	Presence of Pris Swamp & freshwater swamp forest.

#### *Land cover verification and forest inventory*

Land cover is verified through two methods, i.e. visual field verification to observe dominant species and canopy stratification (Congalton and Green, 2009) and biomass measurement using sample plots (Bakker *et al.*, 2009).

Number of samples for visual land cover observation is 50 for each land cover class identified, while number of samples for biomass measurement is set through experiment design method taking into account the Aboveground Biomass (“AGB”) carbon amount deviation standard variables for each land cover class. There are 90 samples for forest inventorying plot (Figure 11) including medium-density secondary lowland forest (37 spots), low-density secondary lowland forest (24 spots), thicket (18 spots) and bush (11 spots).

Sample locations for each land cover class are distributed through several approaches including purposive sampling, stratified random sampling and cluster sampling. Vegetation is inventoried at each sampling location using line plot. Each plot in the line consists of four measurement sub-plots (Figure 12), each of which is used to measure trees classified by the diameter class, i.e. 1 x 1 m<sup>2</sup> plot (Diameter at Breast Height (DBH) 2-10 cm), 5 x 5 m<sup>2</sup> plot (DBH 5-10 cm), 10 x 10 m<sup>2</sup> plot (DBH 10-20 cm), and 20 x 20 m<sup>2</sup> plot (DBH > 20 cm).

Biomass carbon is estimated using carbon fraction value against biomass of 0.47 (IPCC, 2006). Data on the DBH and tree species resulted from vegetation inventorying is converted into biomass values through allometric equation. Use of allometric model refers to compilation of allometric models from a variety of research outputs in Indonesia, i.e. Guide to Use of Allometric Models for Estimating Forest Biomass and Carbon Stock in Indonesia (Forestry Research and Development Agency Head Regulation No. P.01/VIII-P3KR/2012).

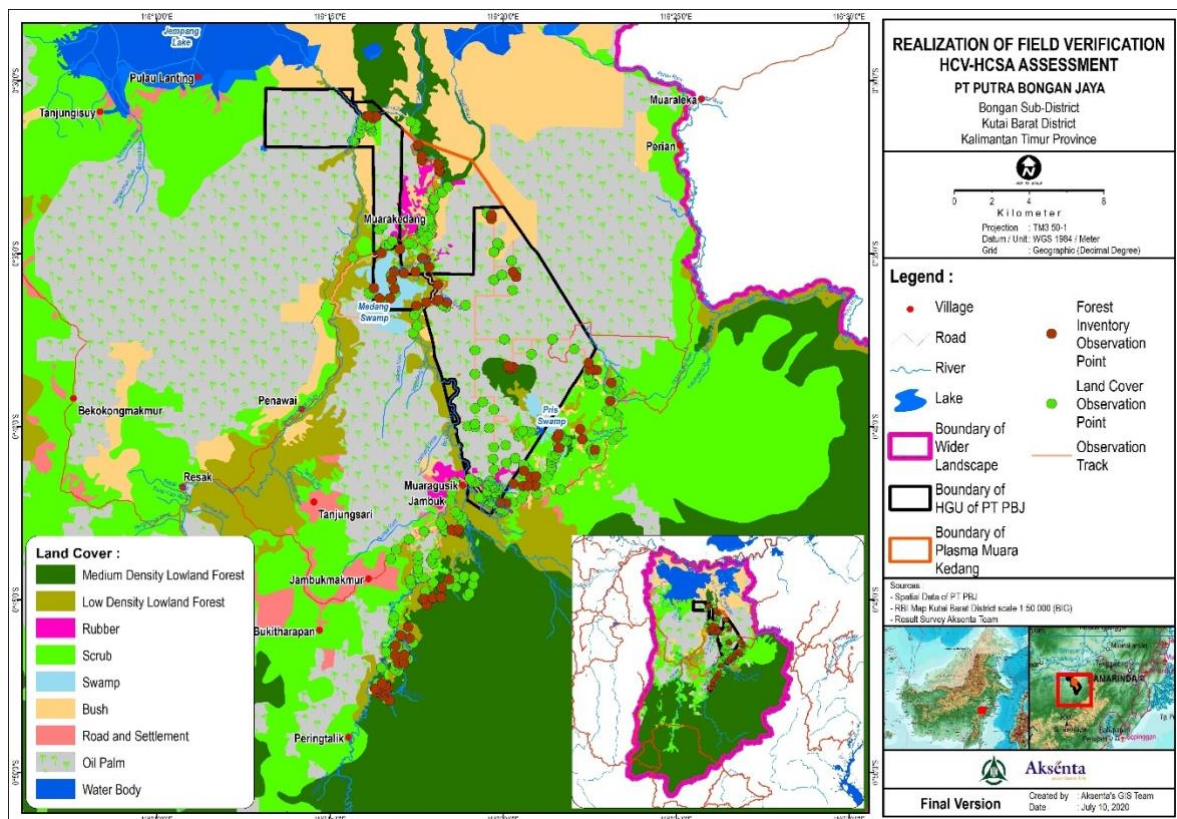
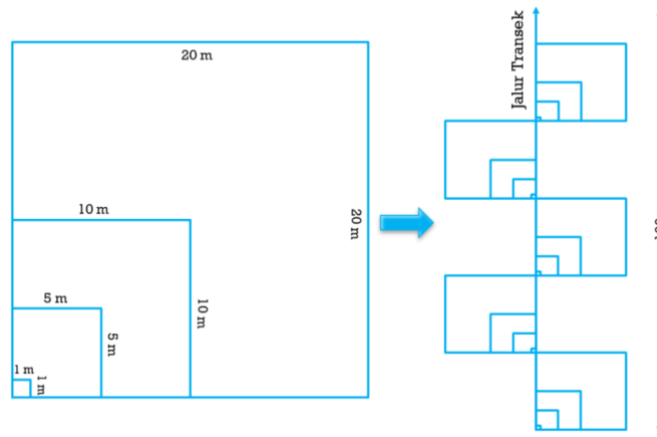


Figure 11. Map of forest inventory sampling locations



**Figure 12.** Forms of line plots and sub-plots in each plot used in the Assessment

### *HCV 1, HCV 2, HCV 3*

HCV 1-3 assessment aims to identify which areas are of important values in biological context. HCV 1 identification method employs data collection techniques as follow.

- i) Exploration is opportunistic where all flora and fauna species data is collected along the line of field survey and verification activity.
- ii) Line transect is combined with point count, where mammal and bird species as well as plant data is specifically collected with distance of 200-400 m between point counts.
- iii) Plant species are inventoried by placing 50 m-diameter circular observation plots and 20x100 m<sup>2</sup> profile diagram plots. The data from this activity is accompanied by inventorying data collected by the forest inventory team.
- iv) Interview with local community members regarding the presence of wildlife species and threats they face in the assessment area.

Wildlife and plant species observation focus refers to the presence of Rare, Threatened and Endemic (RTE) or restricted-range species specified under the applicable laws. IUCN and CITES.

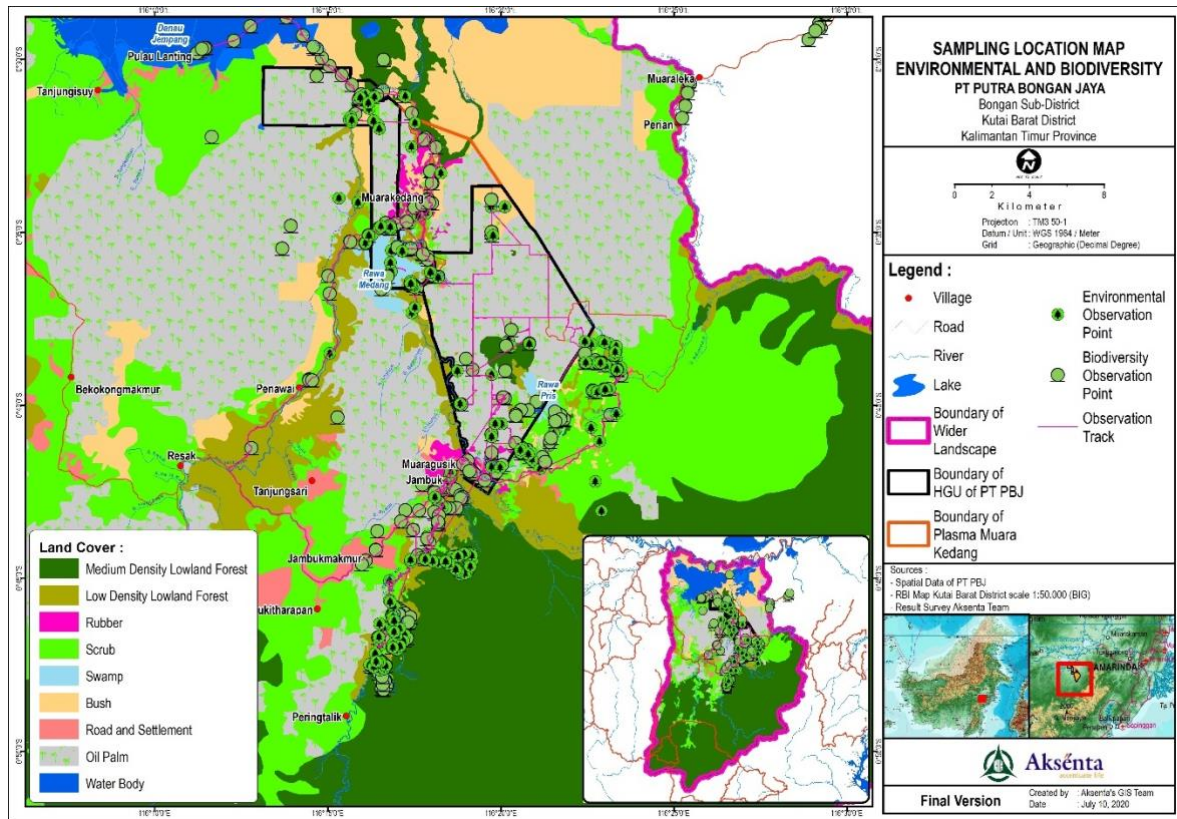
Method used for identifying HCV 2 combines spatial analysis and qualitative observation. Using GIS and remote sensing techniques, spatial analysis is carried out to identify the position of the assessment area against any IFL or conservation areas, or others with natural ecosystem within or around it. Several conditions are observed, focusing on: i) the presence of natural ecosystems; ii) verification of natural ecosystem in the context of the wider landscape; and iii) verification of connectivity between a potential area and two or more large landscapes. If any smaller natural ecosystems are found providing key functions to landscape (e.g. connectivity and buffering), the area in question will be considered an HCV 2 area.

HCV 3 is identified through combination of spatial analysis method and field observation. Spatial analysis method takes place applying precautionary approach following the *HCV Toolkit for Indonesia* (Consortium for Revision of the HCV Toolkit for Indonesia, 2008). Precautionary Approach is applied through: (i) mapping of ecosystem types in the entire AoI based on land system map; (ii) determination of threatened and rare ecosystem types; (iii) overlaying maps of threatened and/or rare ecosystem types with maps of the remaining natural vegetation obtained from field observations and land cover interpretation based on the Forest Inventory and HCS team analysis. The analysis final output is naturally vegetated areas on threatened/rare ecosystems containing HCV 3.

This environmental HCV assessment also involves analysis and observation of hydrological conditions in the assessment area and its surroundings to identify the presence of HCV 4 (see also social HCVs). Groundtruthing is also carried out in areas with hydrological parameters including



river morphometry, water level, flow velocity, and vegetation cover from upstream to downstream areas, as well as swamp biophysical condition, depressed area and floodplain, presence of water sources/springs and their water discharge, land physiographic condition, and soil physical aspects relating to infiltration and erodibility.



**Figure 13.** Map of environmental HCV field survey locations

### Social HCV assessment method (full assessment)

Methods applied for approaching social HCVs include historical and descriptive-qualitative methods. Historic method is a process to critically scrutinise and analyse the past record and remains (Wibowo, 2011), while descriptive-qualitative method is a qualitative description of facts, data or material objects that are not in the form language or topics, whatever the forms it takes, instead of numbers, through a proper, systematic interpretation (Wibowo, 2011). Both methods are applied through (i) in-depth interview; (ii) participatory mapping; and (iii) field observation.

Secondary data is collected through desktop study over maps and various references relevant to the Area of Interest (“AoI”), be it from the company or other sources (**Table 10**). All of the collected information/data is correlative and mutually corrects each other to meet triangulation principles.

The assessment team applies Free, Prior and Informed Consent (“FPIC”) principle to consultation (interview/FGD) where respondents are free to either give answer or no answer, or delay giving it, for each question from the team. The team also provides respondents with complete information about HCV-HCSA, and sees if they have any question. When collecting data, respondents agree to have the interview until information is considered sufficient for the context of this HCV-HCSA Assessment. Interview and discussion involve 58 respondents from 10 communities/stakeholders

(Table 12) that include 19 representatives of Pulau Lanting Village community, 9 from Muara Kedang, 6 from Muara Gusik, 5 from Jambuk, 12 from Jambuk Makmur and 7 from Pering Taliq.<sup>15</sup>  
**Table 12.** Summary of interview and discussion in the full assessment phase

Expert/ Organisation/ Social Group	Name/Position/Role	Interaction Type	Concern and/or Recommendations concerning the HCV-HCS Assessment
Pulau Lanting Village Government and Community Leaders	<ul style="list-style-type: none"> <li>- Sulaiman, Head of BPK</li> <li>- Alpian Nur HS, Village Secretary</li> <li>- Andri Salam, Former Village Head and currently Team 11 Head</li> <li>- Kasran, Traditional Leader</li> </ul>	Participatory Mapping and Interview	<ul style="list-style-type: none"> <li>▪ Village History.</li> <li>▪ History when the company started operation in the village area.</li> <li>▪ Community livelihood.</li> <li>▪ History of the beginning of oil palm cultivation in the village.</li> <li>▪ PBJ's information dissemination has carried out in 2015</li> <li>▪ The process of compensation and social contribution from PT PBJ took place in three phases, i.e. 2016, 2017 and 2018.</li> <li>▪ No protected historical sites in PT PBJ location permit concession.</li> <li>▪ Community earns livelihood from fishing in Lake Jempang (outside the Assessment area) and working for oil palm plantations around them.</li> <li>▪ Community representatives (village head, BPK Head, Village Secretary, and traditional leader) can be consulted on the final HCV-HCS Assessment .</li> </ul>
Jambuk Village Government and Leaders	<ul style="list-style-type: none"> <li>- Hendi, Village Secretary</li> <li>- Ahwinsyah, Traditional Leader</li> </ul>	Interview and participatory mapping	<ul style="list-style-type: none"> <li>▪ History of Jambuk Village.</li> <li>▪ Community mostly earns livelihood from working for companies around them (i.e. PT Agrisinal, PT Farinda Bersaudara and PT PBJ), while the rest of them still rely on rubber.</li> <li>▪ Jambuk Village community shares a history of poor relationship with PT Farinda Bersaudara regarding MoU for land clearing and compensation, making them cautious when dealing with PT PBJ</li> <li>▪ In the past, Jambuk Village was once the largest durian producing area, but in 1997 a devastating fire broke out and consumed trees including durian.</li> <li>▪ As many as 80% of Jambuk Village community members can accept the presence of PT PBJ</li> <li>▪ A gentle reminder that as an independent assessor team, Aksenta works can be accessed by community through village officials</li> </ul>
Muara Gusik Village Government and Leaders	<ul style="list-style-type: none"> <li>- H Herman, Muara Gusik Village Head/Official</li> <li>- Majemi, Muara Gusik Traditional Leader</li> </ul>	Interview and Participatory Mapping	<ul style="list-style-type: none"> <li>▪ Providing information about the presence of several sacred cultural heritages, but most of them are outside the Assessment area</li> <li>▪ To earn livelihood, community used to gather rattan, practice dry farming, tap rubber, fish, and hunt. Hunting activities stopped when rabies plague broke out in 1979.</li> <li>▪ Fishing activities still take place in Medang</li> </ul>

<sup>15</sup> PT PBJ MU is not located in Jambuk Makmur and Pering Taliq, but both villages are included by the scope of this social HCV-HCSA Assessment. Information necessary from Jambuk Makmur Village relates to land claim, while that from Pering Taliq is necessary to confirm village boundaries against Location Permit boundaries.

Expert/ Organisation/ Social Group	Name/Position/Role	Interaction Type	Concern and/or Recommendations concerning the HCV-HCS Assessment
			<p>swamp and River Bongnan Kiri.</p> <ul style="list-style-type: none"> <li>▪ History of oil palm started in 1987 with PT Lonsum entering to the village. In 2006-2007, PT Agrisinal came over and much helped community clear lands for oil palm, followed by and PT Farinda and PT PBJ.</li> <li>▪ Aksenta's HCV-HCS Assessment output can be accessed by community through village officials</li> <li>▪ Initially, compensation for land acquisition was only given over lands managed by the village (communal lands), not individuals.</li> <li>▪ After land acquisition from the village, claims rose out from local community members over land ownership, evidencing certain documents.</li> </ul>
Muara Kedang Village Government and Leaders	<ul style="list-style-type: none"> <li>- Abdul Gais, Village Head</li> <li>- Maniansyah, Traditional Leader</li> </ul>	Interview and participatory mapping	<ul style="list-style-type: none"> <li>▪ History report of Muara Kedang.</li> <li>▪ the following are cultural sites in Muara Kedang. <ul style="list-style-type: none"> <li>- Beranak Stone. It was once believed that every time villager delivered a baby, number of the stones would increase. Now, many stones have been taken during the hype of agate stone.</li> <li>- Tiang Mahligai (Castle Pole), a legend on a King's (Ilas Jaya) daughter who was punished by Sayus (the Ruler of Meratus) and changed into a pole</li> <li>- Angsana wood, a relic of a Chinese merchant who once lived in Muara Nusa.</li> </ul> </li> <li>▪ Traditional rituals are no longer performed in Muara Kedang, while customary fines are still imposed over certain violations, such as cutting down Menggris and Jelembu trees. Customary fines are often resolved amicably.</li> <li>▪ Fire outbreak in 1982 has destroyed rubber trees, rattan, and dry farmlands, forcing community to fish as the main livelihood. Moreover, when fire reoccurred in 1997, number of people who fished increased, not only in Muara Kedang but also other villages.</li> <li>▪ Aksenta's HCV-HCS Assessment is also necessary to Muara Kedang community, so that it is expected that the result can be accessed through the village representatives such as the Village Head, traditional or community leaders.</li> <li>▪ People used to fish in Loah Medang, particularly during wet seasons. In dry seasons they used the area for farming.</li> <li>▪ Currently, 95% of Muara Kedang community work for local companies around the Village.</li> </ul>

Sampling of community members uses purposive sampling technique. Community members selected as samples are local community members who have knowledge over the AoI and can represent the community aspiration. Based on stakeholder identification at preassessment phase, it is known that local community members who are qualified as informant in social HCV full

assessment are ‘officials’ (another term to refer to village head in West Kutai District), government representatives, traditional leaders, religious leaders, fishermen, and landowners.

Participatory Mapping (PM) and Focus Group Discussion (FGD) are carried out in big meetings. PM focuses on mapping of use and tenure of lands that are not to be converted into oil palm plantation, because they are used as the sources of subsistent and non-subsistent livelihoods, as well as other areas important for traditional and customary purposes. FGD is then held to further explore information concerning socio-economic and cultural conditions, and verify the initial FPIC process. Semi-structured interviews are conducted through small meetings, aiming to explore more of social, economic and cultural conditions, as well as natural resources control and use.

Simple mapping (sketching) is used as participatory mapping method in this Assessment, involving local community representatives. In this process, the Assessment team uses stationery, flipchart paper, digital map (satellite imagery), and Avenza Maps application to sketch maps of land tenure and use. Any natural landmarks such as hills, rivers, swamps, and lakes are used in the participatory mapping. Furthermore, if social HCV areas (HCV 4-6) are found during this activity, the Assessment team will carry out field verification by visiting the areas together with local community representatives.

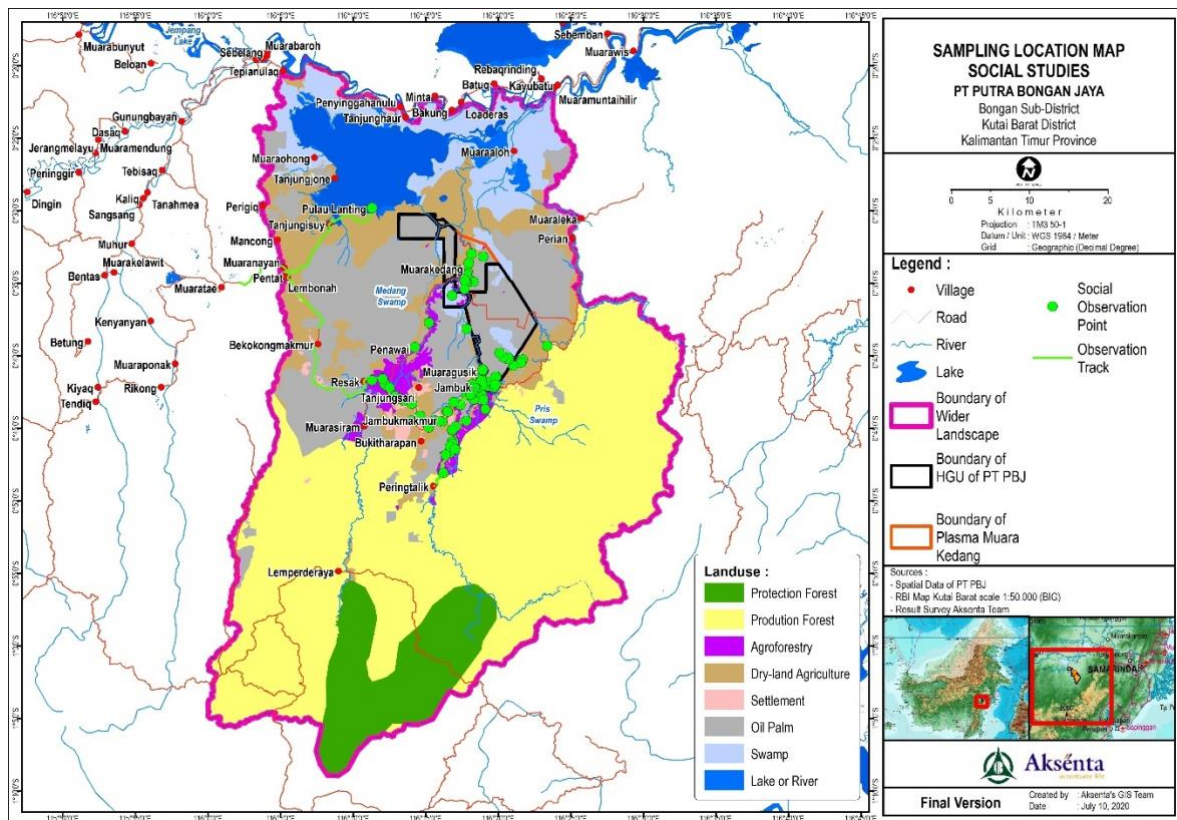


Figure 14. Map of social HCV survey locations

### 2.3. Soil and Topography Assessment

The assessment of soil and topographic is based on the existing information, mainly maps of soil type and contour lines in the both estates. The objective of this assessment is to identify fragile soil or places that need to be protected or treated more carefully. The following soil information was extracted from the CSA report. Soil and topography assessments were conducted in September 2014 by Param Agricultural Soil Surveys (M) Sdn. Bhd, whose office address is A4-3 Jalan 17/13, 46400 Petaling Jaya, Selangor, Malaysia; phone/fax: (+603) 7960 1810; email:



[passparam@yahoo.com](mailto:passparam@yahoo.com), [passparam@gmail.com](mailto:passparam@gmail.com). The distribution of the soil types is shown on the soil map. The soil series names in Malaysia (Paramanathan, 2010) are used as map symbols and put as the legend. Slope phases of the soil series are also mapped.

## 2.4. Carbon Stock and Green House Gas (GHG) Assessments

### Dates of activities

Carbon stock assessment was carried out from January to March 2019, while the Greenhouse Gas (“GHG”) assessment was from January to June 2019. Both assessments’ field surveys were conducted simultaneously with the Integrated HCV-HCSA assessment’s vegetation inventorying activity. See **Table 13** and **Table 14** for details on the activity venues and dates.

**Table 13.** Timeline of carbon stock assessment in PT PBJ MU concession

Date	Activity	Venue
19-25 January 2019	Desktop study and field activity preparation	Jakarta
27 January 2019	Team’s travel to PT PBJ plantations	Jakarta-Samarinda-Bongan
28 January 2019	Opening Meeting	PT PBJ Meeting Room
28 January – 5 February 2019	Field survey	PT PBJ MU concession
6 February 2019	Closing Meeting	PT PBJ Meeting Room
7 February 2019	Team’s travel back to Jakarta	Samarinda-Jakarta
10 February – 8 March 2019	Reporting	Jakarta
8 March – 22 March 2019	Report review and finalisation	Jakarta

**Table 14.** Implementation of GHG assessment for new planting in PT PBJ MU concession

Phase	Activity	Location	Timeline
Pre-assessment	<ul style="list-style-type: none"> <li>▪ Reviewing locations in the assessment area using GIS</li> <li>▪ Reviewing secondary data and reference.</li> </ul>	Jakarta	3-20 January 2019
Data collection	<ul style="list-style-type: none"> <li>▪ Land cover classification.</li> <li>▪ Assessment of land cover carbon stock.</li> <li>▪ Collection of data on estimate of material use in plantation and mill operation.</li> </ul>	Jakarta and the company’s operational area	28 January – 5 February 2019
Analysis and reporting	<ul style="list-style-type: none"> <li>▪ Making of land cover change scenarios using GIS.</li> <li>▪ Analysis of carbon stock and projection of GHG emission from each land cover change scenario.</li> <li>▪ Making of scenarios for mill management.</li> <li>▪ Making of projection of GHG emission from each mill management scenario.</li> </ul>	Jakarta	May-June 2019

### Assessors and Their Credentials

Carbon stock and GHG assessments are carried out by Aksenta’s team of five (**Table 15**).

**Table 15.** Carbon stock and GHG assessment team

Name	Role	Expertise
Bias Berlio Pradyatma	Analysis and estimation of GHG emission projection scenario for new plantings	Land cover carbon stock assessment, GHG emission projection, GHG emission mitigation, and GIS.
Priyo Dwi Utomo	Land cover classification and carbon stock assessment	GIS, vegetation carbon stock assessment and mapping, and land cover assessment.

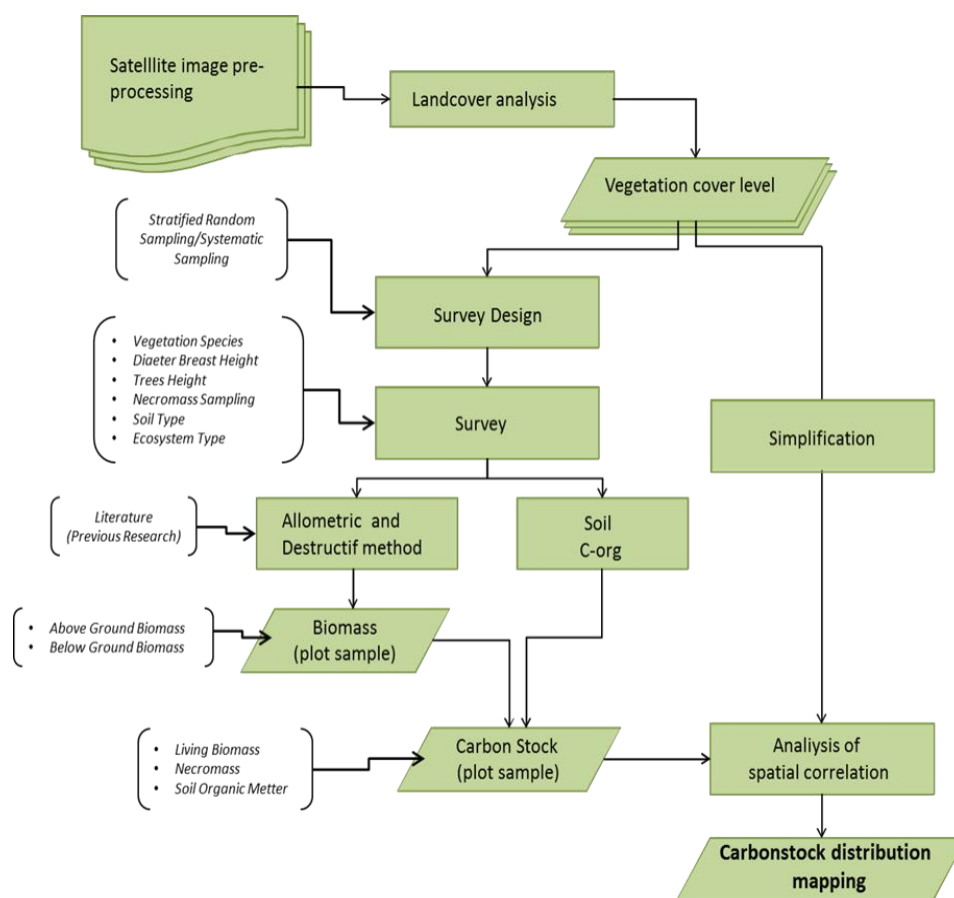


Name	Role	Expertise
Tengku Haikal		Soil survey, vegetation and soil carbon stock assessment.
Ahmad Syirojudin		Plant species identification, land cover assessment, and vegetation carbon stock assessment.
Rahmat Darmawan		Plant species identification, land cover assessment, and vegetation carbon stock assessment.

## Assessment Method

### Carbon Stock Assessment (CSA)

The assessment is conducted referring to several available standard carbon inventory guidelines, i.e. *Guidelines for National Greenhouse Gas Inventories* (IPCC, 2006), *Measurement and Calculation of Carbon Stock: Field Measurement for the assessment of forest carbon stock* (Ground-based Forest Carbon Accounting) - SNI 7724 (2011), and *RSPO GHG Assessment Procedure for New Plantings*, v.3 (30 October 2016). The flowchart of the activities and data used are presented in **Figure 15** below.



**Figure 15.** Methods and phases of carbon stock assessment in the PT PBJ MU

See the following general equation for total land or forest carbon stock value (IPCC, 2006):

$$CS = 0.47 (AGB+BGB+DTN+DWN+LN) + C-Org$$

Note:

- CS = Carbon Stock
- AGB = Aboveground Biomass
- BGB = Belowground Biomass
- DTN = Dead Tree Necromass
- DWN = Dead Wood Necromass

LN = Litter Necromass  
 C-Org = Soil Carbon Stock

Value of biomass at the level of the assessment area is assessed through biomass correlation analysis and extrapolation using Shortwave Infrared (SWIR) band. Correlation analysis is based on the value of AGB estimated at all sampling locations using spectral radiance value of channel 6 of Landsat 8 OLI TIRS satellite image. The relation between both can be represented by the coefficient of correlation (r) and determination ( $R^2$ ). Extrapolation is carried out only in estimating AGB carbon-sourced carbon value. The extrapolation output is then used to map carbon stocks sourced from BGB and necromass carbon (litter and dead wood). The local-level AGB value extrapolation uses the following empirical formula

$$CAGB = 218.54e^{-0.136SR} \implies SR > 5.32 \text{ W/m}^2\text{sr}\mu\text{m}$$

Note :

CAGB : AGB Carbon (tonne/ha),

SR : Band-6 Spectral Radiance band 6 ( $\text{Watt m}^{-2}\text{sr}^{-1}\mu\text{m}^{-1}$ )

### GHG Assessment

GHG Assessment is conducted following RSPO's GHG Assessment Procedure for New Plantings, v.3 (30 October 2016).

## 2.5. Land Use Change Analysis (LUCA)

### Dates of activities

Land Use Change Analysis ("LUCA") for new planting was carried out in January-May 2019, while field survey was on 28 January-5 February 2019, simultaneously with HCV-HCSA field assessment (full assessment). LUCA assessment for compensation liability in the HGU concession, this was carried out on 1 September-15 October 2017, and field visit was on 11-15 September 2017. LUCA for NPP has also analysed with an additional cut-off (validity < 1 year).

### Assessors and Their Credentials

LUCA and social liability assessment are carried out by Aksenta team consisting of two GIS/remote sensing experts and one social expert (**Table 16**).

**Table 16.** LUCA and Social Liability Assessment team

Name	Role	Expertise	Experience
Pramitama Bayu Saputro	GIS and remote sensing expert (NPP and compensation over the HGU concessions).	Forestry, ecological landscape, wildlife conservation, carbon stock, spatial analysis, remote sensing, and land cover change.	Country: Indonesia and Malaysia Language: Indonesian and English
Ryan Karida Pratama	GIS and remote sensing expert (compensation over the HGU concession)	Spatial analysis, land cover change, remote sensing, GIS in the HCV-HCSA assessment, and carbon stock assessment.	Country: Indonesia and Malaysia Language: Indonesian and English
Martinus Sidik Purnomo	Social liability expert	Environmental economics, social, economic and cultural aspects, social institution, assistance for cooperative, and social liability	Country: Indonesia and Malaysia Language: Indonesian and English

### Assessment Methods

## LUCA

LUCA is conducted following RSPO Remediation and Compensation Procedures (2015) which includes relevant cut-off dates to identify land clearance prior to HCV assessment and the NPP completion. LUCA for PT PBJ HGU concession has three cut-off dates (**Table 17**). In addition, one cut-off (22 October 2020) has been added in the analysis for describing the current land cover (validity < 1 year).

**Table 17.** Date of satellite image acquisition

Cut-off date	Date of image acquisition; cloud cover
	HGU concession
1 November 2005	5 June 2005; < 15% 29 April 2006; < 15%
1 December 2007	21 June 2008; < 10%
April 2009 (Date of HCV Assessment of HGU)	29 March 2009; 0%
January 1, 2010	20 September 2009; 1% 27 August 2009; 1%
May 9, 2014	<i>Irrelevant</i>
September 1, 2018 (Date of PT PBJ takeover by KLK Group)	<i>Irrelevant</i>
8 February 2019 (Date of the Integrated HCV-HCSA Assessment and groundtruthing)	19 July 2018; 5% 15 February 2019; 0%
22 October 2020 (Additional cut-off for NPP - Validaty <1 year)	22 October 2020; 15%

## Social Liability

Social liability assessment applies *Guidance on Identifying Social Liability for The Loss of HCVs 4, 5 and 6* (RSPO Biodiversity & High Conservation Values Working Group [BHCVWG], 2016). Data is collected combining the following methods: (1) Desktop study, (2) Participatory mapping, (3) In-depth interview, (4) Field observation. As many as 49 respondents are selected using purposive and snowball sampling methods, consisting of 28 local community members and 21 others from the company side.

## 2.6. FPIC Process

The company's FPIC process is verified by Aksenta team (**Table 18**) simultaneously with the HCV-HCSA assessment. The FPIC application is also verified during social liability assessment (23 January to 5 February 2019).

**Table 18.** FPIC process verification team

Name	Role	Expertise
Ali Akbar Hutzi	Social and economic expert, participatory mapping facilitator	Environmental economics, social, economic and cultural aspects, social institution, and participatory mapping
Noor Rakhmat Danumiharja	Social, economic and cultural, and stakeholder engagement expert	Social and economic aspects, social impact management, socio-cultural aspect, participatory mapping and institutional facilitation.
Martinus Sidik Purnomo	Social and economic, and social liability expert	Environmental economics, social, economic and cultural aspects, social institutions and social liability.

## Assessment Method

FPIC is verified through the following methods: (i) document review; (ii) FGD; (iii) in-depth interview; and (iv) field observation. Respondent are selected using purposive and snowball sampling methods.

### 3. Summary of Findings

#### 3.1. Social and Environmental Impact Assessment (SEIA)

##### Positive and negative environmental effects

See **Table 19** for summary of link between the affected components/parameters, along with the impact sources.

**Table 19.** Major impacts by the impacted component

Component	Major impact
<b>Geographic-Physical-Chemical Aspects</b>	
1) Deteriorating air quality	<ul style="list-style-type: none"> <li>▪ Due to oil palm processing mill's operational activities.</li> <li>▪ Based on measurement of ambient air quality (e.g. dust), it is 50 µg/NM<sup>3</sup> at project site and 32 µg/NM<sup>3</sup> at worker settlement. Based on observation, none has exceeded the environmental quality standard (230 µg/NM<sup>3</sup>) as per Government Regulation No. 41/1999.</li> <li>▪ NO<sub>2</sub> value is 24 µg/NM<sup>3</sup> at the project site plan locations and 23 µg/NM<sup>3</sup> at worker settlement. Compared to the Government Regulation No. 41/1999 (400 µg/NM<sup>3</sup>) standard, it is known that the NO<sub>2</sub> concentration is still below the maximum limit.</li> </ul>
2) Increased noise	<ul style="list-style-type: none"> <li>▪ Noise is sourced from mill construction and operation.</li> <li>▪ Noise level at the measured location (activity site plan location and worker settlement) ranges from 48 to 50 dBA. Machines commonly used in removing soils include dump truck, grader for roadwork, and loader for material loading.</li> </ul>
3) Increased erosion rate	<ul style="list-style-type: none"> <li>▪ This occurs at construction level because of land clearing activities for mill site at construction phase.</li> <li>▪ Land clearing led to changes in land cover which was previously covered with vegetation, now become cleared (1 point for C value).</li> </ul>
4) Increased sedimentation	<ul style="list-style-type: none"> <li>▪ Land clearing activities are predicted to have impacts on sediment content (increased turbidity and suspended solids), which is considered indirect negative impact as these are derivative impacts out of soil erosion.</li> </ul>
5) Deteriorating surface water quality	<ul style="list-style-type: none"> <li>▪ Impact may potentially occur on the water quality, i.e. increased pH, Total Suspended Solid (TSS), Biological Oxygen Demand (BOD) and Chemical Oxygen Demand (COD) in water.</li> </ul>
<b>Biological Aspects</b>	
1) Loss of vegetation	<ul style="list-style-type: none"> <li>▪ This is because of activities of land clearing and mill construction at construction phase.</li> </ul>
2) Disturbed aquatic biota	<ul style="list-style-type: none"> <li>▪ This is due to land clearing activity at construction phase.</li> <li>▪ Derivative impacts out of water quality change, while the change itself is derivative to increased sediment content.</li> <li>▪ Organic remains from tree felling decay in the water. This process will affect the content of Dissolved Oxygen (DO) which will lead to the disturbed aquatic ecosystem. Data indicates that the aquatic environment baseline with benthos diversity in the river in the area is 0.97-0.98.</li> </ul>
<b>Social Aspects</b>	
1) Shifted community perception and attitude	<ul style="list-style-type: none"> <li>▪ This is sourced from mill construction plan activity at construction phase and the mill's operation at the operation phase.</li> <li>▪ Baseline of the community perception and attitude is considered good as 87.0% of the community hold a good perception towards the company.</li> <li>▪ The planned construction of mill poses local community perception concerning workforce recruitment and business opportunities.</li> </ul>

Construction and operation phases are the most impactful on environmental components. Major impacts that need to be managed and monitored are as follow.

- **Construction phase**
  - 1) Activity of workforce absorption at construction phase have the following impacts on the environment.
    - a) Increased work opportunity is considered a major positive impact (+P).
    - b) Increased income is considered a major positive impact (+P).
    - c) Improved community perception and attitude are considered a major positive impact (+P).
  - 2) Land clearing and mill construction activities have the following impacts on environmental components.
    - a) Increased erosion rate is considered a major negative impact (-P).
    - b) Increased sedimentation is considered a major negative impact (-P).
    - c) Deteriorating river water quality is considered a major negative impact (-P).
    - d) Aquatic biota's disturbed abundance and diversity is considered a major negative impact (-P).
  
- **Operation phase**
  - 1) Workforce absorption activities at operation phase have the following impacts on environmental components.
    - a) Increased work opportunity is considered a major positive impact (+P).
    - b) Increased income is considered a major positive impact (+P).
    - c) Improved community perception and attitude are considered a major positive impact (+P).
    - d) Increased business opportunity is considered a major positive impact (+P).
  - 2) Mill operational and waste management activities have the following impacts on environmental components.
    - a) Deteriorating air quality is considered a major negative impact (-P).
    - b) Increased noise is considered a major negative impact (-P).
    - c) Increased toxic and hazardous waste is considered a major negative impact (-P).
    - d) Aquatic biota's disturbed abundance and diversity is considered a major negative impact (-P).
    - e) Increased work opportunity is considered a major positive impact (+P).
    - f) Increased business opportunity is considered a major positive impact (+P).
    - g) Increased income is considered a major positive impact (+P).
    - h) Improved community perception and attitude are considered a major positive impact (+P).
    - i) Disturbed public health is considered a major negative impact (-P).

The following are areas that, based on EIA, require particular attention.

- a. Riparian areas require particular attention. Based on applicable laws and regulations, such areas include protection areas or buffer zone.
- b. Protection areas or buffer zones that require particular attention include River Bongon, River Bongon Kiri, River Bongon Kanan, and Lake Peris.

### **Socio-economic impacts on the country, region and local communities**

Social analysis identifies both positive and negative impacts. The former includes community's strengthening economy because of provision of job and business opportunities and improved community's attitude and perception, while the latter includes land dispute and declining community public health due to project machinery and vehicle mobilisation. As for environmental quality, land clearing activities tend to bring about negative impacts with deteriorating surface water quality that leads to the disturbed aquatic habitat.



The SIA Review and Update output indicates that areas directly affected by the company operation include Muara Kedang, Muara Gusik, Jambuk Makmur and Pereng Taliq Villages. Individually, the impact of PT PBJ's activities on larger areas, such as East Kalimantan province and the country, is insignificant. But in the aggregate, the palm oil industry has huge implications on employment and the increase of people's income. See **Table 20** for summary of impacts of the company's operational activities on local community's asset pentagon.

**Table 20.** PT PBJ oil palm operation's social impacts on local community's asset pentagon

Community Activities	Asset Pentagon				
	Human capital	Social capital	Financial capital	Natural capital	Physical capital
Communication, social relationship and partnership	0	-	+	-	0
Permit issuance	0	-	0	0	0
Workforce absorption and management	+	0	+	0	0
Security	0	0	0	0	0
Transportation management	0	0	+	0	0
Equipment maintenance	0	0	0	0	0
Land acquisition	0	-	+	0	0
Land clearing	0	-	+	0	0
Infrastructure development	0	0	0	0	0
Nursery	+	0	+	0	0
Planting and insertion	+	0	+	0	0
Plant maintenance	+	0	+	0	0
Harvest	0	0	0	0	0
FFB transporting	0	0	+	0	-
Replanting	0	0	0	0	0

Note: (+) positive impact identified; (-) negative impact identified; (0) have zero or otherwise unidentified impact.

The company presence leads to increased financial capital from employment recruitment and partnership plantation development but may potentially also lead to the loss of local community's natural capital concerning land acquisition.

Worker recruitment brings about positive impacts with the provision of jobs to 463 people. This may have direct impacts on the increased financial capital of 20% of Bongan Sub-District population. In 2019, number of people the company hired increased to about 900 workers. Considering that this will have impact on their family members as well, it means that 26% of Bongan (and Pulau Lanting) population will be affected.

Minimum area requirements for food security is 590 ha in Pulau Lanting, 837 ha in Muara Kedang, 983 ha in Muara Gusik and 419 ha in Jambuk. Increased financial capital has positive impacts on the improved food security. The Government's prohibition of burning in land management turns out to play an important role beyond the company control and this much affects local community's food security. Land burning is a social risk to the company.

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

Social impacts, risks and issues that relate to workers constantly include occupational health and security as well as their highly diverse cultural backgrounds. In the past, dealing with these issues was not priority so that they still lingered in 2019 despite series of efforts to improve workers' condition such as worker house complex construction that followed the change in shareholding in

the company. Concerning workers, worker housing construction by the new and better company management has brought about positive impacts on their access to sources of water.

### Issues raised by stakeholders and assessor comments

See **Table 21** for detail on social issues concerning the presence of PT PBJ. Local community here refers only to the population of Muara Gusik, Muara Kedang, Jambuk and Pulau Lanting Villages.

Potential social impacts regarding major risks of human rights violation has been anticipated in 2015 SIA, responding claims over the company's HGU concession from Muara Kedang and Tanjung Isuy village community, as well as Jambuk village's rejection. In 2019, claims arose from Pulau Lanting community over the company concession while rejection of the company presence also emerged in Muara Gusik out of the company's previous management failing to keep up their promises. Resolution over matters that once was promised by the old management is also in progress to date.

**Table 21.** Social issues relevant to the company activities towards local community's pentagon assets

Company activity phase	Issue		
	Past	Present	Potential
Communication, social relations and partnership	-	<ul style="list-style-type: none"> <li>Muara Gusik Village Head rejects the company's operation because of the company's failure to keep its promises.</li> <li>Muara Kedang Village Head and leaders demand the company to keep the promises it made in the past (when it was still owned by REA Kaltim).</li> <li>In the plantation development plan, areas located in Jambuk Village is considered as HCV area, so that they cannot be cleared for plantations.</li> </ul>	<ul style="list-style-type: none"> <li>Any activity that relates to Muara Gusik Village will get impeded unless the problem because of the past promises are resolved.</li> <li>Muara Kedang Village Head will give the company a deadline by December to keep the promises. Should the company fail to keep the promises, any agreement with the company including land acquisition will be revoked.</li> <li>Social envy will emerge among Jambuk Village community.</li> </ul>
Land acquisition (tenurial issue)	Multiple claims arise over a land ownership, coming from Tanjung Isuy and Muara Kedang community members.	<ul style="list-style-type: none"> <li>Muara Gusik community finds that the issue of overlapping land ownership remains unresolved, but the land has already been cleared by the company.</li> <li>Conflict of land ownership in Pulau Lanting Village between a group of buffalo and the former village head and his staff.</li> </ul>	<ul style="list-style-type: none"> <li>Land acquisition target will be hardly be met.</li> <li>Open conflict over land in the court.</li> <li>Open conflict over land ownership between a group of buffalo and the former village head and his staff and the company.</li> </ul>
Land Clearing	-	-	Local community wishes to get involved in this activity.
Planting and insertion	-	Community would like to get involved in planting activities.	Local community would like to get involved in these activities.
Plant maintenance	-	-	Harvesters will be sent from outside the area.
FFP transportation	-	-	Use of public road for transporting FFBs will be made an issue because of the polluting road dusts and road damage.

Note: (-): there are no relevant social issues

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

PT PBJ already holds HGU concession covering an area of 11,602.33 ha since 2009. This concession is issued based on a Location Permit covering an area of 19,837 ha, issued in 2007, but later (still in 2007) was revised into 16,640 ha. PT PBJ is one of the new subsidiaries of the Indonesian KLK Group. PT PBJ was acquired by KLK in September 2018. See **Table 22** for detail on legal information on the history of the company's lands and operations.

**Table 22.** History of legality concerning PT PBJ lands and operations

Year	Permit No.	Area (ha)	Remark
2007	525.26/K.247/VI/2007	19,837	West Kutai District Head Decree, Location Reservation Permit
2007	525.26/K.1087/2007	16,640	West Kutai District Head Decree, Location Permit Revision
2009	660.5/001.4/AMDAL-VI/2009	16,640	West Kutai District Head Decree, EIA
<b>2009</b>	<b>38-HGU-BPN RI-2009</b>	<b>11,602.33</b>	<b>PT PBJ's 1<sup>st</sup> HGU certificate – Scope of NPP Stage 1</b>
2010	591/600/BPN-TU.P/VIII/2010	2,883	West Kutai District Head recommendation; land reform objects in Muara Kedang Village
2011	526.26/K.339a/2011	10,514	West Kutai District Head Decree, Plantation Business Permit
2012	525.26/K.505/2012	16,598	West Kutai District Head Decree, Revision to Plantation Business Permit
2017	525.29/K.64/2017	4,460	West Kutai District Head Decree, new Location Permit
2018	-	16,640	EIA additional provision for embankment, drainage and sluice construction
2019	660/1006/DPMPSTP-III/VIII/2019	16,640	EIA additional provision

### 3.2. High Conservation Value (HCV) – High Carbon Stock Approach (HCSA) Assessment

#### Preassessment

The result of preassessment regarding due diligence against four precondition shows in **Table 23**.

**Table 23.** Due diligence against four preconditions

Precondition	Due Diligence
1. The company has made a commitment to environmental and social safeguards.	<ul style="list-style-type: none"> <li>As one of KLK Group's subsidiaries, PT PBJ management unit is subject to and complies with any and all policies and commitments of the group, as expressed in the Sustainability Mission Statement dan Sustainability Policy.<sup>16</sup></li> </ul>
2. The company is committed to a moratorium on any land clearing or land preparation until the proposed Integrated Conservation and Land Use Plan (ICLUP) has been completed or finalised.	<ul style="list-style-type: none"> <li>The company is committed to avoiding land clearing before RSPO New Planting Procedure is met and approved by RSPO. This commitment is expressed in a written statement of moratorium wherein the company shall not clear or prepare any lands prior to ICLUP completion or finalisation once the HCV-HCSA report is declared satisfactory.</li> <li>Initial verification is carried out by interpreting September 2018-January 2019 (due diligence phase) images of Sentinel satellite. Only two cloud-free images were obtained during this period, namely September and October 2018 images. During this course, there have been found no land cover changes indicating land clearing. Interpretation of cleaner (more cloud-free) satellite images as well as groundtruthing will still be carried out in the next phases of Assessment.</li> </ul>
3. Demonstration of legal rights to or permit for exploring the	<ul style="list-style-type: none"> <li>The area in which the company runs its operation and management is divided into four: (i) HGU concession (11,602.33 ha)<sup>17</sup>; (ii) location permit concession</li> </ul>

<sup>16</sup> <https://www.klk.com.my/sustainability/market-place/sustainability-policy-and-reports/>

Precondition	Due Diligence
Area of Interest (“AoI”).	<p>(4,460 ha)<sup>18</sup>; (iii) Muara Kedang Village plasma plantation area (2,836 ha); and (iv) area planned for Muara Gusik Village plasma plantation (791.2 ha).</p> <ul style="list-style-type: none"> <li>▪ The following types of land ownership are found in the Assessment Area: (1) community-owned lands whose tenurial process took place based on the history of rotating farming activities by the previous generations and then passed down to the next generations, in addition to buying and selling process between fellow community members as evidenced with Land Statement Document (SKT) or Cultivation Statement Document (SKG); (2) village-owned lands not controlled by community through land clearing process by the previous generations and managed by the village officials.</li> <li>▪ Concerning community consent, village government as their representative has expressed their consent for the HCV-HCS Assessment implementation in their respective territory. Such community consent will be confirmed during scoping study.</li> </ul>
4. The company has initiated the FPIC process, with full disclosure of the proposed project, with all potentially affected communities, and the process for further negotiation and consent is already agreed upon, with fairly appointed representatives.	<ul style="list-style-type: none"> <li>▪ The company has initiated a Free, Prior and Informed Consent (“FPIC”) process through a series of information dissemination activities in all villages impacted by its activities and operational plan. The company has carried out these activities on: (i) 5 October 2017 with stakeholders in Muara Gusik, Jambuk, Jambuk Makmur, and Bukit Harapan; (ii) 8 December 2018 with stakeholders in Lanting Island; (iii) on 10 December 2018 with stakeholders in Muara Gusik, Jambuk and Jambuk Makmur; (iv) 9 January 2019 with stakeholders in Muara Gusik and Muara Kedung.</li> <li>▪ PT PBJ has made agreements on 23 May 2013 and 24 November 2014 with Muara Kedang community; on 26 July 2013 with Muara Gusik community; and on 23 May 2016 and 3 October 2016 with Pulau Lanting community. In the document, the communities were represented by their village government officials and leaders and community leaders.</li> <li>▪ Agreements have been made between the company and Kampung Muara Kedang Village community (23 May 2013 and 24 November 2014), Muara Gusik community (26 July 2013), and Pulau Lanting community (23 May 2016 and 3 October 2016). The company is still preparing another agreement with Jambuk Village community. Plasma plantation development agreement will follow in other separated agreements by and between the company and relevant cooperatives as community representatives. Information and documents obtained in this preassessment phase will be re-verified in the next phases of Assessment up to the full assessment.</li> <li>▪ Concerning the implementation of the Integrated HCV-HCS Assessment, the company has asked Muara Gusik, Muara Kedang, Jambuk and Pulau Lanting Village Governments for approval on 10 December 2018. In the process, the community who was represented by their village governments has expressed their written consent that can be used by the company later on for proceeding to the next phase of Assessment. The said consent/approval will be confirmed during scoping study.</li> </ul>

## Scoping Study

Scoping study result are as follow:

1. *Checking the actual condition on the ground regarding the landscape context for defining the AoI and checking the land cover type.* As many as 356 land cover sample locations are visited to verify the initial land cover classification. The identified initial land cover classes include medium-density lowland forest, low-density lowland forest, thickets, bush, barren soil and oil palm, and two additional land cover types taking form of rubber plantation and inland swamp.

<sup>17</sup> National Land Agency Head Decree No. 38-HGU-BPN RI-2009 on Issuance of HGU to PT Putra Bongang Jaya over Land in West Kutai District, East Kalimantan.

<sup>18</sup> Decree of Head of West Kutai Investation and One-Roof Integrated Service Office No. 525.29/K.64/2017 on Issuance of Location Permit to PT Putra Bongang Jaya for Oil Palm Plantation Development in Bukit Harapan, Jambuk Makmur, Jambuk and Muara Gusiq Villages of Bongang Sub-District, West Kutai, East Kalimantan.

Forest as a land cover is identified in the northern part of the MU, around Pris Swamp and in the southern part of the MU. No primary forests have been identified within the MU and the AoI, given the previous forest fires in 1997 and ongoing timber extraction activities, particularly in the southern part of the MU.

2. *Potential presence of HCV areas and HCS forests.* Area to the south of the Location Permit concession has important issues concerning potential HCV-HCS areas and plantation development plan because:
  - (i) it remains covered by forests that become habitat to important wildlife species such as Müller's gibbon (*Hylobates muelleri*), Proboscis monkey (*Nasalis larvatus*), white-fronted surili (*Presbytis frontata*), maroon leaf monkey (*Presbytis rubicunda*), southern pig-tailed macaque (*Macaca nemestrina*), and sun bear (*Helarctos malayanus*);
  - (ii) there are community fruit fields (located in Muara Gusik Village) that they will not render to the company; and
  - (iii) there are plasma oil palm plantations legally established and managed by PT Farinda Bersaudara (to the left of River Bongan).
3. *Verification of the precondition assessment output (due diligence):*
  - The company management is able to demonstrate its SOP and work instruction relating to environmental and social conservation efforts in accordance with KLK Group's commitment. Environmental and social efforts can also be seen in the field, especially in areas that currently are covered by the HGU concession (e.g. protection of riparian area, signboards to appeal and prohibit poaching activities, land burning, river poisoning, etc.
  - It has been confirmed that since PT PBJ takeover by KLK Group from REA Kaltim, the company has been absent from clearing lands for oil palm.
  - The company's legality documents are available in its operational management. Parts of community land ownership evidence and land compensation are obtained from community both directly and through village officials as their representatives
  - Muara Kedang, Muara Gusik, Jambuk and Pulau Lanting village officials have confirmed to approve the HCV-HCS Assessment upon request from PT PBJ and given permission to Aksenta team to explore their territories.
  - The confirmation on several information dissemination meetings is obtained from information from Muara Gusik, Pulau Lanting, Muara Kedang and Jambuk village communities and officials who were present in the meetings. There has also been obtained additional information that the company has conducted a follow-up information dissemination on 22 January 2019 involving stakeholders from Muara Gusik and Jambuk.
4. *Identification of key stakeholders considered to be relevant with the Integrated HCV-HCS Assessment to carry out.* The stakeholders consist village governments, community leaders, traditional leaders and other community representatives. Relevant government institutions are also listed, such as East Kalimantan BKSDA and Forestry Office. Other important stakeholders include environmental and social NGOs concerned with conservation and social issues in this area, such as The Nature Conservancy (TNC), Ecositrop, Rare Aquatic Species Indonesia (RASI) and East Kalimantan Grapesda. Initial consultation concludes that issues that should be explored more in the next phases include the relation between community and the company, presence of river as the fishing ground, presence of important species such as false gharial and proboscis monkey as well as the presence of forest cover and corridors between the remaining forests.
5. *Identification of the Assessment aspects that requires more exploration during full assessment, along with survey design to carry out. The aspects are as follow:*

- More detailed assessment on land cover and forest inventoring, particularly for areas to in the southern part of the area (Jambuk and Muara Gusik Villages) expected to have forest cover and connected to forest areas outside the Assessment area.
- Ensuring the presence of Rare, Threatened and Endangered (“RTE”) wildlife species such as Proboscis monkey (*Nasalis larvatus*) along River Bongang Kiri and false gharial (*Tomistoma schlegelii*) in Pris swamp.
- Ensuring the presence of other RTE wildlife species such as Müller's gibbon (*Hylobates muelleri*), white-fronted surili (*Presbytis frontata*), maroon leaf monkey (*Presbytis rubicunda*), southern pig-tailed macaque (*Macaca nemestrina*) and sun bear (*Helarctos malayanus*) expected to live in forest and shrub fragments.
- Checking the connectedness of the Assessment area to Lake Jempang to the north.
- Checking the presence of peat soils in the Assessment area (particularly in the eastern and northern parts) although they are, according to semi-detailed soil survey, are absent.
- Presence of rivers and swamps as fishing grounds.
- Presence of forest and shrubs that may potentially remain as HCS areas in the HGU.
- History of conflict between community and the company, that is concerned with spatial management for conservation, plantation development and community lands.
- Checking community landuse, especially in Pulau Lanting Village.

### Summary on Conservation Area

The HCV-HCSA assessment in PT PBJ concession finds five types of HCV, namely HCV 1, HCV 3, HCV 4, HCV 5 and HCV 6, as well as HCS area. Total nett conservation areas (HCV-HCS) identified within HGU concession is 2,069 ha, which is a combination of HCV areas (1,920 ha) and HCS areas (1,103.7 ha) and community lands for their future sources of livelihood (295.9 ha).<sup>19</sup> HCS areas are in overlap with several HCV areas. The conservation areas connect to others outside the assessment area (**Figure 16**). All conservation areas within PT PBJ concession become the company’s HCV Management Area (HCVMA) (see **Figure 36** in **Sub-Section 4.3**). See **Table 24** for summary of the conservation areas identified within PT PBJ HGU concession and **Table 30** for each conservation area.

**Table 24.** Recapitulation of size of conservation and management areas in PT PBJ HGU concession

Environmental and social conservation value	Size of conservation areas in the assessment area (ha)	Size of management area in the assessment area (ha)
HCS forest	1,103.74	1,103.74
Peat	-	-
HCV 1	1,835.06	1,848.24
HCV 2	-	-
HCV 3	1,835.06	1,848.24
HCV 4	1,832.41	1,850.23
HCV 5	1,005.39	1,005.39
HCV 6	0.80	0.80
Community land*	295.94	295.94
<b>Total nett area (combined)</b>	<b>2,051.23</b>	<b>2,069.04</b>

\*Total area of community land is 295.94 ha, 147.03 ha out of which is already included in the HCV-HCS area

<sup>19</sup> Overall in the management unit, total conservation area in nett is 6,213.0 ha; total HCVMA is 5,549.0 ha; total HCS area is 3,750.0 ha; and total community lands is 458.8 ha.



## HCV 1

Two out of six HCV 1 criteria are identified in the assessment area, i.e. the presence of endemic or RTE species. Areas important to biodiversity are only present in the forms of mixed Dipterocarp secondary forest, riparian forest, freshwater swamp forest, and freshwater swamp ecosystem (**Table 25** and **Figure 17**). Total HCV 1 area in PT PBJ HGU concession is 1,835.06 ha. HCV 1 area boundaries are set based on the presence and needs of key species (RTE, endemic, migrant and protected species).

**Table 25.** Indication of HCV 1 presence in the assessment area

HCV 1	Finding
Concentrations of biological diversity including endemic species, and rare, threatened or endangered species, that are significant at global, regional or national levels.	<b>Present:</b> Population of RTE and/or endemic species, including Proboscis monkey, Bornean white-bearded gibbon, sun bear, false gharial, <i>Dillenia borneensis</i> , <i>Dillenia excelsa</i> , <i>Dipterocarpus costatus</i> , <i>Dryobalanops sp.</i> , <i>Shorea parvistipulata</i> , <i>Callerya nieuwenhuisii</i> , <i>Actinodaphne borneensis</i> , <i>Alseodaphne oblanceolata</i> , <i>Endiandra elongata</i> , <i>Durio acutifolius</i> , <i>Pterandra cogniauxii</i> , <i>Artocarpus longifolius</i> , <i>Ficus midotis</i> , <i>Adinandra collina</i> , and <i>Endocomia rufirachis</i> . <b>Potential:</b> - <b>Absent:</b> -
Situations that qualify as HCV 1	Indication in the Assessment Area
A high overall species richness, diversity or uniqueness.	<b>Absent.</b> Some parts of the Assessment area have already turned into oil palm plantations. The actual condition indicates that only few locations allow the good presence of biodiversity, i.e. a forest area to the south of PT PBJ concession, riparian zones of Bongan Kiri, Bongan Kanan, Bontok, and Bongan Tongkok, as well as freshwater swamp forests in Pris and Medang swamps.
Populations of multiple endemic or RTE species.	<b>Present.</b> RTE species (Proboscis monkey, Bornean white-bearded gibbon and white-fronted surili) and endemic species (maroon leaf monkey, dusky munia, and Borneo skink). Other RTE species include Asian small-clawed otter, deer, lesser adjutant, false gharial and Amboina box turtle.
Important populations or a great abundance of individual endemic or RTE species.	<b>Absent.</b> There has been recorded endemic and/or RTE species, but with low population.
Small populations of individual endemic or RTE species, in cases where the national, regional or global survival of that species is critically dependent on the area in question.	<b>Present.</b> There has been recorded small populations of Proboscis monkey, Bornean white-bearded gibbon and false gharial, as well as small populations of <i>Dillenia borneensis</i> , <i>Dillenia excelsa</i> , <i>Dipterocarpus costatus</i> , <i>Dryobalanops sp.</i> , <i>Shorea parvistipulata</i> , <i>Callerya nieuwenhuisii</i> , <i>Actinodaphne borneensis</i> , <i>Alseodaphne oblanceolata</i> , <i>Endiandra elongata</i> , <i>Durio acutifolius</i> , <i>Pterandra cogniauxii</i> , <i>Artocarpus longifolius</i> , <i>Ficus midotis</i> , <i>Adinandra collina</i> , and <i>Endocomia rufirachis</i> . During data collection, there has been recorded at least 5 groups of Proboscis monkey, most of which (3 groups) populate riparian habitats by River Bongan Tongkok, while others by Rivers Bongan and Bongan Kiri.
Sites with significant RTE species richness.	<b>Absent.</b> RTE species are not concentrated in one single location, but distributed in several locations in the Assessment area.
Particularly important genetic variants, subspecies or varieties.	<b>Absent.</b> The Assessment area is not part of important genetic species distribution area.

## HCV 2

Base on analysis of landscape maps and groundtruthing, it is concluded that no HCV 2 area is found in the Assessment area because the area is mostly already in the form of cultivation area dominated by oil palm plantation (**Table 26**). Natural ecosystems or their mosaics that are of significant landscape value are no longer found in this area. Parts of ecosystems that play the role as corridor or buffer to the remaining areas around the MU also can no longer be found either.

**Table 26.** Indication of HCV 2 presence in the assessment area

HCV 2	Findings
Large landscape-level ecosystems and ecosystem mosaics that are significant at global, regional or national levels, and that contain viable populations of the great majority of the naturally occurring species in natural patterns of distribution and abundance.	<b>Present:</b> - <b>Potential:</b> - <b>Absent:</b> There are no IFL around the Assessment area. The area is bordered by a Production Forest that has undergone a timber extraction, making it no longer an intact forest. In addition, road access is already available in the forest area.
Situations that qualify as HCV 2	Indication in the Assessment Area
Large areas (e.g. could be greater than 50,000 ha, but this is not a rule) that are relatively far from human settlement, roads or other access.	<b>Absent.</b> Parts of the Assessment area are farmlands with settlements, other developed area and road access around.
Smaller areas that provide key landscape functions such as connectivity and buffering.	<b>Absent.</b> There is a natural forest in the southern and central parts of the Assessment area (Pris swamp) that has no functions of connectivity to or buffering with other natural forests or centre of biodiversity around it.
Large areas that are more natural and intact than most other such areas.	<b>Absent.</b> There are no areas that are more natural or intact than their surroundings. The remaining forest in the southern part of the MU already has a completely open access. Logging activities take place year-round with moderately high intensity.

### HCV 3

Landscape assessment and land system map (RePPPRoT, 1990) verification indicate the presence of four types of ecosystem in the AoI, listed as threatened ecosystem by HCV Toolkit Indonesia (2008; Table 8.3.2). They are (i) lowland/hilly mixed dipterocarp forest on sedimentary rock; (ii) riparian forest; (iii) freshwater swamp; and (iv) peat swamp.

Three out of four types of ecosystem found in the AoI are situated within PT PBJ MU concession and identified as HCV 3, i.e. lowland/hilly mixed dipterocarp forest on sedimentary rock, riparian forest and freshwater forest. Mixed dipterocarp forest ecosystem is found in the western part of the concession, while riparian forest ecosystem in Bongan Tongkok, Bontok, and Bongan Kiri riparian areas, and freshwater swamp ecosystem in Pris and Medang swamp as well as the most parts of riparian areas in the northern part of the concession (**Figure 18**). Total HCV 3 area in PT PBJ HGU concession is 1,835.06 ha.

The boundaries of HCV area designation are divided into two groups, i.e. i) for forest-characterised ecosystem type, HCV area boundaries are the outermost of stands of medium and low-density secondary forests (natural vegetation cover); and ii) for water body-characterised ecosystem type, HCV area boundaries are permanently inundated swamp area whose land cover is medium-density secondary forest, low-density secondary forest, thicket, bush and open water body. Based on the boundary designation, all of the remaining natural vegetation cover types (including secondary forest, thicket and bush) in swamp ecosystem are designated as the inseparable part to the freshwater swamp ecosystems containing HCV 3.

### HCV 4

Areas of hydrological functions and other ecosystem services are found in all of the rivers and their riparian areas, as well as freshwater swamp, freshwater swamp forest and lowland forest. Total size of HCV 4 area and potential HCV 4 area within PT PBJ concession is 1,832.41 ha. Some of them are connected to other HCV 4 areas outside the concession (**Table 27** and **Figure 19**). Riparian buffer zones are set using the approach of important functions and values in the riparian areas, referring to *RSPO Manual on Best Management Practices (BMPs) for the Management and Rehabilitation of Riparian Reserves* (Barclay et al., 2017), *Simplified Guide Management and Rehabilitation of Riparian Reserve* (Lucey et al., 2018), and *Riparian Buffers: A Livestock Best Management Practice for Protecting Water Quality* (Gumbert et al., 2009).

**Table 27.** Indication of HCV 4 presence in the assessment area

HCV 4	Assessment Area
Basic ecosystem services in critical situations, including protection of water catchments and control of erosion of vulnerable soils and slopes.	<b>Present:</b> Areas with important hydrological functions and ecosystem service value take form of rivers/streams and their riverbanks, freshwater swamp, freshwater swamp forest and lowland forest. <b>Potential:</b> Riparian areas that are now oil palm plantations.
Situations that Qualify as HCV 4	Indication in the Assessment Area
Managing extreme flow events, including vegetated riparian buffer zones or intact floodplains.	<b>Present.</b> The presence of rivers, freshwater swamps and their riparian forests, and non-permanent backswamp that remains with key elements and roles in managing flood events (among others, Rivers Bongan, Bongan Kanan, Bongan Kiri, Bongan Tongkok, Piungan, Prodan, Drungan, Sri Bongkok, Arung, Gusik, Kilun and Tuai. Freshwater swamps include Medang and Pris swamps. Non-permanent backswamp is found behind Muara Kedang Village. <b>Potential:</b> Riparian areas that are now oil palm plantations.
Maintaining downstream flow regimes.	<b>Present.</b> A lowland forest in the southern part that belong to upstream part of several tributaries of Bongan and freshwater swamp forest have function to maintain the downstream flow regimes. <b>Potential:</b> Riparian areas that are now oil palm plantations.
Maintaining water quality characteristics.	<b>Present.</b> Presence of forested, naturally vegetated riparian areas may function to maintain water quality. Almost all rivers have natural vegetation. <b>Potential:</b> Riparian areas that are now oil palm plantations.
Fire prevention and protection.	<b>Present.</b> Large wetland forests such as Pris swamp as well as Medang swamp's forest and bush. <b>Potential:</b> Riparian areas that are now oil palm plantations.
Protection of vulnerable soils, aquifers and fisheries.	<b>Present.</b> Pris and Medang swamp forests become fish spawning ground and where they gather during dry seasons.
Provision of clean water, for example where local communities depend on natural rivers and springs for drinking water	<b>Present.</b> Rivers passing through community settlement, such as Bongan Kiri and Gusik, are still used to meet community needs for clean water.
Natural ecosystems that play an important role in stabilising steep slopes.	<b>Present.</b> Comprising (i) lowland forest at the southern part that lies on a rolling ground surface prone to erosion; and (ii) riparian forest in the riverbanks that stabilises riverbank slope/edge from the risks of morphoerosion or landslide.
Protection against winds, and the regulation of humidity, rainfall and other climatic elements.	<b>Present.</b> Riparian forests in the riverbanks function to stabilise microclimate in riparian ecosystems. <b>Potential:</b> Riparian areas that are now oil palm plantations.
Pollination services	<b>Present.</b> There are mixed dipterocarp lowland forests that become habitat to bees as pollinator.

## HCV 5

The following are areas identified as HCV 5 areas (**Table 28** and **Figure 20**):

- Medang swamp, and Rivers Bongan Kiri and Bongan Kanan that community uses as their fishing ground. Bongan Kanan is also sourced by Local Government's Drinking Water Enterprise (PDAM) to produce clean water to distribute to communities in Muara Gusik and Jambuk.
- Pris swamp. Muara Gusik and Muara Kedang communities use this swamp for fishing. As for Lake Jempang, this is used as fishing ground by Pulau Lanting community

- Muara Kedang Village has two community lands. Their owners maintain their ownership for their sources of livelihood. *First* is H. Apon's land (5.6 ha) in the form of rubber plantation and shrub and *second*, Maniansyah family's land (70.4 ha) planted with rubber trees.

**Table 28.** Indication of HCV 5 presence in the assessment area

HCV 5	Finding
Sites and resources fundamental for satisfying the basic necessities of local communities or indigenous peoples (for livelihoods, health, nutrition, water, etc...), identified through engagement with these communities or indigenous peoples.	<b>Present:</b> There are rivers used by local community as their fishing ground and source of clean water through processing by Local Water Supply Enterprise (PDAM)
<b>Situations that qualify as HCV 5</b>	<b>Indication in the Assessment Area</b>
Hunting and trapping grounds (for game, skin and furs).	<b>Absent.</b> There are no community who hunts and gathers.
Non-Timber Forest Products (NTFP) such as nuts, berries, mushrooms medicinal plants, rattan	<b>Present.</b> There are uses of NTFP in forest areas, i.e. for natural fruits.
Fuel for household cooking, lighting and heating	<b>Absent.</b> The majority of community is already used to Liquid Petroleum Gas (LPG) and community's independent electricity network.
Fish (as essential sources of proteins) and other freshwater species relied on by local communities	<b>Present.</b> Many people from Pulau Lanting, Muara Gusik and Jambuk fish to meet their needs for protein.
Building materials (poles, thatching, timber)	<b>Absent.</b> Local buildings are mostly already made of materials easily accessed in local markets.
Fodder for livestock and seasonal grazing	<b>Absent.</b> There are no permanent or nomadic herders.
Water sources necessary for drinking water and sanitation	<b>Present.</b> River Bongan Kiri is used as source of clean water and sanitation through processing facility built by District Government (PDAM).
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.	<b>Absent.</b> Community is already capable of accumulating their wealth and earning income from rubber, oil palm, fish and, few of them, rice.

## HCV 6

Objects that have been identified as eligible for HCV 6 are those with important historical values to local community (**Table 29**). These objects are no longer of sacred values due to Islam's strong influence that forbids rituals of the past. However, to them these must be maintained as an evidence of history that once took place in their villages. The identified include sacred burial grounds and sites (**Figure 21** and **Figure 22**), with a total area 0.8 ha.

**Table 29.** Indication of HCV 6 presence in the assessment area

HCV 6	Finding
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.	<b>Present:</b> There are sites of historical and cultural values, i.e. ancestor's burial ground and individual tombs based on local religious stories, namely Bogeq Tomb, Syahrul Tomb, Raminja Tomb, Banyak Cemetery, Mas'ud bin Abdul Ghani Tomb and Malela Cemetery, in addition to other non-burial ground objects such as Lamin Penjiwan, Lamin Banyak, Angsana Tree, and Beranak Stone. <b>Potential:</b> Lamin Jangang <b>Absent:</b> -
<b>Situations that qualify as HCV 6</b>	<b>Indication in the Assessment Area</b>
Sites recognised as having high cultural value within national policy and legislation.	<b>Absent.</b> All of the identified HCV 6 sites are only based on local community's information.

HCV 6	Finding
Sites with official designation by national government and/or an international agency like UNESCO.	<b>Absent.</b>
Sites recognised as having high cultural value within national policy and legislation.	<b>Present.</b> Bogeq Tomb, Syahrul Tomb, Raminja Tomb, Banyak Cemetery, Mas'ud bin Abdul Ghani Tomb and Malela Cemetery, in addition to other non-burial ground objects such as Lamin Penjiwan, Lamin Banyak, Angsana Tree, Beranak Stone and Lamin Jangang.
Religious or sacred sites, burial grounds or sites at which traditional ceremonies take place that have importance to local or indigenous people.	<b>Absent.</b> All of the identified sites are no longer held sacred and used for traditional ceremonies.
Plant or animal resources with totemic values or used in traditional ceremonies.	<b>Present.</b> The Assessment location is an area of the endemic hornbills that are still traditionally and culturally honoured by Dayak peoples.

### Local community lands and future food security

There are 2 villages in PT PBJ MU concession, that have spare lands for meeting community needs for food, i.e. Muara Kedang (682.5 ha) and Muara Gusik (444.2 ha) as can be seen in **Figure 23** and **Figure 24**. The community lands which are located within HGU concession cover 295.94 ha, of which 147.03 ha is overlap with HCV-HCS area. In general, community still has spare lands of 592.1 ha in Pulau Lanting, 5,927.3 ha in Muara Kedang, 2,415.7 ha in Muara Gusik, and 629.0 ha in Jambuk. Given the availability of the potential lands, the needs for lands of 0.5 ha per person in the four villages in the assessment area can be met.

### HCS

Two HCS cover classes have average carbon value of respectively 7.2 tonne-C/ha and 43 tonne-C/ha. The intact, significantly large HCS areas within the AoI boundaries (wider landscape) are located to the southeast (a production forest area) and other forest areas in Bongan Kanan upstream area (**Figure 24**). Several HCS forest patches are in overlap with other conservation areas including HCV areas and community lands. Two low priority patches with no connectivity to conservation areas are make potential development areas.

All of the HCS forest patches and conservation areas in community lands are excluded from management and plantation development plans. Total area of the community lands is 295.94 ha (2.6%), while the proposed conservation area is 1,780.66 ha (15.3%) and oil palm-planted area is 8,743.72 ha (75.4%).

### Peat

Based on semi-detailed soil survey study (Param, 2014; **Figure 25** in **Sub-Section 3.3**) and HCV-HCS groundtruthing, it is known that there are no peatlands in the PT PBJ MU concession. Soils in the eastern part of the area are those formed from fluvial process with the parent material is alluvium and having undergone organic matter enrichment, while others in the southern part are mineral soils. KHG Map (Ministry of Environment and Forestry, 2017) indicates that within the AoI but outside PT PBJ MU there are peatlands (see **Figure 5** in **Sub-Section 1.2**) which are part of River Jempang-Kedangpahu KHG. This way, it can be concluded that there are no peatland conservation areas within the company MU concession.



**Table 30.** ID of map of HCV/HCS and HCVMA areas in PT PBJ HGU concession and in the PT PBJ Management Unit

ID	Name	HGU Area (ha)		New Location Permit or Smallholders Area (ha)		Total of PT PBJ Management Unit (ha)		Type of HCV/HCS
		HCV	HCVMA	HCV	HCVMA	HCV	HCVMA	
1	River Bongan Tongkok and its riparian area	72,5	77,6	-	-	72,5	77,6	1; 3; 4; HCS
2	River Bongkok and its riparian area, and rengas forest	60,0	60,9	-	-	60,0	60,9	1; 3; 4; HCS
3	River Bongan and its riparian area	-	-	384,9	394,8	384,9	394,8	1; 3; 4; 5; HCS
3a	Waterlogged, rubber plantation	-	-	80,3	80,3	80,3	80,3	4; 5
4	River Bongan Kanan and its riparian area	28,2	28,2	62,5	62,5	90,7	90,7	1; 3; 4; HCS
5	Medang swamp shrub and Medang swamp	724,9	724,9	158,1	158,1	883,0	883,0	1; 3; 4; 5; HCS
6	River Bongan Kiri and its riparian area	40,8	40,8	83,6	83,6	124,4	124,4	1; 3; 4; 5; HCS
7	River Piungan and its riparian area	38,1	39,1	-	-	38,1	39,1	1; 3; 4; HCS
7a	Mixed garden	5,8	5,8	-	-	5,8	5,8	5; HCS
8	River Bongan Kiri and its riparian area	117,1	124,2	-	-	117,1	124,2	1; 3; 4; HCS
9	River Prodan and its riparian area	2,8	5,5	3,0	3,4	5,8	8,9	4
10	Pris swamp and Pris swamp forest	714,5	714,5	543,2	543,2	1,257,7	1,257,7	1; 3; 4; HCS
11	River Drungan and its riparian area	-	-	26,3	26,3	26,3	26,3	3; 4; HCS
12	River Sri Bongkok and its riparian area	-	1,0	46,6	47,9	46,6	48,9	3; 4; HCS
13	River Arung and its riparian area	39,4	39,4	33,9	33,9	73,3	73,3	1; 3; 4; HCS
14	Fruit garden	58,0	58,0	198,2	198,2	256,3	256,3	5; HCS
15	River Gusik, Tuai and Kilun, as well as and their riparian areas	-	-	115,3	115,3	115,3	115,3	1; 3; 4; HCS
16	Gusik – Jambuk lowland forest	-	-	1,055,4	1,055,4	1,055,4	1,055,4	1; 3; 4; HCS
17	River Bongan Kiri and its riparian area (between Gusik and Peringtalik)	-	-	326,9	332,3	326,9	332,3	1; 3; 4; 5; HCS
18	River Meliau and its riparian area	-	-	83,2	83,2	83,2	83,2	1; 3; 4; HCS
19	Jambuk – Peringtalik lowland forest	-	-	410,7	410,7	410,7	410,7	1; 3; 4; HCS
M1	Lamin Jangang*****	-	-	-	-	-	-	6
M2	Beranak Stone***	-	-	-	-	-	-	6
M3	Banyak Cemetery*****	-	-	-	-	-	-	6

ID	Name	HGU Area (ha)		New Location Permit or Smallholders Area (ha)		Total of PT PBJ Management Unit (ha)		Type of HCV/HCS
		HCV	HCVMA	HCV	HCVMA	HCV	HCVMA	
M4	Lamin Penjiwan****	-	-	-	-	-	-	6
M5	Lamin Banyak*****	-	-	-	-	-	-	6
M7	Bogeq Sacred Tomb*	-	-	-	-	-	-	6
M8	Mas'ud Bin Abdul Gani Sacred Tomb**	-	-	-	-	-	-	6
M9	Syahrul Gunung Nusa Sacred Tomb***	-	-	-	-	-	-	6
M10	Angsana Tree***	-	-	-	-	-	-	6
M11	Castle Pole ( <i>Tiang Mahligay</i> )***	-	-	-	-	-	-	6
M12	Burial ground and Lamin of Dapuk*****	-	-	-	-	-	-	6
M13	Burial ground and Lamin of Malela*****	-	-	-	-	-	-	6
M14	Lamin Raminja*****	-	-	-	-	-	-	6
<b>Total area of PT PBJ HCV/HCVMA (ha)</b>		<b>1,902,1</b>	<b>1,920,0</b>	<b>3,612,0</b>	<b>3,629,0</b>	<b>5,514,1</b>	<b>5,549,0</b>	
<b>Total conservation area (ha; plus community land and HCS)</b>		<b>2,051.2</b>	<b>2,069.0</b>	<b>4,125.1</b>	<b>4,142.1</b>	<b>6,175.0</b>	<b>6,213.0</b>	
<b>Total area of PT PBJ Management Unit (ha)</b>		<b>11,618,2</b>		<b>8,068,0</b>		<b>19,686,2</b>		
<b>% Area of HCV-HCS</b>		<b>17.7</b>	<b>17.8</b>	<b>51.1</b>	<b>52.3</b>	<b>31.7</b>	<b>31.9</b>	

Note: Scope of NPP Stage 1 is HGU Concession; Scope of HCV-HCSA Assessment is the total of PT PBJ Management Unit

\*In overlap with ID 3 (outside HGU concession), \*\* In overlap with ID 4, \*\*\* In overlap with ID 6, \*\*\*\* In overlap with ID 8, \*\*\*\*\* In overlap with ID 15 (outside HGU concession), \*\*\*\*\* In overlap with ID 17 (outside HGU concession)

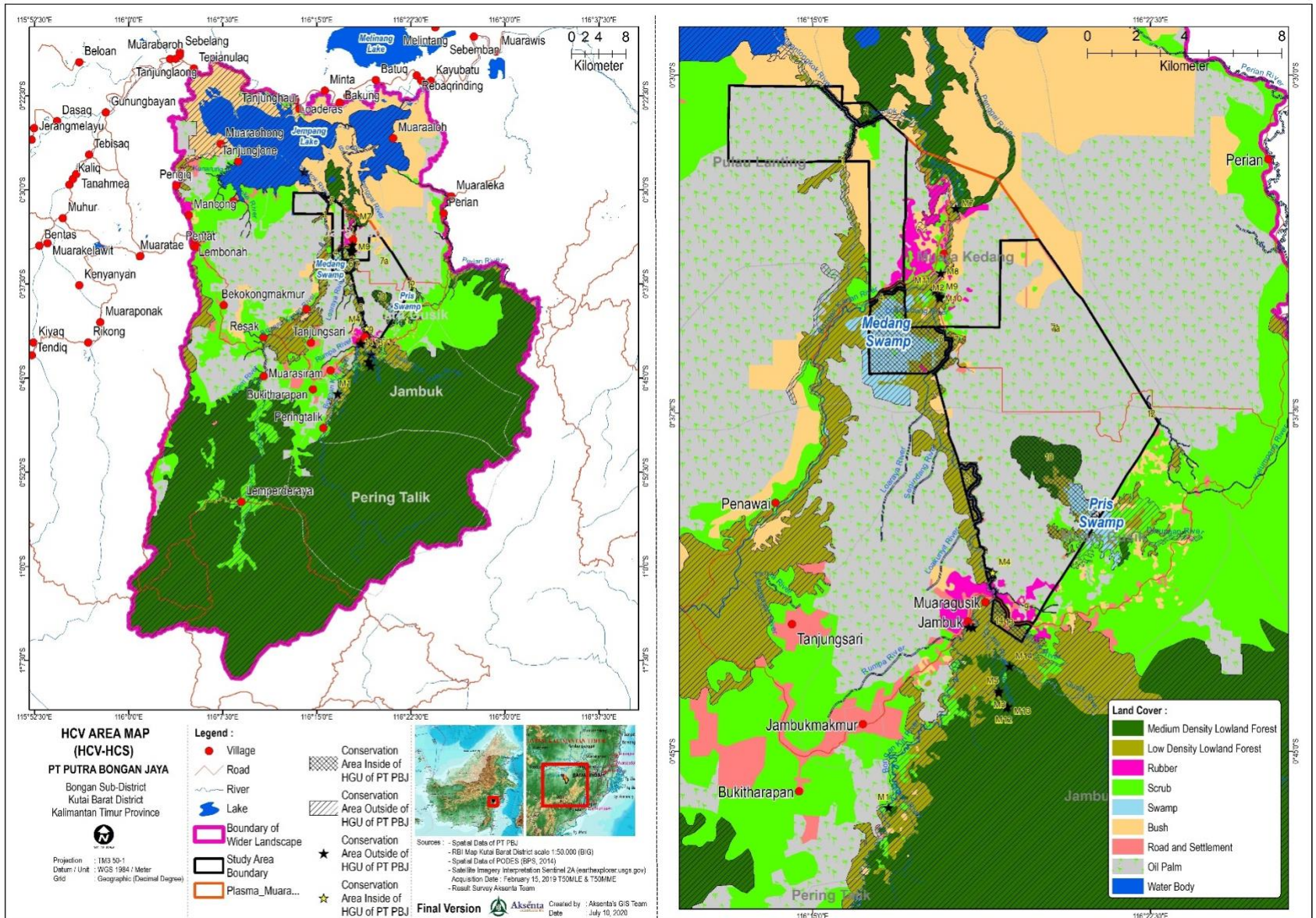


Figure 16. Map of summary of the proposed conservation areas (HCV-HCS) in PT PBJ HGU concession and its surroundings



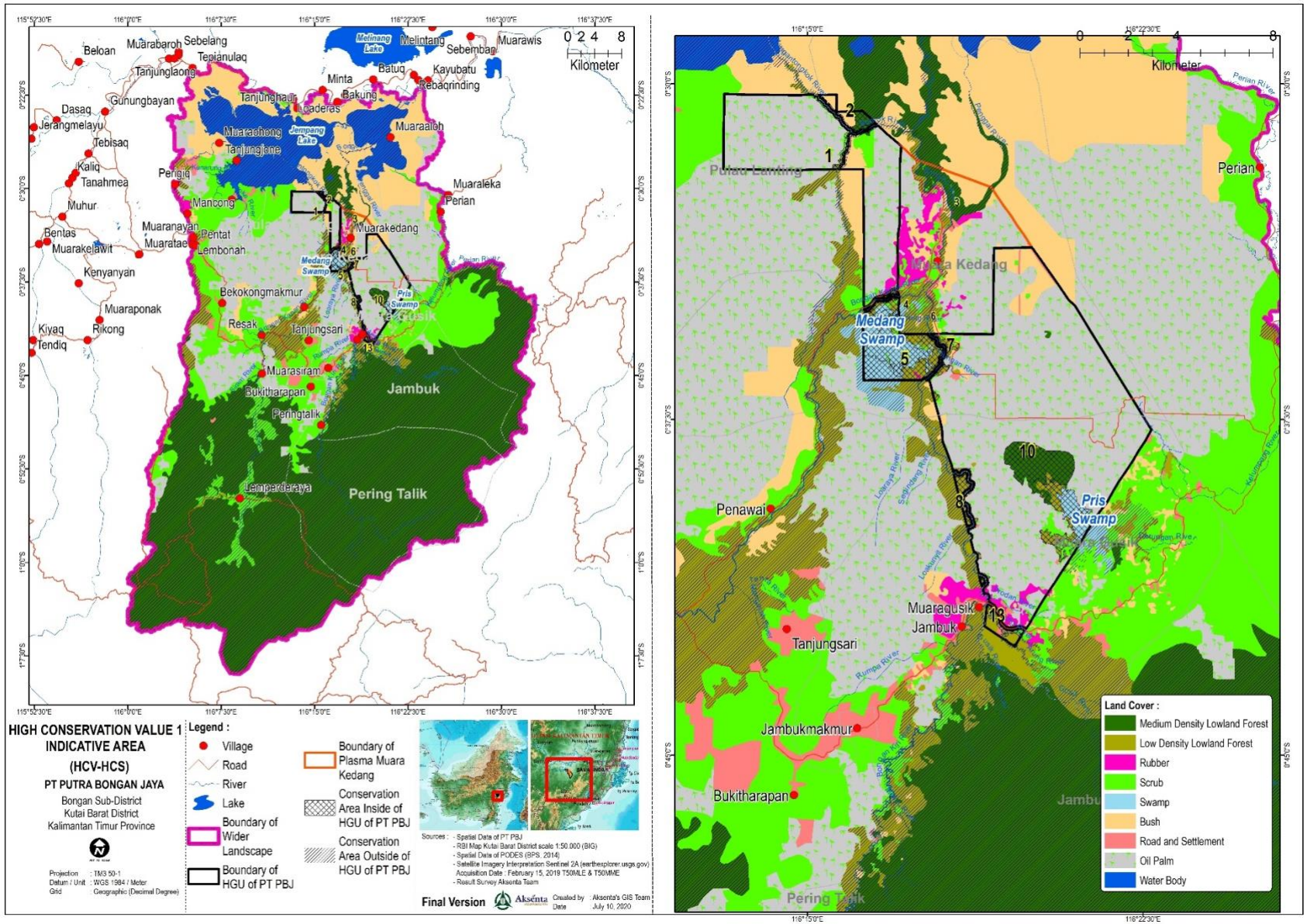


Figure 17. HCV 1 area in the PT PBJ HGU concession



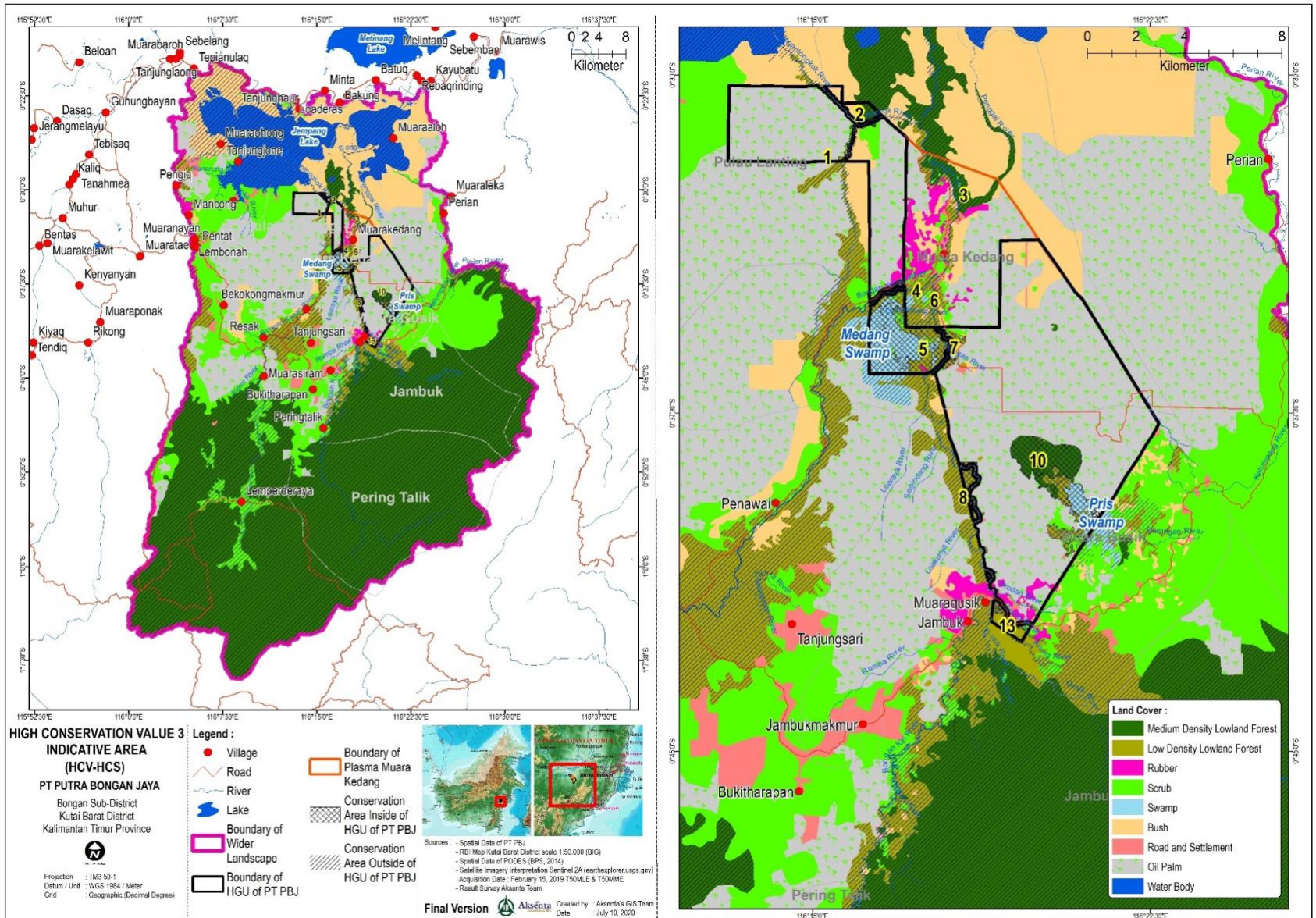


Figure 18. HCV 3 area in the PT PBJ HGU concession



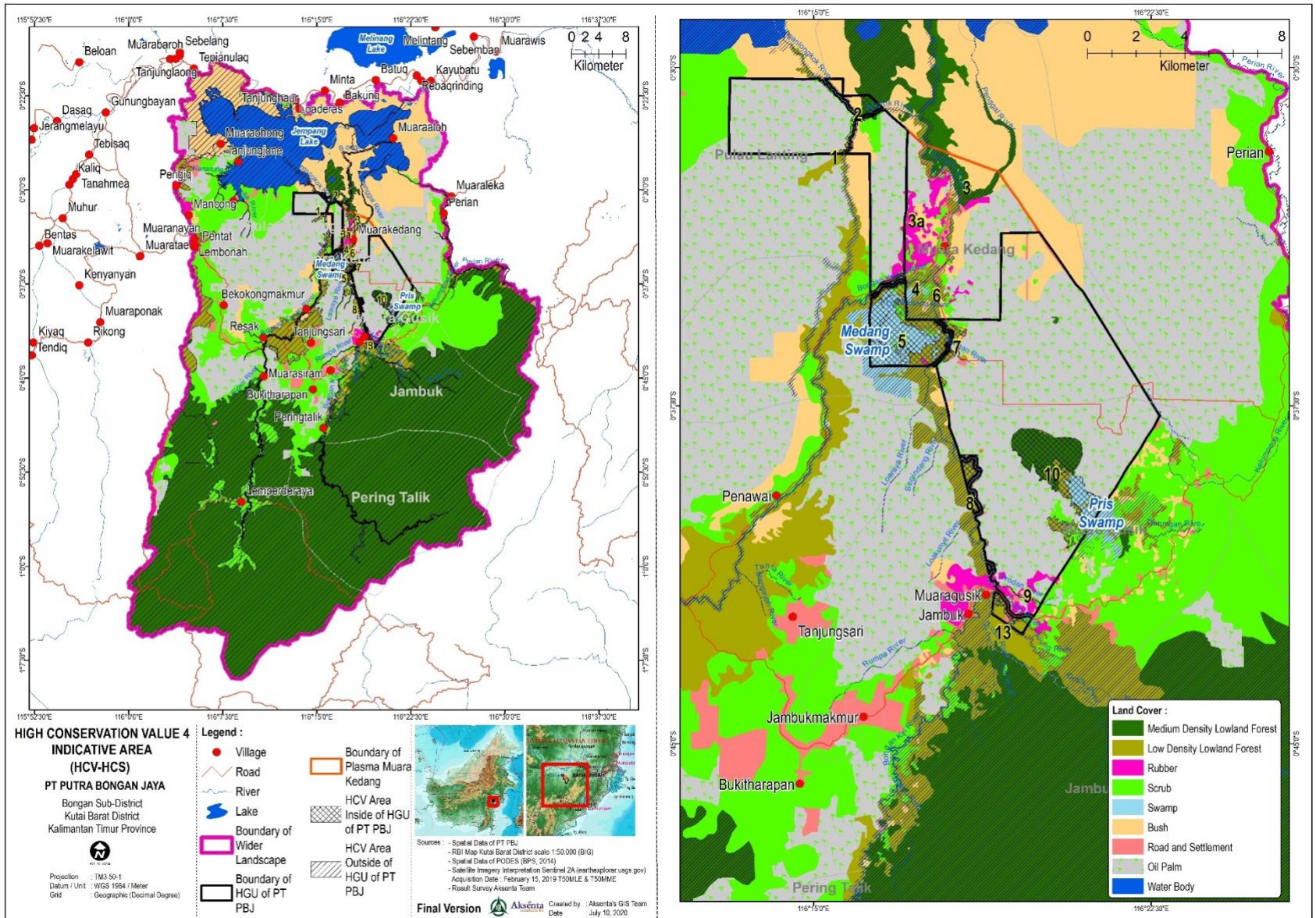


Figure 19. HCV 4 area in the PT PBJ HGU concession



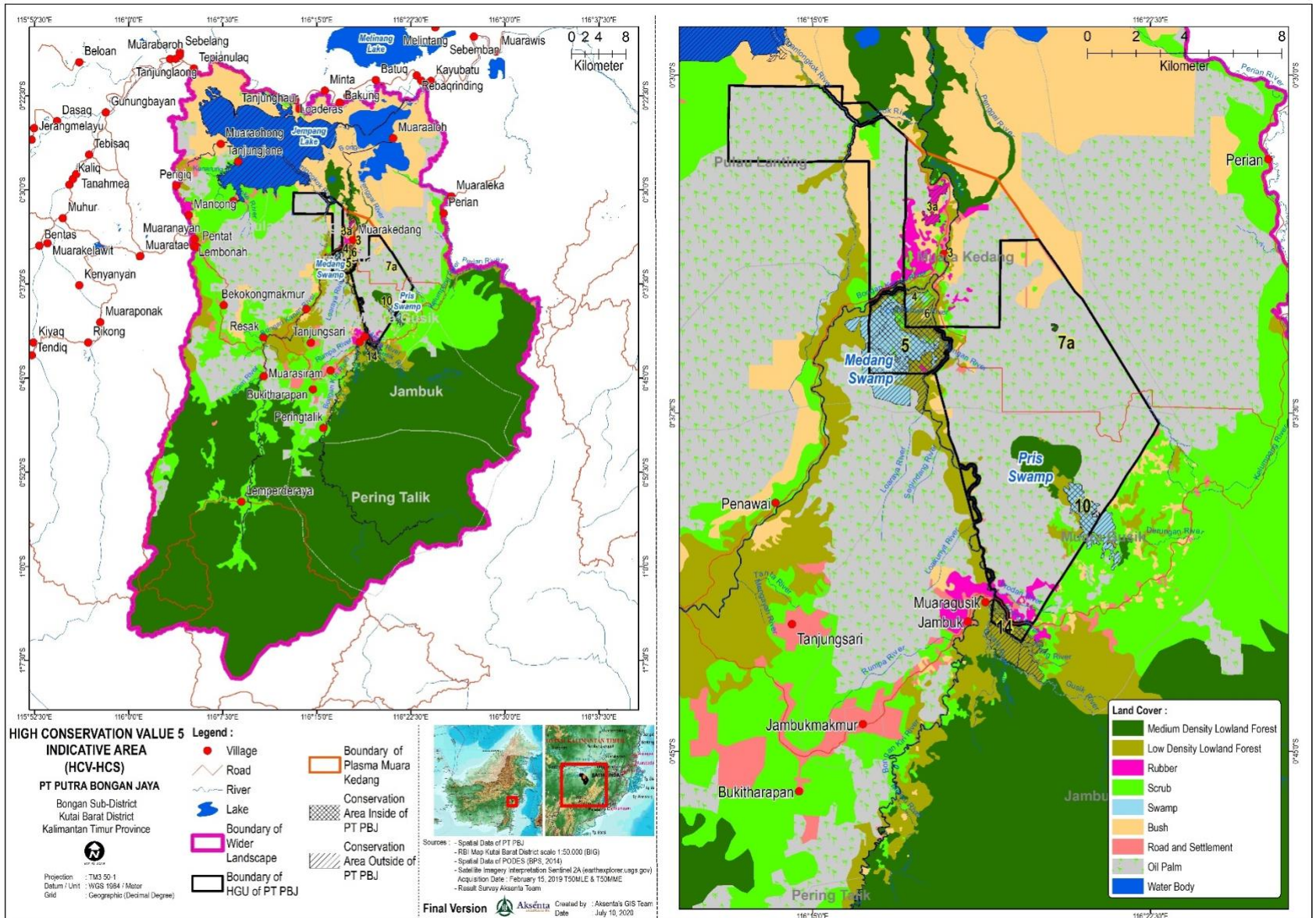


Figure 20. HCV 5 area in the PT PBJ HGU concession



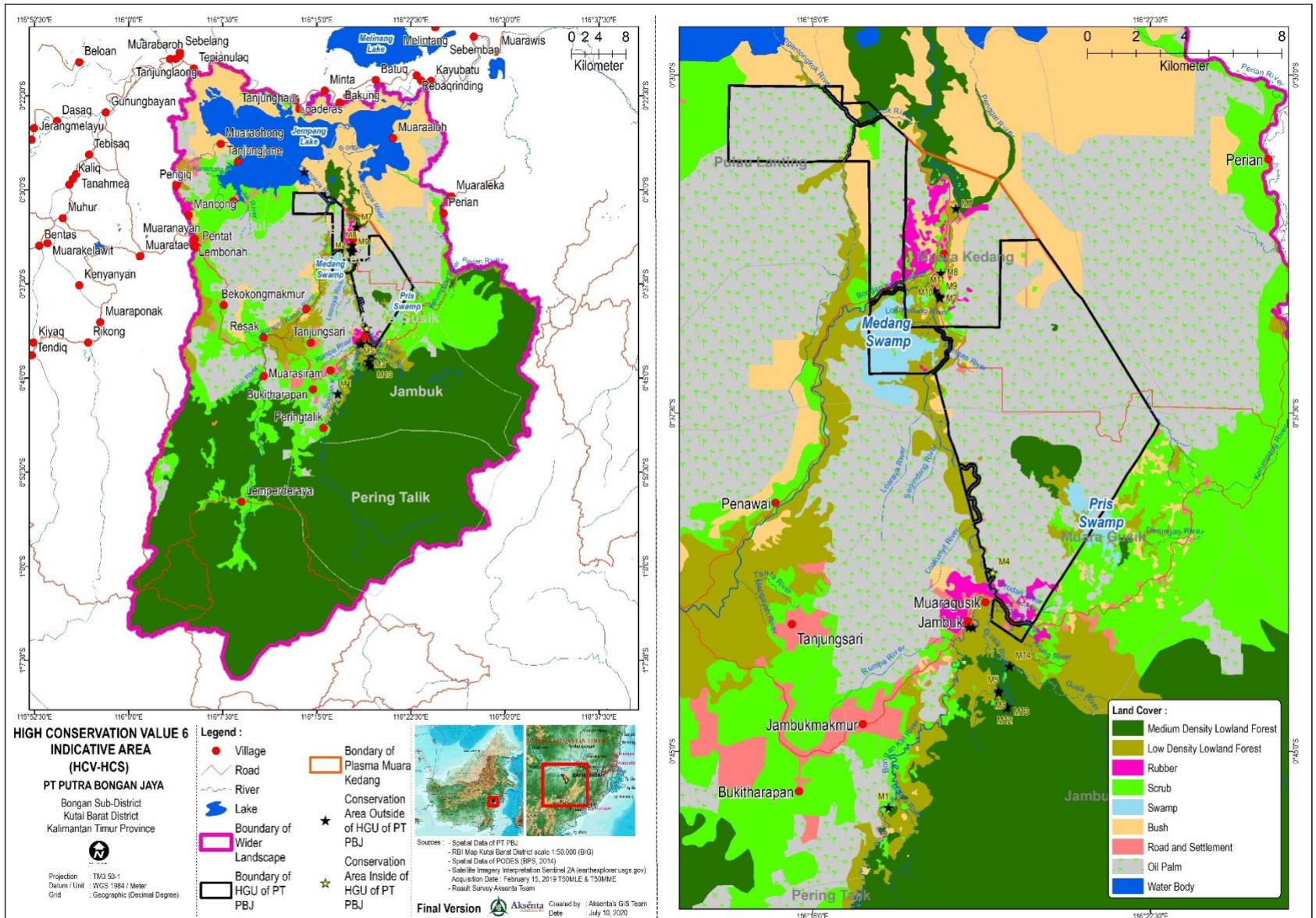


Figure 21. HCV 6 area in the PT PBJ HGU concession

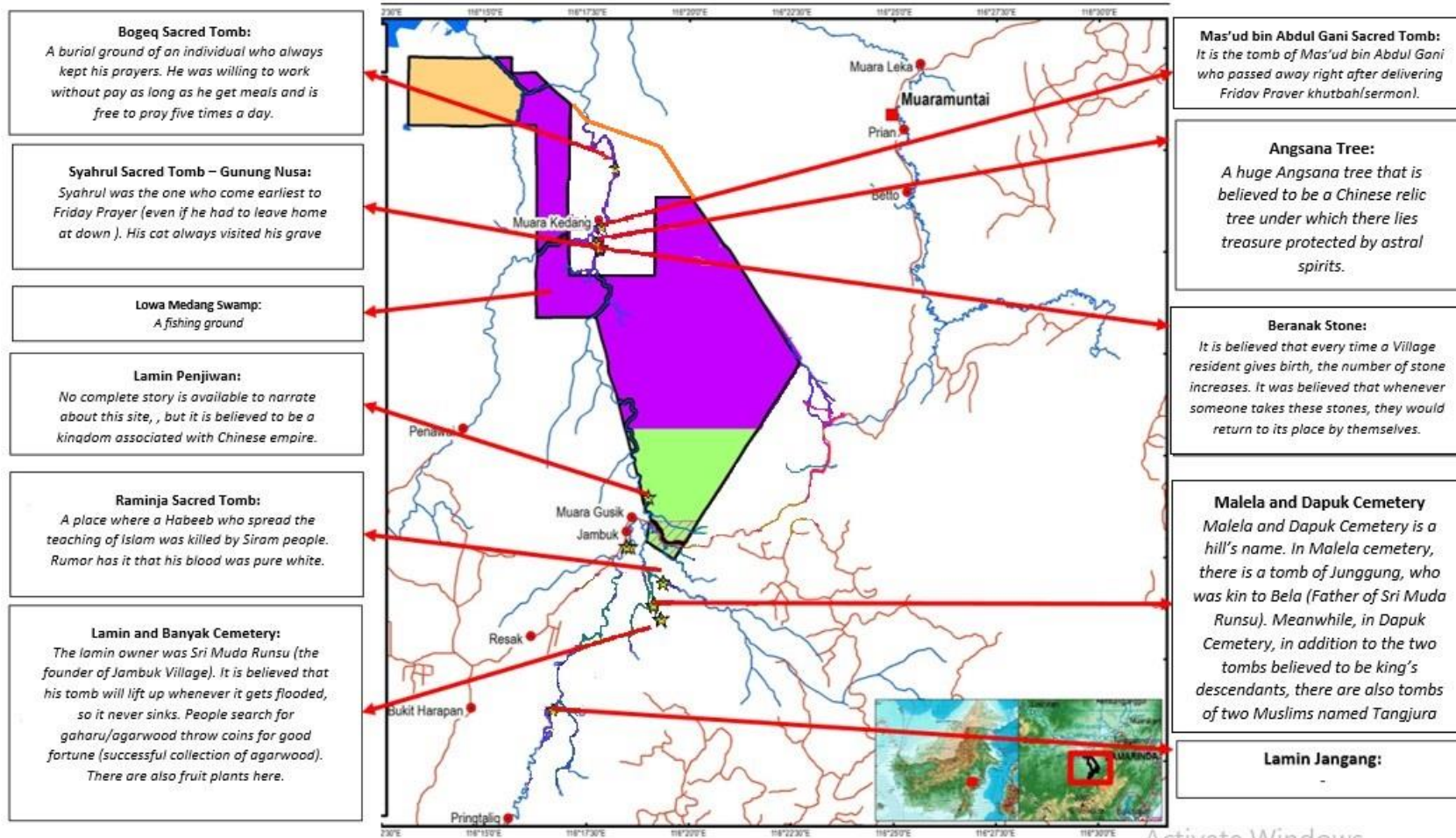
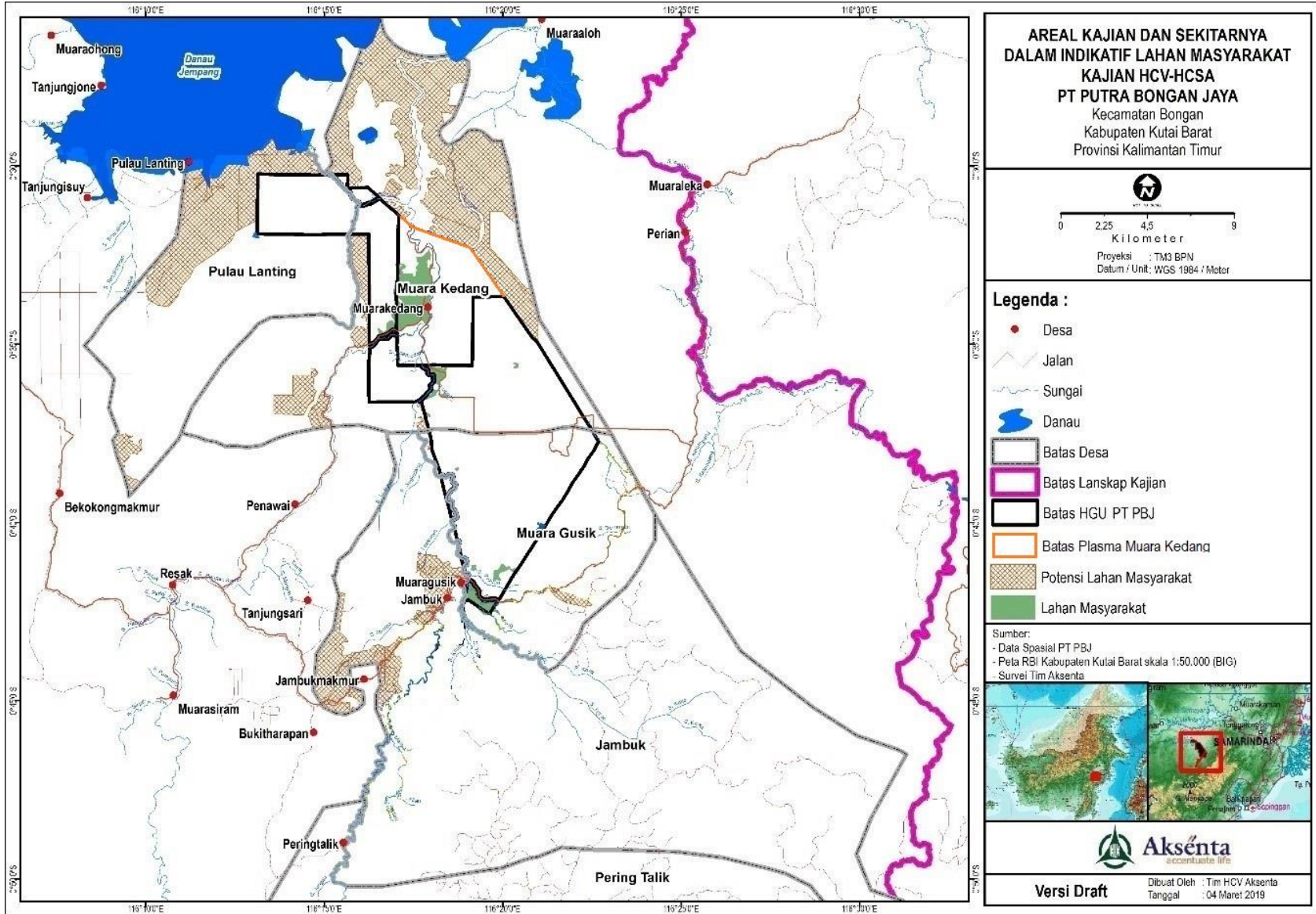


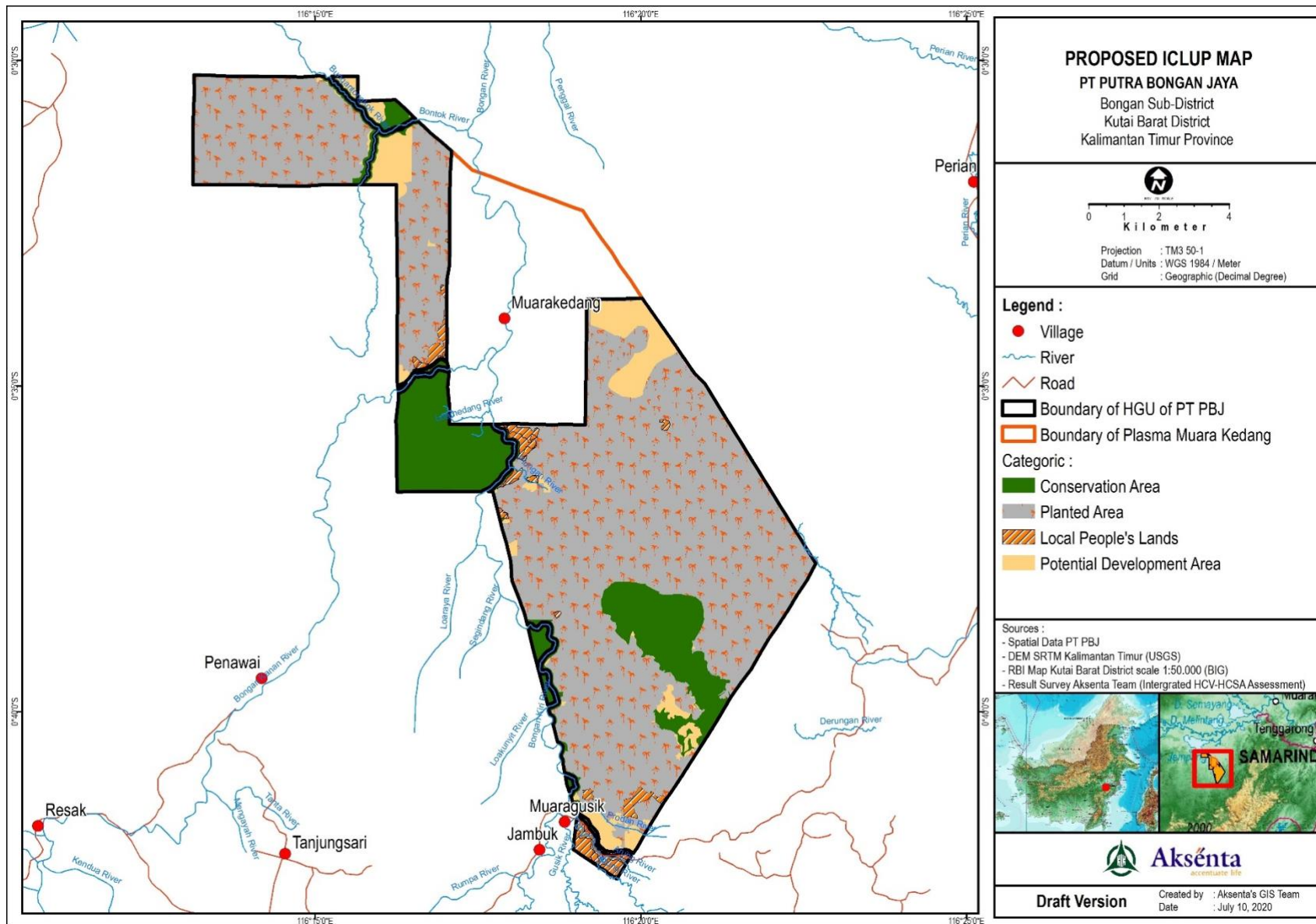
Figure 22. Information of each HCV 6 area in PT PBJ's MU





**Figure 23.** Location of community lands that are reserved within the PT PBJ HGU concession and the potential for community land that can be a reserve for community food security outside the PT PBJ concession within the AOI (village boundaries based on Podes - BPS 2014)





**Figure 24.** Map of the proposed Integrated Conservation and Land Use Plan (ICLUP) in PT PBJ HGU concession

## Final (Stakeholder) Consultation

Final consultation on the study results with stakeholders was carried out through formal meetings, informal meetings and personal communication. The material presented in the public consultation was a draft of PT PBJ's Integrated HCV-HCSA study. The final consultation was attended by community representatives consisting of village officials or officials representing them, sub-district officials and officials from the Agriculture and Plantation Office of Kabupaten Kutai Barat.

### *Individual Consultation with BKSDA*

Activity: Consultation on the Assessment Result	Consultation Participant: Yoyok (East Kalimantan BKSDA)
Venue: Sari Rasa Meeting Room, City of Samarinda	
Date: Monday/15 July 2019	
Time: 02.00-05.00 p.m.	
<p><b>Recommendation on important species-based management</b></p> <ul style="list-style-type: none"> <li>- Important flora and fauna species (RTE and Protected) found in the Assessment area are important to manage. However, the proposed management plan should also be made to the company's capacity and ability.</li> <li>- In principle, a management plan should be practicable so that the company will be able to implement it. It should also be effective to reach the objectives.</li> <li>- Priority scale to species that must be protected can be applied. Flagship/umbrella/key species can be selected as the management focus/priority and success indicator.</li> <li>- Selecting priority species in the management should take into account the covering of other species. For example, management of Proboscis monkey and its habitats directly and indirectly also covers management and protection for other species, riparian habitat, and riparian area function as an ecosystem service provider.</li> <li>- Species that we can recommend by far is Proboscis monkey because, based on map, its habitat in the Assessment area faces potential pressures from many factors including plantation management, settlement and farming activities in riparian areas. It is recommended that its habitats management be made focus of fauna biodiversity management that directly and indirectly also includes other flora and fauna species habitats in riparian areas, riparian habitats, riparian ecosystems and riparian ecosystem services and rivers.</li> </ul> <p><b>Recommendation concerning collaborative management:</b></p> <ul style="list-style-type: none"> <li>- Proboscis monkey habitats in Bongan Kiri riparian area are subject to the neighbouring company's operation and farming and settlements of communities of several villages. Consequently, the management should be collaborative.</li> <li>- As an addition to the previous description, a collaborative management also concerns with authorities over territories passed through by the rivers and their riparian areas, particularly those situated outside the company's operational area. Adopting riparian and river conservation management under the applicable regulations and traditional sanctioning system is also something that can be explored, given farming in riparian areas is one of the pressures towards these areas</li> <li>- Other than traditional rules, a collaboration with local governments can also be opted as an alternative to deal with management responsibilities of companies operating in the Assessment area (e.g. villages or sub-district).</li> </ul> <p><b>Recommendation on reference and review of the identified species' protection statuses:</b></p> <ul style="list-style-type: none"> <li>- Refer to Minister of Environment and Forestry Regulation No. 106/2018 for checking flora and fauna species protection statuses.</li> </ul>	

### *Individual consultation with Ecositrop*

Activity: Consultation on the Assessment Result	Consultation Participant: Miftah (Ecositrop)
Venue: Ecositrop Office, City of Samarinda	
Date: Monday/ 17 July 2019	
Time: 10.00-11.30 a.m.	

#### Information on areas around the Assessment area

- Q: Is the Assessment area located in Kutai Kartanegara or West Kutai Districts?  
A: The Assessment area (PT PBJ) is located in West Kutai, particularly near the borders between West Kutai and Kutai Kartanegara
- Mt. Meratus and Mt. Beratus were once the location of orangutan release.
- There is Sinarmas' Industrial Forest Plantation (HTI) concession in West Kutai, in which orangutan population is found.
- In the Assessment area, rengas wood is also harvested, such as in River Seluang area, Kutai Kartanegara District.

#### Recommendation/comment for conservation management

- The proposed management of reserve with seasonal fish harvesting regulation is an excellent idea. We call it 'Sasi'.
- Make sure that source of water and fish are made HCV 5 in the Assessment area.
- Species-based management with priority scale should be effective. However, the priority scaling for the species identified should be accurate. You can apply flagship species concept. For an example, if orangutan is found in a location, it can be used as the flagship species.
- Home ranges of Proboscis monkey and Müller's gibbon (important species found in the Assessment area) normally also include agricultural areas so long as these areas have their source of food. Therefore, it is extremely important to manage these species. For example, create SOP for workers when encountering these species.
- Corridor and stepping stone concepts can also be applied and is excellent for cultivation areas because of Müller's gibbon and Proboscis monkey have large home ranges and are adaptive to plantations and settlements. Take into account the connectivity to their core habitats.
- We once found a group of Müller's gibbons in valleys/depression situated in an industrial area in Bontang.
- We would recommend that the conservation areas as their main habitat be design in a compact way to avoid the tendency of small, isolated habitats.

#### Group consultation

Activity: Consultation on the Assessment Result	Consultation Participant:
Venue: Bongan Sub-District Office	1. F. Setianus (Head of Plantation Department – West Kutai Agriculture Office).
Date: Tuesday / 16 July 2019	2. I Putu Hendrawan (Bongan Sub-District Secretary).
Time: 10.00-13.00	3. Abdul Gais (Muara Kedang Village Head).
	4. H. Herman A. (Muara Gusik Village Head).
	5. Andry Salam S.Pd. (Pulau Lanting community leader).
	6. Saimi (Muara Kedang community leader)
<b>1. F. Setianus (Head of Plantation Department – West Kutai Agriculture Office)</b>	
- Recommendation: HCV-HCS Assessment consultation should also involve other 6 OPDs because their operational scopes also overlap with the HCV-HCS Assessment scope.	
- Three pillars should be involved in managing natural/land resources business in an area. They are government, community and investor.	
- Recommendation: In development plan, the company should also take into account GHG emission issue and make effort to allocated HCS areas to avoid large amount of emission.	
- Development should be carried out in areas with low carbon stocks such as shrubs, ex-farmlands and bush.	
- In conservation management plan, we need to take into account not only the environmental aspects (flora and fauna), but also the social aspects (e.g. <i>limbo</i> as an important element to community history and culture).	
- In development and management plan, avoid communication gap between the company and community to prevent against dispute/conflict. Among other things, plasma development plan should also be taken into account and made sure not to get overlooked.	
<b>2. I Putu Hendrawan (Bongan Sub-District Secretary)</b>	
- Bongan Sub-District territory has a high land potential for agriculture and plantation.	
- Currently there are at least 5 stakeholders who manage oil palm plantations operating in Bongan. They are PT JMS, PT PBJ, Lonsum, Farinda, as well as community.	
- There are also other parts of Bongan that are potential for oil palm plantation business, such as locations in	

upstream Bongan area.

- Businesses that use lands, including oil palm plantation, have impacts on the environment. Therefore, it is expected that this Assessment mitigate the impacts and that the company apply the Assessment result and its recommendations.
- This Assessment and the plantation operational activities should remain in compliance with the applicable regulations.

### **3. Abdul Gais (Muara Kedang Village Head)**

- Local name for Müller's gibbon is Kaliawat, and Proboscis monkey is known as Bekantang.
- Proboscis monkey's population and groups can be seen around River Piungan.
- The lake to the north of Muara Kedang Plasma Area is Lake Tanah Liat. It has high fish potential, as well as abundance and biodiversity. People use fish cages on the lake. The village government sees the lake's high potential. The village will apply fish use regulation to the lake. Fishing is allowed only in rain seasons or when the water level is high. It is prohibited during dry seasons or when the water level is low to allow the fish to breed. Currently the lake is mostly covered by water hyacinth and daffodils. If there is opportunity, the village government would like to apply for aid to clean the lake. This is important to maintain the sustainability of the fish and other species potential in the lake area. The village government will propose Lake Tanah Liat and Ulak Medang swamp to become reserves.
- Today Ulak Medang swamp gets polluted by waste from PT PBJ's neighbouring company. The village expects that PT PBJ and the Government could help coordinate with the company to deal with this problem.
- Bades crocodile was once found in River Bongan (in Muara Kedang Village).
- The company should meet its commitment to the environment and community, upholding the agreement with the community.

### **4. H. Herman (Muara Gusik Village Head)**

- Question on the relevancy of the Assessment to social aspects that include agreement with community. PT PBJ and the Assessment team's response: PT PBJ is currently under the KLK Group that is committed to community and environment based on the company policy, as well as commitment to several certification schemes including RSPO. In the context of this Assessment, it is the company obligation to meet FPIC commitment and report this to public. Should the company fail to meet this commitment, it would be subject to RSPO sanction to operation suspension. Community and other stakeholders can file a complaint to RSPO through grievance procedure (described).
- Community has been interacting with several companies in the area and found issues in the process, particularly complaints that are not responded by the companies. However, these companies can operate as usual. The village expect that through this Assessment, RSPO and the government could accommodate community complaints whenever issues are found when interacting with PT PBJ.
- The current management of PT PBJ should help realise the commitment to community, including the responsibilities of the previous and present owner (KLK).

### **5. Andry Salam (Pulau Lanting community leader)**

- Pulau Lanting Village is located near and heavily depends on Lake Jempang as the source of fish.
- Three companies operate around River Bongan and Tongkok emptying to Lake Jempang.
- Therefore, we can say that Pulau Lanting community are affected by the three companies' operations.
- Pulau Lanting community today depends on fish cages in Berawan pool which is part of Lake Jempang.
- Berawan pool now gets cloudy whenever it rains in the upstream part.
- We have not seen the signs of pollution in the upstream area, but expects that this Assessment could participate in preventing pollution that may have impact on Berawan pool.
- Question: How is the village supposed to file complain if we find issues one day? Particularly concerning impacts on community's fish cage activities on Berawan pool.

Assessment team's response: Other than through complaint mechanism to RSPO, environmental pollution issue could be resolved by community and other affected stakeholders by filing complain to the relevant authorities based on Law 32 of 2009 on Environmental Management and Protection. Community can also ask the village government to facilitate when filing the complaint.

Response from the Head of Plantation Department (West Kutai Agriculture Office): We once received a complaint on an issue similar to what you (Pulau Lanting community leader) just mentioned. Other than reporting, you should also be concerned about how to present evidence/finding to substantiate your report. This can be done using laboratory testing etc. as the basis for you to tell which stakeholder should be responsible against whom report will be made. This process can be facilitated by the village government and other organisations including the company. Additionally, report/complaint can also be filed through Environmental Agency (BLH).

After obtaining the review results from the HCVRN, the team again conducted consultations with several parties to obtain additional information. This consultation was carried out through

telephone conversations and direct interviews in Samarinda. The summary of the results of this additional consultation is as follows:

1. The HCV management plan must be practical, collaborative, and prioritize species, particularly proboscis monkeys.
2. The concept of corridor and stepping stone can also be applied and is very good for cultivation areas because the characteristics of gibbons and proboscis monkeys have a wide home range and are adaptive to plantations and settlements. What needs to be considered is the connection with the core habitat. It is suggested that the conservation area which is the main habitat be designed to be compact.
3. There are 3 pillars that must be mutually involved in managing the natural resource / land business in a region, namely the government, the community, and investors.
4. Today most of the Tanah Liat lake area is covered in water hyacinths and daffodils. If there is an opportunity, the village wants to apply for assistance for cleaning the lake. This is to preserve fish and other potential animals in the lake area.
5. The community has experience interacting with several companies in the area and in the process encountered several obstacles, especially complaints that the company did not respond to but the company was able to operate as normal. The village hopes that the RSPO and the government can become a place for the community to complain if problems are found in interacting with PT PBJ.
6. Appeals that the current management of PT PBJ can help realize the commitment to the community, both that was the responsibility of the previous management group and that is the responsibility of KLK as the current management group.
7. The community's hope for PT PBJ is that PT PBJ, which is currently owned by KLK, will immediately fulfill all its promises that have been written in the agreement document.

### 3.3. Soil and Topography Assessment

There are 12 soil types dominated by typic endoaquents (**Figure 25**). Analysis finds no marginal and/or fragile soils, including peat, within the assessment area.

Elevation of the assessment area ranges from around 20 m (60 ft) to over 80 m (240 ft) a.s.l. (**Figure 26**). There is no area with steep slope (> 40%) within PT PBJ MU (**Figure 27**). Slope areas in the assessment area are dominated by flat (0-8%) and undulating (8-15%) slopes.



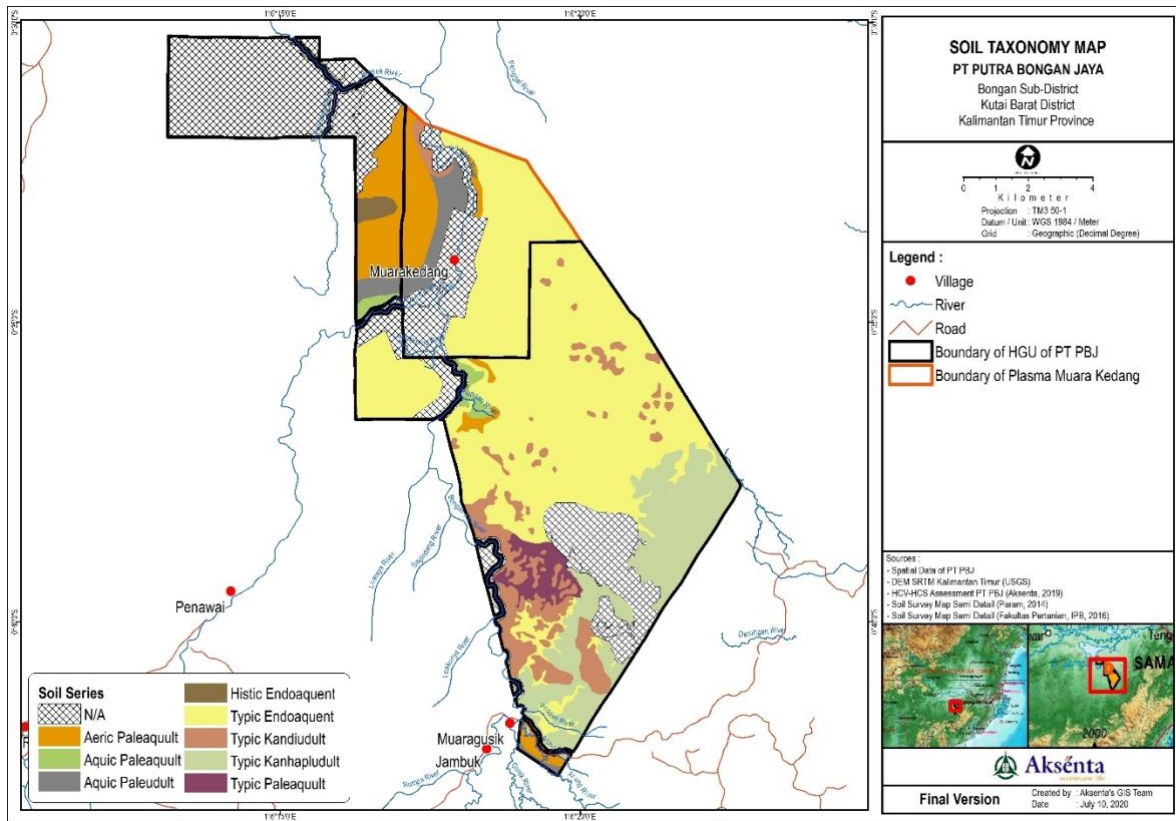


Figure 25. Map of soil types in PT PBJ HGU concession

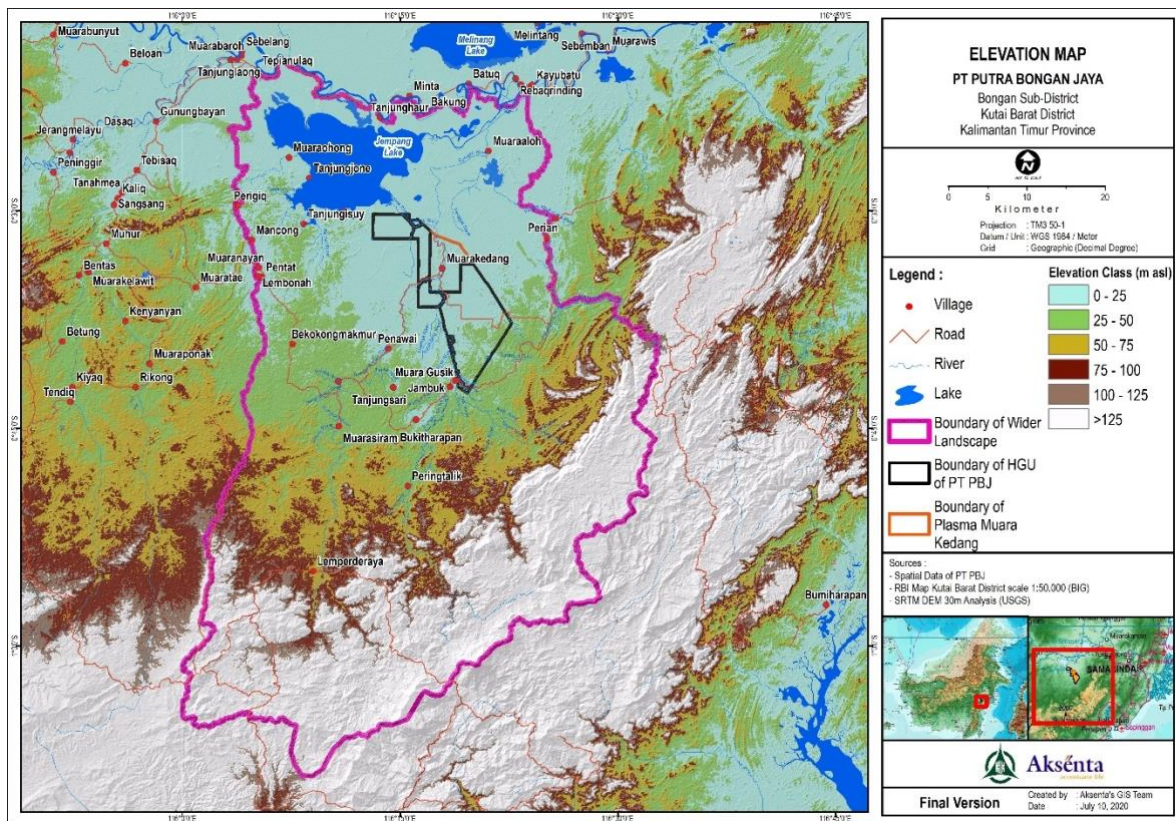


Figure 26. Map of elevations in PT PBJ HGU concession



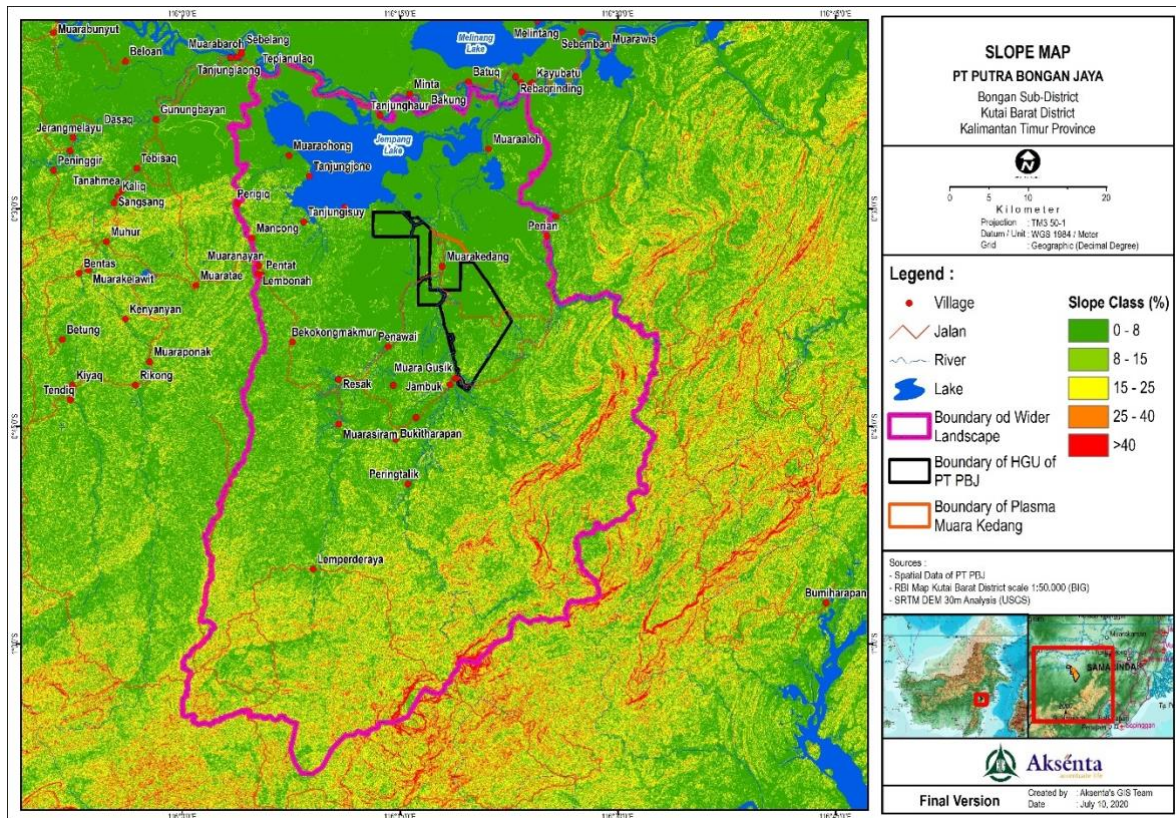


Figure 27. Map of slopes in PT PBJ HGU concession

### 3.4. Carbon Stock and Green House Gas (GHG) Assessments

#### Carbon Stock Assessment

Land cover in PT PBJ MU concession is divided into seven land cover classes, i.e. (i) low-density forest (HKR); (ii) young regeneration forest (HRM); (iii) shrub (BL); (iv) plantation forest (rubber plantation); (v) oil palm plantation (AGRI); (vi) barren soil (bush and inland swamp); and (vii) others (road and settlement and water bodies). See **Table 31** for recapitulation of AGB carbon stock values in the concession. See also **Table 32** for estimate of biomass carbon stock (AGB+BGB) and **Figure 28** for distribution of biomass carbon stock in the concession.

Table 31. Recapitulation of AGB carbon stock in PT PBJ concession

Land cover strata	Area (ha)	Number of plots	Average amount of AGB carbon stock	Standard error of the mean	Confidence limits (90%)		Total amount of AGB carbon tC
					Lower	Upper	
					tC/ha		
Low-Density Forest (HKR)	464.68	37.0	67.2	4.1	60.5	73.9	31,226.50
Young Regeneration Forest (HRM)	639.06	24.0	43.0	1.6	40.3	45.7	27,479.58
Shrub (BL)	320.63	18.0	20.3	1.7	17.5	23.1	6,508.79
Plantation Forest (Rubber Plantation)	169.60	-	38.1*	2.6	11.2	40.7	6,461.76
Oil Palm Plantation (AGRI)	8,762.80	-	59.2**	-	-	-	518,757.76

Land cover strata	Area (ha)	Number of plots	Average amount of AGB carbon stock	Standard error of the mean	Confidence limits (90%)		Total amount of AGB carbon tC
					Lower	Upper	
Barren Soil (Bush and Inland Swamp)	1,153.97	11.0	6.6	0.8	5.3	7.9	7,616.20
Others (Road and Settlement Area, and Water Bodies)	91.61	-	-	-	-	-	-

Note: Integrated HCV-HCSA Assessment Report v.4.0 (Aksenta, 2020)

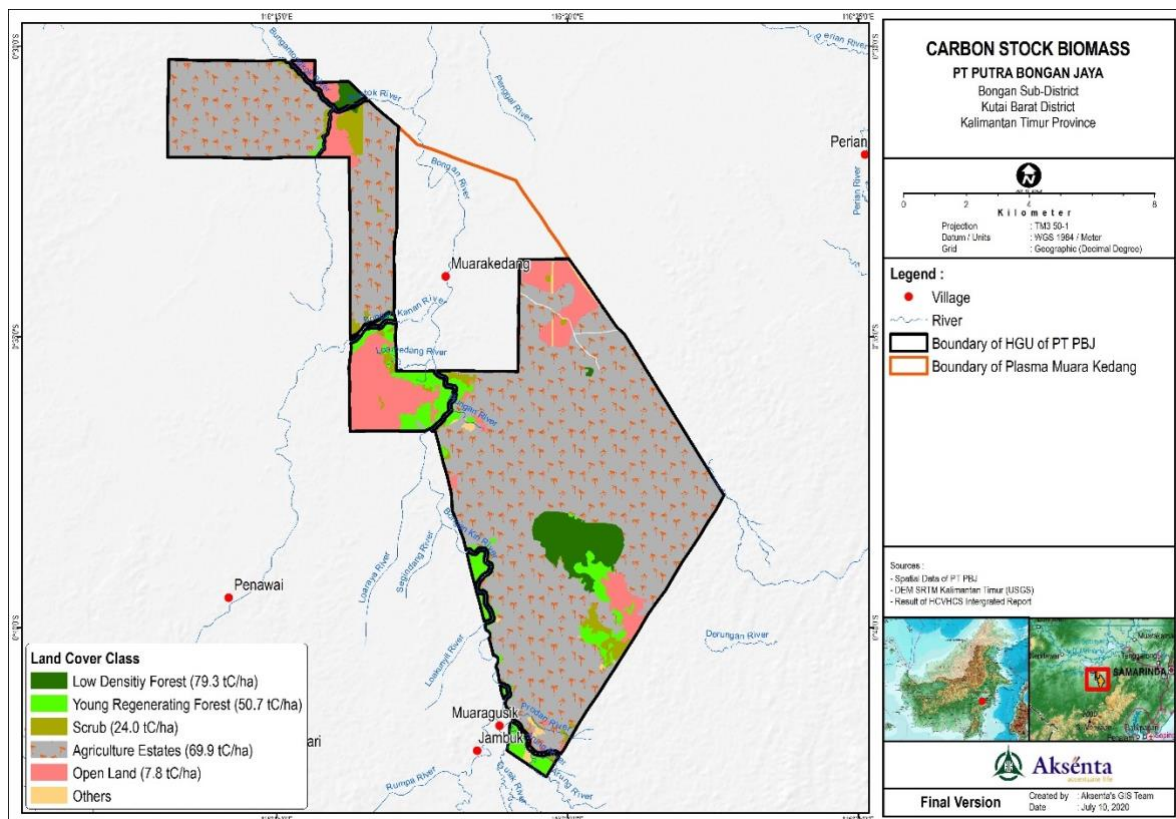
\* PT PBJ Carbon Stock Assessment; \*\*New Development GHG Calculator

**Table 32.** Recapitulation of biomass carbon stock in PT PBJ concession

Land cover stratum	Area	Average biomass carbon stock (AGB+BGB)	Total carbon stock
	(ha)	tC/ha	tC
Low-Density Forest (HKR)	464.68	79.3	36,849.12
Young Regeneration Forest (HRM)	639.06	50.7	32,400.34
Shrub (BL)	320.63	24.0	7,695.12
Plantation Forest (Rubber Plantation)	169.60	45.0	7,632.00
Oil Palm Plantation (AGRI)	8,762.80	69.9	612,519.72
Barren Soil (Bush and Inland Swamp)	1,153.97	7.8	9,000.97
Others (Road and Settlement Area, and Water Bodies)	91.61	-	-

Note: Integrated HCV-HCSA Assessment Report v.4.0 (Aksenta, 2020)

\* Carbon Stock Assessment PT PBJ; \*\*New Development GHG Calculator



**Figure 28.** Map of biomass carbon stock distribution in PT PBJ MU concession

## GHG Assessment

Dynamics of nett GHG emission are divided into two, i.e. GHG emission and fixation respectively sourced from plantation activities and/or mill operations. Sources of emission from new planting include (i) land clearing; (ii) fertiliser production and transportation; (iii) nitrous oxide (N<sub>2</sub>O) emission from fertiliser application; and (iv) use of field fuels in plantations. As for sources of fixation from plantation operations, these include carbon stock and sequestration from crop biomass (crop sequestration). Sources of GHG emission from mill processing include (i) Palm Oil Mill Effluent (POME); (ii) mill fuel; and (iii) purchased electricity for mill operation. In this assessment, there is no GHG fixation sourced from mill processing.

GHG emission projected from new planting management activities are estimated referring to the ongoing management pattern in the company's plantation areas as the empirical data (**Table 33**). The company is yet to have a mill, so that emission from processing is estimated using a simple pattern assumption without further efficiency. See **Table 33** for mill components used in the estimation, along with the sources of reference.

**Table 33.** Components of sources of emission out of plant maintenance and mill operational activities

No	Component	Unit	Amount of Use	Reference
<b>Field Emission</b>				
1	FFB production	tonne/ha/year	28.64	Company document
2	Fuel consumption (diesel)	litre/year	430,652.00	Company document
3	Fertiliser use (urea)	tonne/ha/year	0.13	Company document
		tonne/year	1,010.00	Company document
4	Fertiliser application (MOP)	tonne/ha/year	0.09	Company document
		tonne/year	759.00	Company document
5	Fertiliser application (GRP)	tonne/ha/year	0.18	Company document
		tonne/year	1,429.00	Company document
6	Fertiliser application (dolomite)	tonne/ha/year	0.14	Company document
		tonne/year	1,135.00	Company document
<b>Mill Emission</b>				
7	OER	%	21.7	PPKS Medan (2012) in Fatah (2013)
8	KER	%	5.15	PPKS Medan (2012) in Fatah (2013)
9	Diesel	litre/tonne FFB processed	1.51	Giandadewi <i>et al.</i> (2017)
10	POME Management	%	100.00 Waste collected in anaerobic pool	Conventional management assumption
11	Use of electricity from grid	kWh/year	4,759,446.00	Parinduri (2016)
12	Electricity export	kWh/year	0.00	Conventional management assumption
13	Shell sale	tonne/year	0.00	Conventional management assumption
14	Empty Fruit Bunch (EFB) management	%	100 Piled up in open space	Conventional management assumption

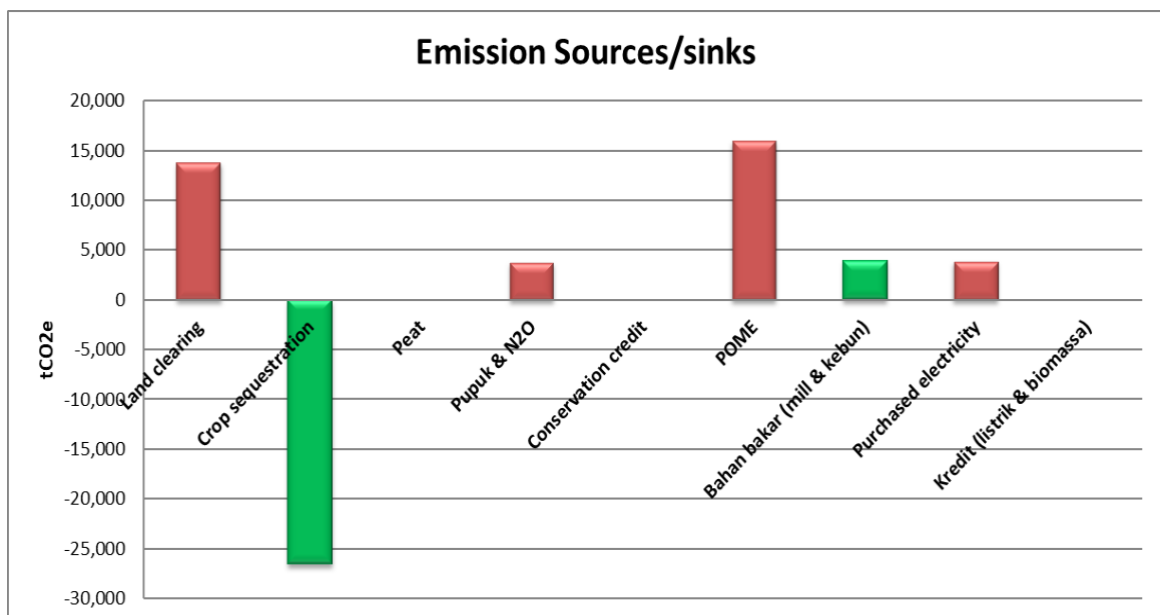
Analysis using RSPO New Development Greenhouse Gas Calculator indicates that new oil palm plantations in PT PBJ MU concession will produce GHG fixation of 5.3 kilotonne CO<sub>2</sub>e (**Table 34**). Total emission from four new plant maintenance components that become sources of GHG emission is smaller than the fixation sourced from biomass growth. Nett amount of GHG emission from mill processing based on estimation is 20.2 kilotonne CO<sub>2</sub>e.

Nett emission is estimated by summing up nett emission from plantation and mill processing. In general, mill waste is identified as the largest source of GHG emission, while sequestration of carbon from new plants is the only source of GHG fixation (**Figure 29**). This summing up of nett GHG emission from plantations and mill indicate that new plantings and their management will produce a nett GHG emission of 14.8 kilotonne CO<sub>2</sub>e, which is equal to 0.68 tonne CO<sub>2</sub>e/tonne CPO and 0.57 tonne CO<sub>2</sub>e/tonne palm kernel (PK).

**Table 34.** Projected nett GHG emission

Sources	Total Emissions (t CO <sub>2</sub> e)	Emission/Area (t CO <sub>2</sub> e/ha)	Emission/Produced FFB (t CO <sub>2</sub> e/t FFB)
<b>Field Emission</b>			
Land clearing	13,829.51	4.87	0.17
Crop sequestration	-26,578.19	-9.36	-0.33
Fertilisers*	1,002.44	0.35	0.01
N <sub>2</sub> O	2,839.55	1.00	0.03
Field fuel*	3,577.96	1.26	0.04
<b>Total Field Emission</b>	<b>-5,328.73</b>	<b>-1.88</b>	<b>-0.07</b>
<b>Mill Emission</b>			
POME	15,941.02	5.61	0.20
Mill fuel	383.14	0.13	0.00
Purchased electricity	3,851.30	1.36	0.05
Credit (excess electricity exported)	0.00	0.00	0.00
Credit (sale of biomass for power)	0.00	0.00	0.00
<b>Total Mill Emission</b>	<b>20,175.45</b>	<b>7.11</b>	<b>0.25</b>
<b>Net Emission from Field and Mill (tonneCO<sub>2</sub>e)</b>		<b>14,842</b>	
<b>Net Emission/Production (tonneCO<sub>2</sub>e/tonneCPO)</b>		<b>0.68</b>	
<b>Net Emission/Production (tonneCO<sub>2</sub>e/tonnePK)</b>		<b>0.68</b>	

Note: Negative (-) value refers to carbon fixation



Source: Analysis using RSPO New Development Green House Gas Calculator

**Figure 29.** Chart of the overall nett GHG emission projected (estimated)



There are two new planting plan scenarios as a component of measured GHG mitigation effort (**Table 35**). The first scenario is the baseline indicating GHG emission development and projection plans without mitigation effort, while the second indicates an alternative development plan for reducing GHG emission amount. The alternative plan for reducing GHG emission involves landuse management that divides some parts of potential lands for new planting and make them conservation areas instead. While the alternative reduces the effective area for new planting and potential FFB production from new plantings. However, the scenario has added-value from environmental conservation value and carbon preservation sides.

Each scenario implementation will produce different GHG emission. Estimation indicates that scenario 2 implementation may significantly reduce nett GHG emission. This will produce negative nett GHG emission or, in other words, this will lead to GHG fixation of 388 tonne CO<sub>2</sub>e (**Table 36** and **Figure 30**). Gap between emission values produced from the scenario 2 implementation will be 15.2 kilotonne CO<sub>2</sub>e.

**Table 35.** Scenario for new planting development

Scenario		Description	
S1		Planned of development in all potential new planting areas	
S2		Exclusion of HCV areas, HCS areas and community lands. Planned development outside conservation areas <sup>20</sup> .	
Treatment		Scenario 1	Scenario 2
		Area (ha)	
Development plan	Low-Density Forest (HKR)	464.68	0.0
	Young Regeneration Forest (HRM)	639.06	0.0
	Shrub (BL)	320.63	199.46
	Plantation Forest (Rubber Plantation)	169.60	66.99
	Oil Palm Plantation (AGRI)	8,762.80	0.0
	Barren Soil (Bush and Inland Swamp)	1,153.97	451.68
	Others (Roads and Settlement Areas, and Water Bodies)	91.61	63.90
Total Conservation Area		0.0	2,076.61

**Table 36.** Comparison of the projected nett GHG emission from each development scenario

Source	Emission	
	S1	S2
<b>Field emissions and credit (tonneCO<sub>2</sub>e)</b>		
Land clearing	13,829.51	1,734.06
Crop sequestration	-26,578.19	-7,321.16
Fertilisers	1,002.44	276.08
N <sub>2</sub> O	2,839.55	782.03
Field fuel	3,577.96	985.39
Peat	0.00	0.00
Conservation credit	0.00	-5,191.53
<b>Nett Field Emission</b>	<b>-5,328.73</b>	<b>-8,735.12</b>

<sup>20</sup> Map of Conservation Landuse in the Company Operational Area can be seen in Integrated HCV-HCSA Assessment Report v.4.0 (Aksenta, 2020).

Emission		
Source	S1	S2
<b>Mill emissions and credit (tonneCO<sub>2</sub>e)</b>		
POME	15,941.02	4,390.26
Mill fuel	383.14	105.52
Purchased electricity	3,851.30	3,851.30
Credit (excess electricity exported)	0.00	0.00
Credit (sale of PKS for power)	0.00	0.00
<b>Nett Mill Emission</b>	<b>20,175.45</b>	<b>8,347.07</b>
<b>Nett Emission from Field and Mill (tonneCO<sub>2</sub>e)</b>	<b>14,842</b>	<b>-388</b>
<b>Nett Emission/Production (tonneCO<sub>2</sub>e/tonneCPO)</b>	<b>0.68</b>	<b>-0.06</b>
<b>Net Emission/Production (tonneCO<sub>2</sub>e/tonnePK)</b>	<b>0.68</b>	<b>-0.06</b>

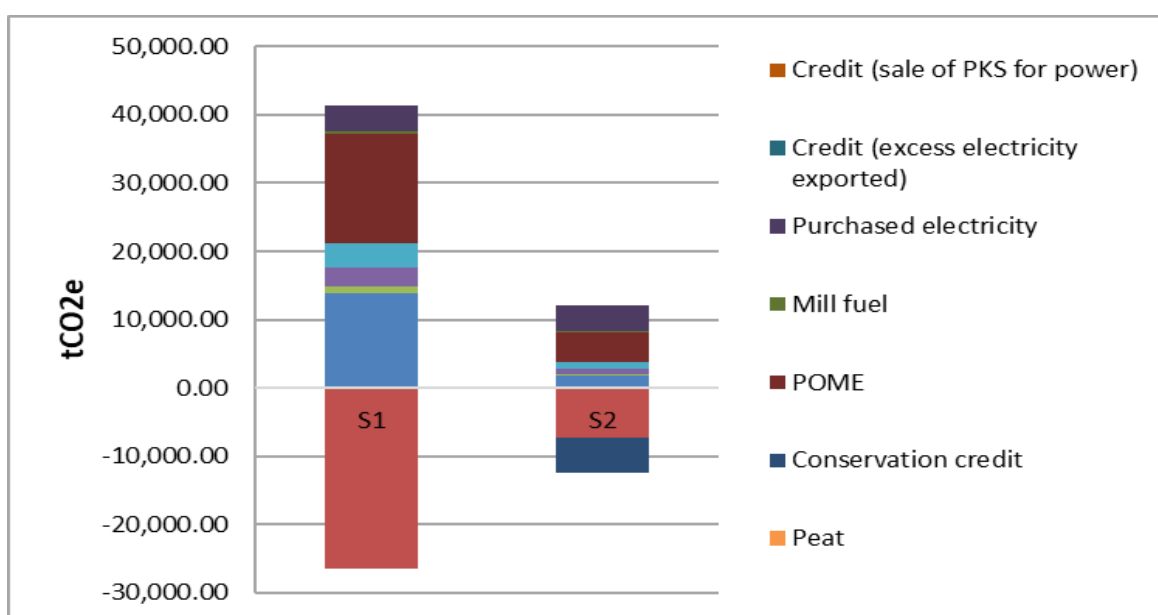


Figure 30. Comparison of GHG emission projection from each development scenario

### 3.5. LUCA

#### LUCA

Primary forests in PT PBJ MU concession and its surrounding has been removed since the logging operation by companies holding Forestry Business Permit (HPH) concessions<sup>21</sup> starting in 1973. Fires have been recorded in this area, i.e. in 1982, 1987, 1997 and 2002. One of the large-scaled forest and land fires has been verified through analysis of satellite image dated 25 May 1998. Forest fire broke out almost in the entire concession of PT PBJ MU and left parts that currently become HCV areas. Land cover type in PT PBJ MU concession that has been subject to dominant changes is bushland whose area has seen an increase from November 2005 to April 2009 (Table 37).

Liability calculation based on land cover change that has taken place since 2005 up to the HCV assessment (April 2009) indicates that the company has no compensation liability and no area is

<sup>21</sup> PT BFI (1973-1992) whose operational area included the southern part of the assessment area and PT ITCI (1983-1990) whose operational area was along the present day's Tenggara-Melak road.

subject to environmental remediation. Land clearing within PT PBJ MU concession was carried out after the HCV assessment was conducted in April 2009 (**Figure 31** and **Figure 32**). Matrix of land cover change in the period of 2005-2007 and 2007-2009 show on **Table 38** and **Table 39** respectively.

**Table 37.** Land cover change in PT PBJ HGU concession for compensation liability

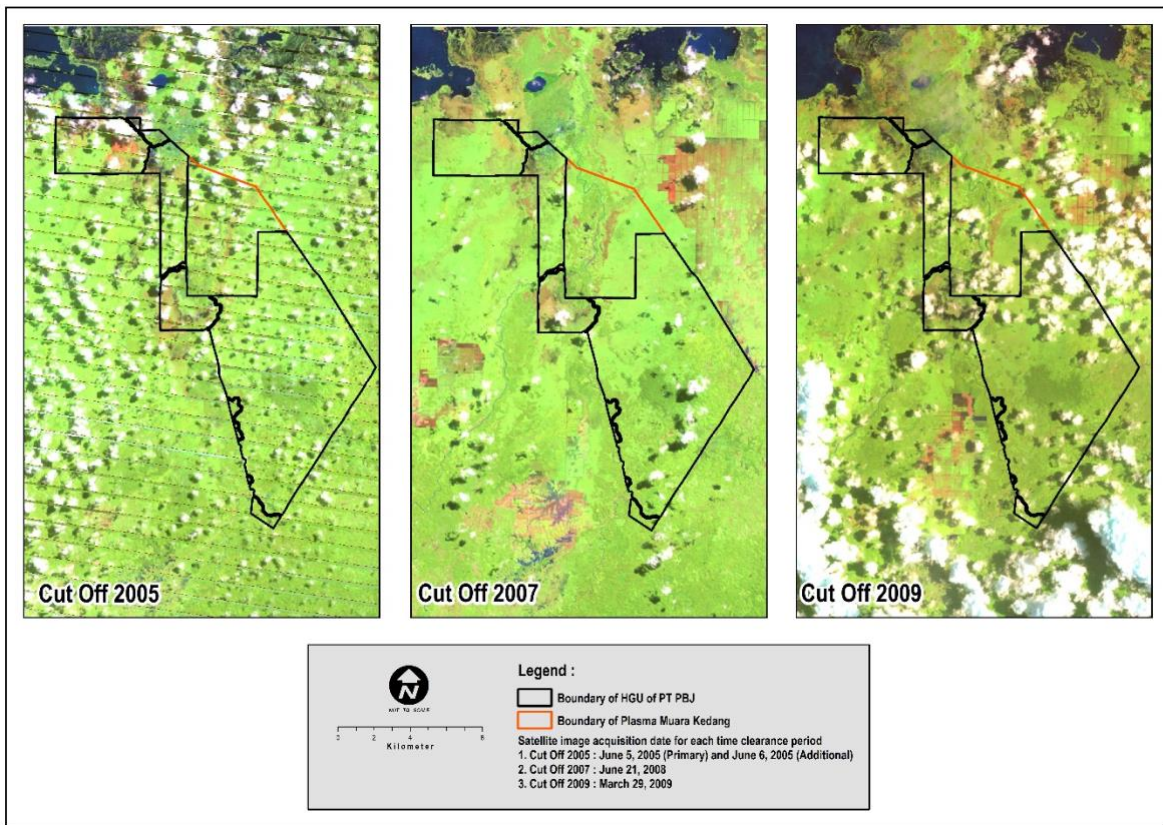
Land cover	November 1, 2005	December 1, 2007	April 31, 2009 (HCV Assessment)
Secondary forest	866.83	866.83	871.84
Old shrub	1,040.33	1,060.11	1,049.87
Young shrub	6,730.27	6,849.95	5,685.68
Rubber	116.96	116.96	116.96
Bush	2,009.03	1,824.39	3,753.45
Bare land	736.77	869.76	110.20
Water body	102.16	14.35	14.35
<b>Total</b>	<b>11,602.34</b>	<b>11,602.34</b>	<b>11,602.34</b>

**Table 38.** Matrix of land cover change in the period of 2005-2007

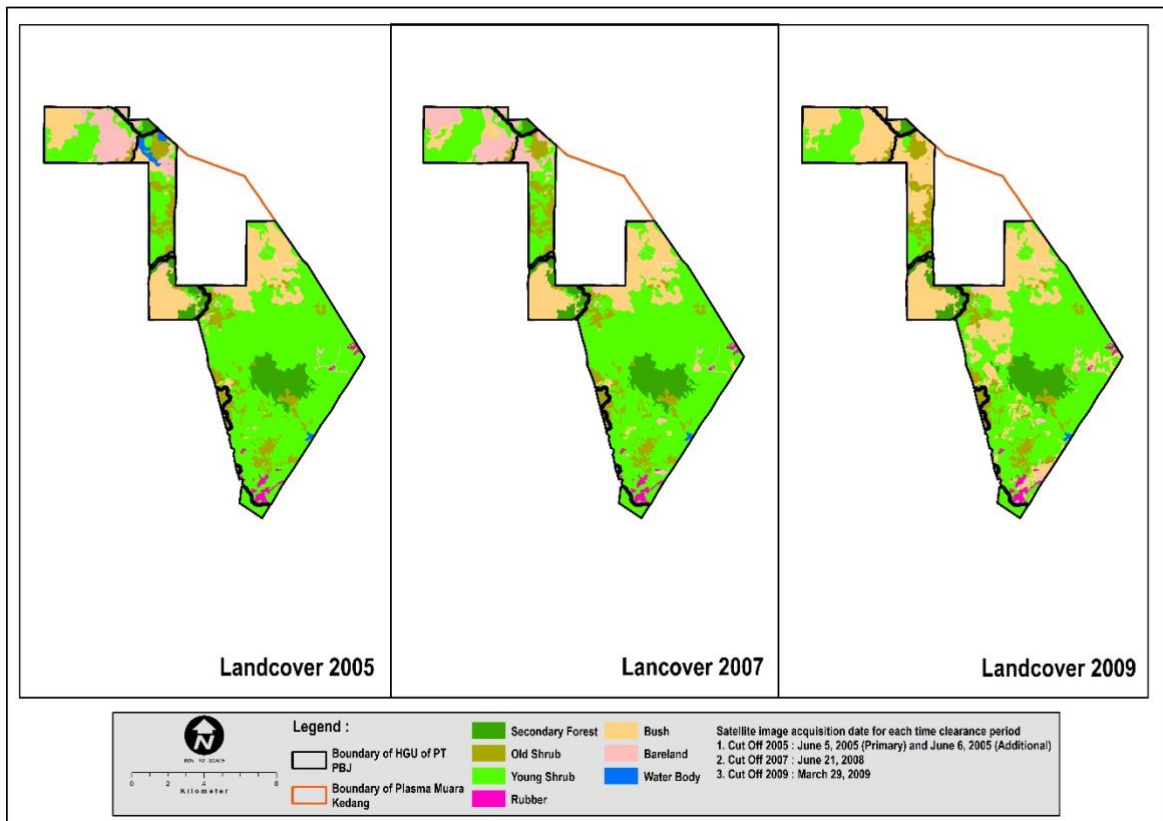
Land Cover 2005	Land Cover 2007							Total 2005
	Secondary forest	Old shrub	Young shrub	Rubber	Bush	Bare land	Water body	
Secondary forest	866.8	-	-	-	-	-	-	866.8
Old shrub	-	1,024.3	13.7	-	-	2.4	-	1,040.3
Young shrub	-	35.8	6,603.8	-	45.4	45.3	-	6,730.3
Rubber	-	-	-	117.0	-	-	-	117.0
Bush	-	-	36.7	-	1,678.3	294.0	-	2,009.0
Bare land	-	-	195.8	-	100.7	440.3	-	736.8
Water body	-	-	-	-	-	87.8	14.3	102.2
<b>Total 2007</b>	<b>866.8</b>	<b>1,060.1</b>	<b>6,850.0</b>	<b>117.0</b>	<b>1,824.4</b>	<b>869.8</b>	<b>14.3</b>	<b>11,602.3</b>

**Table 39.** Matrix of land cover change in the period of 2007-2009

Land Cover 2007	Land Cover 2009							Total 2007
	Secondary forest	Old shrub	Young shrub	Rubber	Bush	Bare land	Water body	
Secondary forest	861.5	0.6	2.7	0.0	2.1	-	-	866.8
Old shrub	10.4	1,015.8	-	-	34.0	-	-	1,060.1
Young shrub	-	33.5	5,637.1	-	1,141.2	38.1	-	6,850.0
Rubber	-	-	-	117.0	-	-	-	117.0
Bush	-	-	41.1	-	1,783.3	-	-	1,824.4
Bare land	-	-	4.8	-	792.8	72.1	-	869.8
Water body	-	-	-	-	-	-	14.3	14.3
<b>Total 2009</b>	<b>871.8</b>	<b>1,049.9</b>	<b>5,685.7</b>	<b>117.0</b>	<b>3,753.5</b>	<b>110.2</b>	<b>14.3</b>	<b>11,602.3</b>



**Figure 31.** 2005, 2007 and 2009 satellite images showing PT PBJ HGU concession



**Figure 32.** 2005-2009 changes of land cover in PT PBJ HGU concession

In the context of NPP, cut-off used for the analysis of land cover changes is from 1 January 2010 to 22 October 2020. The results of the analysis show that PT PBJ oil palm areas cleared from 1 January 2010 to 22 October 2020 is 8,833.10 ha (**Table 40**, **Figure 33** and **Figure 34**). Matrix of land cover change in the period of 2010-2019 and 2019-2020 show on **Table 41** and **Table 42** respectively.

**Table 40.** Land cover change on the PT PBJ HGU concession for NPP

Land cover	January 1, 2010 (NPP)	8 February, 2019 (HCV-HCSA Assessment)	October 22, 2020 (Additional cut-off for NPP)
Secondary forest	857.96	476.27	476.27
Old shrub	1,069.46	515.73	515.73
Young shrub	5,486.11	325.99	324.88
Rubber	127.02	156.94	156.94
Bush	3,681.51	1,191.24	1,180.32
Bare land	102.28	89.67	101.70
Oil palm of PT PBJ	277.86	8,833.10	8,833.10
Oil palm of PT JMS	-	11.18	11.18
Oil palm of Community	-	1.02	1.02
Water body	0.14	1.21	1.21
<b>Total</b>	<b>11,602.34</b>	<b>11,602.34</b>	<b>11,602.34</b>

**Table 41.** Matrix of land cover change in the period of 2010-2019

Land Cover 2010	Land Cover 2019										Total 2010
	A	B	C	D	E	F	G	H	I	J	
Secondary forest	476.3	177.5	16.9	-	1.6	-	185.5	-	0.3	-	858.0
Old shrub	-	338.2	-	77.0	9.5	12.3	631.9	-	-	0.5	1,069.5
Young shrub	-	-	249.6	31.4	245.4	56.5	4,891.3	11.2	0.8	-	5,486.1
Rubber	-	-	-	42.6	2.2	0.7	81.5	-	-	-	127.0
Bush	-	-	55.7	5.9	917.5	19.2	2,682.7	0.0	-	0.5	3,681.5
Bare land	-	-	3.9	-	15.2	1.0	82.2	-	-	-	102.3
Oil palm of PT PBJ	-	-	-	-	-	-	277.9	-	-	-	277.9
Water body	-	-	-	-	-	-	-	-	-	0.1	0.1
<b>Total 2019</b>	<b>476.3</b>	<b>515.7</b>	<b>326.0</b>	<b>156.9</b>	<b>1,191.2</b>	<b>89.7</b>	<b>8,833.1</b>	<b>11.2</b>	<b>1.0</b>	<b>1.2</b>	<b>11,602.3</b>

Note:

A = Secondary forest      C = Young shrub      E = Bush      G = Oil palm of PT PBJ      I = Oil palm of Community  
 B = Old shrub      D = Rubber      F = Bare land      H = Oil palm of PT JMS      J = Water body

**Table 42.** Matrix of land cover change in the period of 2019-2020

Land Cover 2019	Land Cover 2020										Total 2019
	A	B	C	D	E	F	G	H	I	J	
Secondary forest	476.3	-	-	-	-	-	-	-	-	-	476.3
Old shrub	-	515.7	-	-	-	-	-	-	-	-	515.7
Young shrub	-	-	324.9	-	-	1.1	-	-	-	-	326.0



Land Cover 2019	Land Cover 2020										Total 2019	
	A	B	C	D	E	F	G	H	I	J		
Rubber	-	-	-	156.9	-	-	-	-	-	-	-	156.9
Bush	-	-	-	-	1,180.3	10.9	-	-	-	-	-	1,191.2
Bare land	-	-	-	-	-	89.7	-	-	-	-	-	89.7
Oil palm of PT PBJ	-	-	-	-	-	-	8,833.1	-	-	-	-	8,833.1
Oil palm of PT JMS	-	-	-	-	-	-	-	11.2	-	-	-	11.2
Oil palm of Community	-	-	-	-	-	-	-	-	1.0	-	-	1.0
Water body	-	-	-	-	-	-	-	-	-	1.2	-	1.2
<b>Total 2020</b>	<b>476.3</b>	<b>515.7</b>	<b>324.9</b>	<b>156.9</b>	<b>1,180.3</b>	<b>101.7</b>	<b>8,833.1</b>	<b>11.2</b>	<b>1.0</b>	<b>1.2</b>	<b>11,602.3</b>	

Note:

A = Secondary forest    C = Young shrub    E = Bush    G = Oil palm of PT PBJ    I = Oil palm of Community  
 B = Old shrub    D = Rubber    F = Bare land    H = Oil palm of PT JMS    J = Water body

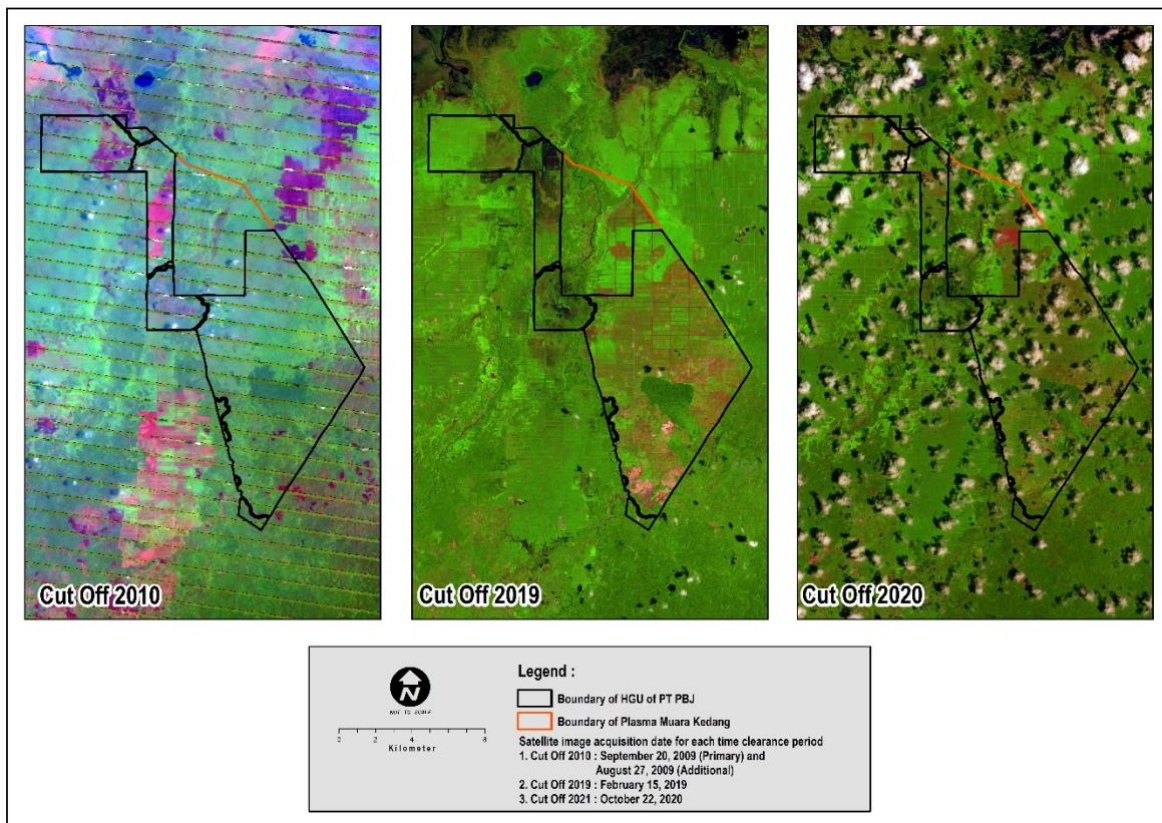
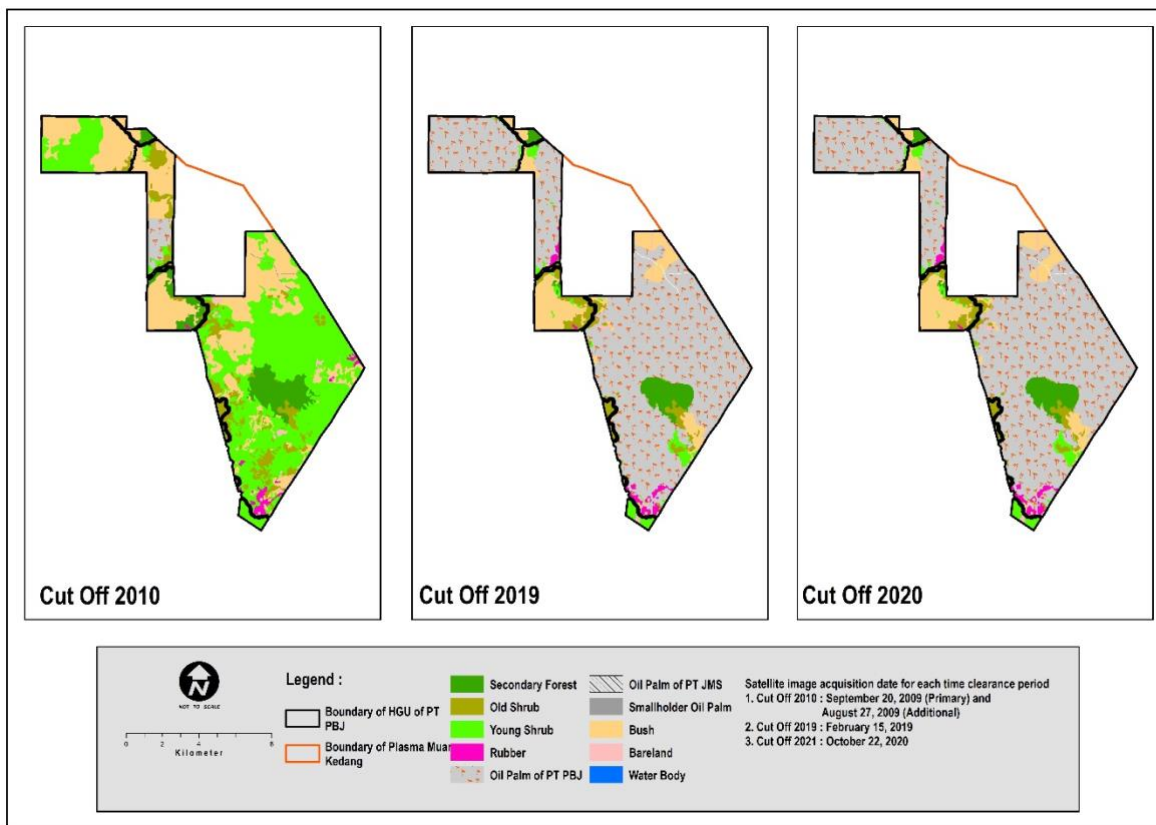


Figure 33. 2010 and 2019 satellite images showing PT PBJ HGU concession



**Figure 34.** 2010-2019 change of land cover in PT PBJ HGU concession

### Social Liability Assessment

The assessment indicates that PT PBJ has no social liability. Land clearing and oil palm plantation development process in PT PBJ MU have not removed HCV 4, 5 and 6 areas.

### 3.6. FPIC Process

FPIC process initiation through meetings with community and through land-related technical study involving community and stakeholders in Committee-B and Team 11 was then followed up with cooperation agreement. Agreement between PT PBJ and community particularly relates to land compensation, plantation development plan and plasma plantation development plan. In addition, cooperation also includes public facility and village infrastructure construction as well as creating job opportunities. These documents record the meetings concerning development of plasma plantation in Muara Gusik Village (dated 7 February 2013, 2 September 2013, 9 December 2013, 11 March 2014, 14 September 2016 and 23 January 2018), Pulau Lanting Village (4 June 2016), and Muara Kedang Village (22 November 2017). As for Jambuk community, agreement is still being prepared and the lands for plasma plantation are still being identified in areas that currently are still covered by location permit.

The company has forged a cooperation agreement with Sawit Jaya Cooperative (1<sup>st</sup> Revision No. 013/SPK/PBJ-JKT/IX/2013 dated 7 June 2017) on Plasma Plantation Muara Kedang Village, and another with Sawit Gusik Mandiri Sejahtera Cooperative (Agreement No. 008/SPK/PBJ-BPN/VIII/2018 dated 9 August 2018) on Plasma Plantation in Muara Gusik Village. To the date of groundtruthing, they were still searching for locations for plasma plantation in Pulau Lanting Village, based on §3.2 of the cooperation agreement (dated 23 May 2016). Regarding FPIC process progress in Jambuk Village, they were still identifying land ownership together with community.

Under the management of KLK Group, PT PBJ has a Standard Operating Procedure (SOP) with regard to the FPIC process, namely the SOP for Free, Prior and Informed Consent (FPIC) and the SOP for Opening New Lands. In this SOP, the community was actively involved from the start, including the formation of a Community Involvement Team (TKM) and Community Representative Committee (KPM), identification of land ownership, participatory mapping, compensation agreements, negotiations, determination of plasma plantation locations, and social agreements / agreements. Based on the cooperation agreement document (under the old management), the mechanism for further interaction between the Company and the community related to the development of plasma plantations will be agreed upon by the Company and the cooperative whose representatives or management will be formed and agreed upon by the cooperative members themselves. Companies under the new management will continue the ongoing process of negotiation and cooperation, in accordance with the applicable SOPs and by applying the principles of FPIC.

For the implementation of this Integrated HCV-HCSA Assessment, PT PBJ has requested for approval from Muara Gusik, Muara Kedang, Jambuk and Pulau Lanting Village Governments on 10 December 2018. Represented by the village governments in question, the communities have approved in writing, which can be used by the company as the basis to carry out the assessment. During the assessment process, the assessment team gives all assessment-related information to local community, in which they are actively engaged in the assessment process including participatory mapping and field observation. The output is then consulted back to community representatives through a final consultation forum.

The Integrated HCV-HCSA Assessment finds the presence of spare lands owned by Muara Kedang and Muara Gusik communities, which are located within PT PBJ MU concession (see **Figure 23** and **Figure 24**). The company respects the spare lands. Definitive boundaries of the spare lands will be set on a participatory basis during ICLUP finalisation. In fact, even though HCV5 had been determined together with the community at the time of the study, considering that some of these areas belonged to the community, but over time the community changed their position. In the process of drafting an ICLUP that was carried out collaboratively with the community, the community proposed that part of the HCV5 area be developed for oil palm. Therefore, the ICLUP recommendation map from the HCV assessment was revised for the HCV5 section. Meanwhile, other HCVs remain unchanged. This has been agreed upon by the community.

## 4. Summary of Management Plan

### 4.1. Team Responsible for Developing Management Plans

The following are the personnel who are responsible for developing management plan for PT PBJ.

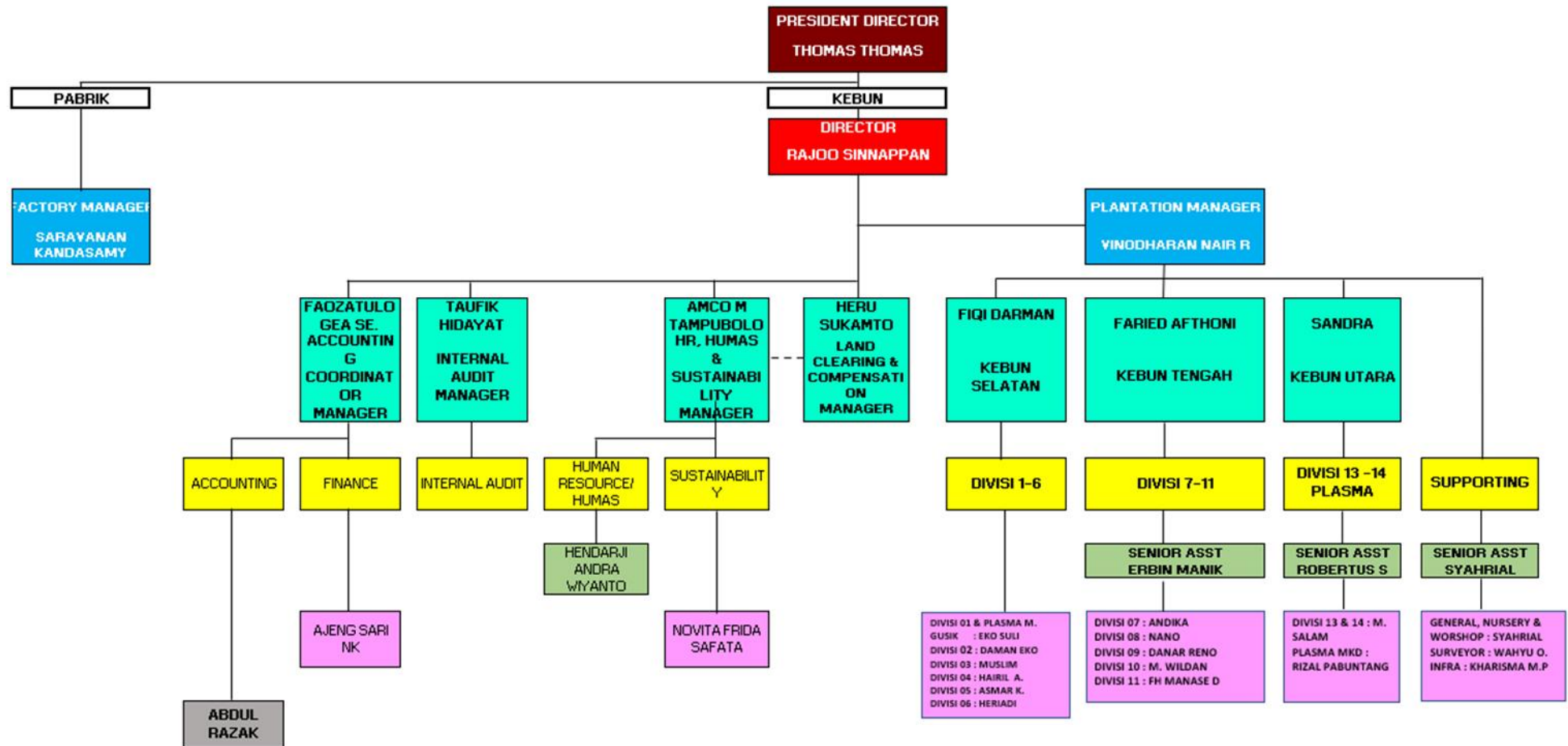


Figure 35. Chart of PT PBJ's organisational structure

## 4.2. Management Plan to Mitigate Impacts to the Social and Environment

### Elements to be included for SEIA

Social management and monitoring plan aims to reduce and/or eliminate and mitigate negative impacts, social risk, and social issues related to the new development and management activities. In addition, it is also designed to improve the positive impact and benefits to the social. The management plan recommended based on the SIA refers to KLK Sustainability Policy and Sustainability Mission.

The KLK Sustainability Policy states that KLK is committed to ensure that its products are produced in a sustainable manner. This is realised through continuous balanced assessment and development of its operations while simultaneously conserving and improving the natural environment, protecting high carbon stock forests, High Conservation Value Areas, and peatlands, uplifting the socio-economic conditions and respecting the human rights of its employees and local communities.

The KLK Sustainability Mission states that KLK is committed to create sustainable stakeholder values by integrating environmental and societal concerns into its business strategies and performance. The management of sustainable business and corporate responsibility activities are focused on four core areas, namely: *Marketplace, Environment, Community, and Workplace*.

**Table 43.** Social management plans

Topic (areas)	Management	Period	Person in charge
Social management priority for the company productivity ( <i>Community and Workplace</i> )	Arrange social management priority and handle it base on its influence company operation. Especially regarding the promises of old management that has been given to the key stakeholders from Kampung Muara Gusik, Muara Kedang, Jambuk and Pulau Lanting.	Annually	Director/General Manager, Sustainability Manager, and plantation management unit
Role of the company in social development (training, scholarship) and local development are not integrated and are not well communicated to the company stakeholders ( <i>Community and Workplace</i> )	Integrate all activities related in social management and development (internal and external), including CSR activities, into Company Social Management Master Plan. Include in this integration is management of suppliers and contractors as an integrated part of social development	Annually	Director/General Manager, Sustainability Manager, and plantation management unit
	Coordinate Social Management Priority Plan accordingly to the Company Social Mission.	Annually	Director/General Manager, Sustainability Manager, and plantation management unit
	To communicate company and its smallholder partners contribution in local development to company stakeholders. Especially to villages community, villages, district, and Regency officials.	Annually	Plantation management unit
	To participate in Musrenbang (local development plan forum) in order to be effectively participate in local development	Annually	Plantation management unit
	To mitigate negative social impact and social risks as well as enhancing positive social impact of the company.	Annually	Plantation management unit
Impacts on employment, employment opportunities or from changes of employment terms ( <i>Community and Workplace</i> )	Increasing the number of workers, especially workers from villages related to the company permit location according to SOP of workers recruitment .	Annually	Plantation management unit



Topic (areas)	Management	Period	Person in charge
Social impact potential to the surrounding communities, including salient risk of human rights violations (Community and Workplace)	Applying SOP of Conflict Resolution (Management) and Land Acquisition according standard of the new Management.	Annually	Director/General Manager, Sustainability Manager, Land Clearing & Compensation Manager and plantation management unit
Insufficient SOPs (Workplace)	Preparing, completing, authorizing, and implementing of the SOPs in the workplace.	Annually	Director/General Manager, Sustainability Manager, and plantation management unit
SOPs and documentations are not yet well organized, causing obstacles in certification process (Workplace)	Endorsement the SOPs and improvement of the documentation system which referring to the main company's standard and RSPO standard. Gap assessment on company's situation to the RSPO standard.	Annually	Director/General Manager, Sustainability Manager, and plantation management unit
	Integration of all documents related with RSPO standard in the estate level to the top management level.		
	Complete the list of stakeholders in the oil palm industry.		
	Complete the list of work contracts and MoUs with the contractor, partnership plantation, and workers according to the RSPO standard.		
Impacts on all dimension of food and water security including the right to adequate food, and monitoring food and water security for affected communities (Community and Workplace)	Participate in food security activities program developed by local government	Annually	Director/General Manager, Sustainability Manager, and plantation management unit
	Participate in developing food crop agriculture and land management without burning		
Housings and supporting facilities which has not meet the sanitation standard, water supplies standard, and waste management standard; which are effect on the workers productivity. (Workplace)	Establish and implement sanitation and waste management standards.	Annually	Director/General Manager, Sustainability Manager, and plantation management unit
	Improve the sanitation system in housing and workplace, especially the sewerage system		
	Regular control and manage the quality of the workers housings.		
	Continue the workers housing development accordingly with the standards, equipped with water supplies and electricity, especially for the contract workers		
Workers which are not yet equipped with personal protective equipment, causing risk of accidents and problems in production activity. (Workplace)	Provide personal protective equipment with sufficient quantities and qualities.	Annually	Director/General Manager, Sustainability Manager, and plantation management unit
	Encourage the importance of personal protection equipment and occupational health and safety and conducting its training		
Increase labor recruitment from the local communities (Community and Workplace)	Continuing the new development plan (plantation expansion) in the operational area	Annually	Director/General Manager, Sustainability Manager, and plantation management unit
Adapting RSPO P&C 2018 (Marketplace, Community and Workplace)	Evaluating, documenting and implementing all social management activities in line with PT Putra Bongan Jaya (KLK Group) standard and corresponding to RSPO P&C 2018		

Along with the implementation of the management plan, PT PBJ is recommended to group the components of the management plan into three programs. The programs are planned to be implemented in time period between 2020 and 2023. The three programs are as follows:

1. Preparation of general plan of social management in PT PBJ
  - Preparation of the general social management of PT PBJ in accordance with the standard social management of the KLK Group. It includes CSR and partnership programs, labour management and its social environment. The plan is referring to KLK Group Sustainability Policy and Mission corresponding to the RSPO P&C 2018.
  - Programs of consolidation of the licensed area and operations of PT PBJ.
2. Preparation of social management in the surroundings area of PT PBJ. The main strategy of this program is to strengthen the relationship (partnership) with the communities as part of the CSR.
  - Establishment of positive relation with stakeholders
  - Participation of the PT PBJ to social development
  - Partnership program and facilitation of the development of community's food security area through a crop business management unit.
3. Preparation of social management plan in labour of PT PBJ and residents in housings in PT PBJ operational area. The strategy of this program is to improve the professionalism and welfare of the labour and management.
  - Coaching of communication and social relation involving all of the labour and housings residents
  - Improvement of the labour's and management's welfares
  - Improvement of the labour's and management's professionalism

Monitoring activity plans are designed as evaluations on implementation of the management activity, thus the monitoring implementation is program-based evaluation. The monitoring plan aims to evaluate the implementation of the management plan, achievement of the targets, and effectivity of the implementations regarding with the available resources.

Outputs of the monitoring would be used to adjust the management plan for the next implementations. Monitoring will be conducted in participatory involving beneficiaries of the programs, which is the communities. Monitoring would be conducted periodically along the implementation of the management plan as part of it.

## Elements to be included for environmental impact assessment

**Table 44.** Summary of Environmental impact and Management Plan

No	Significant Environmental Aspect		Benchmark	Management Objective	Environmental Management Plan	Location	Period	Person in Charge
	Environmental Component/ Parameter	Aspect (Source)						
<b>Development Phase</b>								
a	Weather (micro)	Land opening and clearing activities	Minimum fluctuation of air temperature after land opening and clearing activities	Air temperature and humidity at plantation area will return to its original condition	Conduct land opening and clearing in stages and to conserve important areas like river riparian, to ensure natural vegetation is managed properly	Related Villages, Bongan District, Kutai Barat Regency	Throughout land opening and clearing period	Plantation manager and Sustainability Manager
b	Gas emission and Dust	Land opening and clearing activities, mobilization of equipment and material, development of plantation facilities	Ambient air quality is maintained according to PP no. 41 tahun 1999 regulation	Minimize the dust concentration (PM 10) and gas emission (SO <sub>2</sub> , CO, O <sub>3</sub> dan NO <sub>2</sub> ) according to PP no. 41 tahun 1999 regulation	<ol style="list-style-type: none"> <li>1. Prevent felling of trees along the river riparian and conservation area</li> <li>2. Use good condition equipment</li> <li>3. Ensure periodic maintenance is carried out on all equipment, especially those which emits gas and dust during operation</li> <li>4. Reduce the speed of vehicles transporting equipment and material, especially on dusty and non-asphalt roads</li> <li>5. Conduct water spraying in dusty areas</li> </ol>	Plantation areas and damaged, dusty and non-asphalt roads used by heavy machineries and transportation of material, facility development location	Throughout land opening and clearing period, mobilization of equipment and material, development of plantation facilities	Plantation manager and Sustainability Manager
c	Noise	Land opening and clearing activities, mobilization of equipment and material, development of plantation facilities	Noise level is according to Keputusan Menteri Negara Lingkungan hidup No. 48/MENLH/11/1996	Minimize the noise level according to Keputusan Menteri Negara Lingkungan hidup No. 48/MENLH/11/1996 regulation	<ol style="list-style-type: none"> <li>1. To implement the use of ear plugs for respective workers</li> <li>2. Prevent felling of trees along the river riparian and conservation area</li> <li>3. Ensure periodic maintenance is carried out on all equipment, in particular those which generate significant amount of noise during operation</li> <li>4. Reduce the speed of vehicles transporting equipment and material.</li> <li>5. Install silencer on heavy machineries exhaust to reduce the noise level</li> </ol>	Plantation areas, facility development location at plantation and Palm Oil Mill	Throughout land opening and clearing period, mobilization of equipment and material, development of plantation facilities	Plantation manager and Sustainability Manager

No	Significant Environmental Aspect		Benchmark	Management Objective	Environmental Management Plan	Location	Period	Person in Charge
	Environmental Component/ Parameter	Aspect (Source)						
d	Physical & Chemical characteristic of Soil	Land clearing dan opening, and nursery activities	Physical & Chemical characteristic of Soil according to Keputusan Menteri Negara Lingkungan Hidup No: 28 tahun 2003 dan Nilai kesuburan tanah Pusat Penelitian Tanah dan Agroklimat Departemen Pertanian tahun 1983	To ensure land opening does not change the original state of physical and chemical characteristic of the soil	<ol style="list-style-type: none"> <li>1. Implement good seedling fertilization practice – timely application, correct dosage, correct type and point of application</li> <li>2. Develop early warning system for detection of erosion and sedimentation</li> <li>3. Arrangement and technique of land opening and clearing have taken into consideration of the seasonal factor</li> <li>4. Planting of legume cover crop</li> <li>5. Maintain natural forest area along the river – 50m on both sides of the river</li> </ol>	Plantation areas, and nursery location plan	Throughout land opening and clearing, and nursery operation period.	Plantation manager and Sustainability Manager
e	Erosion	Land clearing dan opening activities	Maximum limit for soil erosion and critical erosion level	No shallowing of rivers in the plantation development area due to sedimentation effect which exceeded the maximum limit for soil erosion and dangerous erosion level ( <i>tingkat bahaya erosi</i> )	<ol style="list-style-type: none"> <li>1. Planting of legume cover crop in bare/open areas</li> <li>2. Construct erosion and sedimentation observation plots in the plantation area for periodic monitoring and measurement – weekly. This include recording and observation of rainfall data in the plantation.</li> </ol>	Plantation blocks where the tributaries of river pass through	Throughout land opening and clearing period.	Plantation Manager
f	River water quality	Facility Development activities at Palm Oil Mill	River water quality as per PP no 82 tahun 2001	Total dissolved solids of river water does not exceed the PP No. 82 tahun 2001 regulation	Planting and maintenance of legume cover crop at river riparian areas to serve as erosion protection areas	Palm Oil Mill area and riparian areas along river	Throughout land clearing, and facility development period of plantation and Palm Oil Mill	Plantation manager and Sustainability Manager
g	Flora & fauna	Land clearing dan opening activities	Conservation of biodiversity and population of flora and fauna	To ensure biodiversity and population of flora and fauna are not destroyed entirely	<ol style="list-style-type: none"> <li>1. Set aside conservation areas along river riparian and relatively good forest areas</li> <li>2. Plant local species at the Palm Oil Mill compound</li> </ol>	Plantation area	Throughout land opening and clearing period.	Plantation manager and Sustainability Manager
h	Potential Fire at	Land clearing	Increase in biomass	Biomass that is	<ol style="list-style-type: none"> <li>1. Practice zero burning for land</li> </ol>	Plantation area	Throughout land	Plantation



No	Significant Environmental Aspect		Benchmark	Management Objective	Environmental Management Plan	Location	Period	Person in Charge
	Environmental Component/ Parameter	Aspect (Source)						
	Development Area	dan opening activities	(flammable) production	accumulated is safe, and does not catch fire easily especially during drought	<p>opening</p> <ol style="list-style-type: none"> <li>2. Develop standard operating procedure (SOP)</li> <li>3. Protect and to ensure sustainable use of water reservoir.</li> <li>4. Construct fire breaks around the plantation boundary</li> <li>5. Install prohibition/awareness/reminder signboards</li> <li>6. Increase awareness of the work unit</li> <li>7. Prepare self- warning system</li> <li>8. Prepare a water truck for fire-fighting purpose</li> <li>9. Prepare heavy machinery and radio communication</li> <li>10. Construct fire monitoring tower</li> <li>11. Develop communication and coordination</li> <li>12. Conduct plantation block demarcation</li> <li>13. Involve communities in management of disaster</li> <li>14. Develop and preserve nearby water source</li> </ol>	that is being opened	opening and clearing period.	manager and Sustainability Manager
<b>Operational Phase</b>								
a	Micro weather	Plantation development activities	Increase in air temperature and humidity after development of plantation – to return to its original state	Air temperature and humidity inside plantation area will revert to its origin state	Planting of legume cover crop especially immediately after land opening and clearing. To ensure that the area is not bare for too long	Plantation blocks area.	Throughout land opening and clearing period.	Plantation Manager
b	Gas and odour	Processing of Fresh Fruit Bunches (FFB)	Dust Parameter (PM <sub>10</sub> ) dan gas (SO <sub>2</sub> ,CO,O <sub>3</sub> dan	To minimize the dust concentration (PM <sub>10</sub> ) and gas (SO <sub>2</sub> ,CO,O <sub>3</sub>	<ol style="list-style-type: none"> <li>1. Install filter at the Palm Oil Mill chimney</li> <li>2. Prevent felling of trees along the river</li> </ol>	Damaged, dusty and non-asphalt roads used by	Throughout the Fresh Fruit Bunches processing and	Palm Oil Mill Manager

No	Significant Environmental Aspect		Benchmark	Management Objective	Environmental Management Plan	Location	Period	Person in Charge
	Environmental Component/ Parameter	Aspect (Source)						
		and transport of Crude Palm Oil	NO <sub>2</sub> ) emission level are within the PP No 41 regulation	dan NO <sub>2</sub> ) emission originating from processing of Fresh Fruit Bunches, transport of Crude Palm Oil and effluent treatment as to ensure they don't exceed the ambient air standard	<ul style="list-style-type: none"> <li>3. Ensure periodic maintenance is carried out on all equipment, especially those which emit gas and dust during operation</li> <li>4. Control/reduce the speed of vehicles transporting equipment and material, especially on dusty and non-asphalt roads</li> <li>5. Conduct water spraying in dusty areas</li> <li>6. Use good condition equipment</li> </ul>	heavy machineries and transportation of material, facility development location	transportation of CPO activity period	
c	Physical & Chemical characteristic of Soil	Plantation development and maintenance activities	Keputusan Menteri Negara Lingkungan hidup nomor 28 tahun 2003 dan Nilai kesuburan tanah Pusat Penelitian Tanah dan Agroklimat Departemen Pertanian tahun 1983.	To ensure all plantation development and upkeeping activities do not lead to physical and chemical changes of the ground from its original state	<ul style="list-style-type: none"> <li>1. Implement good seedling fertilization practice – timely application, correct dosage, type and placement of application</li> <li>2. Develop and implement environmentally friendly plantation development and management Standard Operating Procedures (SOP)</li> <li>3. Plant legume cover crop</li> <li>4. Utilize Empty Fruit Bunches for mulching</li> </ul>	Plantation Area	Throughout the Fresh Fruit Bunches processing and transportation of CPO activity period	Plantation manager and Sustainability Manager
d	River water quality	Plantation maintenance and processing of FFB	PP Nomor 82 tahun 2001	Water quality of River does not exceed the PP Nomor 82 tahun 2001 regulation	<ul style="list-style-type: none"> <li>1. Install effluent treatment plant at Palm Oil Mill</li> <li>2. Ensure implementation of good fertilization practice – timely application, correct dosage, type and placement of application</li> <li>3. Improve the fertilizer and pesticides usage efficiency, for plant upkeep</li> <li>4. Develop and implement environmentally friendly plantation development and management Standard Operating Procedures (SOP)</li> </ul>	Plantation Area and Palm Oil Mill (FFB processing), river passing through the plantation	Throughout the Fresh Fruit Bunches processing and transportation of CPO activity period	Plantation manager and Sustainability Manager
e	Ground water	Utilization of	Peraturan Menteri	Ground water quality	<ul style="list-style-type: none"> <li>1. Arrange the utilization rotation</li> </ul>	Plantation Area	Throughout the	Plantation

No	Significant Environmental Aspect		Benchmark	Management Objective	Environmental Management Plan	Location	Period	Person in Charge
	Environmental Component/ Parameter	Aspect (Source)						
	quality	effluent for Land Application	Nomor 907 /MENKES/SK/VII/2002 and Keputusan Menteri Negara Lingkungan Hidup Nomor 28 tahun 2003	does not exceed the Peraturan Menteri Nomor 907 /MENKES/SK/VII/2002 and Keputusan Menteri Negara Lingkungan Hidup Nomor 28 tahun 2003, requirement	<ul style="list-style-type: none"> <li>according to ground permeability and amount of effluent to be treated</li> <li>2. Construct effluent channeling system at areas where it is not permeable</li> <li>3. Install effluent treatment system</li> <li>4. Determine location for land application as per regulation</li> </ul>		Fresh Fruit Bunches processing and transportation of CPO activity period	Manager and Palm Oil Manager
f	River water flow	Plantation upkeep activities	River water flow of river experiencing high fluctuation	To ensure river water flow does not experience high fluctuation	<ul style="list-style-type: none"> <li>1. Utilize river water and to build water retention ponds if necessary</li> <li>2. Efficient utilization of river water</li> <li>3. Construct water reservoir</li> <li>4. Maintain river riparian</li> </ul>	Plantation Area	Throughout the plantation upkeeping period	Plantation Manager

### 4.3. HCV-HCS Management Plan

#### Threat assessment

Threats in HCV-HCSA Assessment are assessed applying the approach of IUCN Threat Classification Scheme (based on Salafsky *et al.*, 2008). This approach was developed to facilitate identification of threats and their sources. Once threats and their sources are identified, assessment is carried out towards potential impacts and risks for each area along with HCV and HCS elements they contain. Further, weighing is performed to identify, which threats should be made priority, to which management and monitoring planning will be referring to.

Based on threat identification (**Table 45**), in general there are four groups of major threats to conservation areas, i.e. threats to river (and their banks), forest-related forest, and cultural reserve-related threats. For river-related HCVs, their biggest threat is water pollution out of agrochemical residuals from plantation and farms. For forest-related HCV, threats come from poaching and logging activities as well as land fires. Threats of logging activities and land fires are also faced by HCS. Lastly, cultural reserve-related HCVs face threats out of the potential landuse change although the level of threats is not too high.

**Table 45.** The presence of important values and their threats

Value	Summarised important values in the assessment area	Current threat	Potential threat
HCV 1	Population of endemic or RTE flora and fauna species	<ul style="list-style-type: none"> <li>• Logging and land clearing</li> <li>• Poaching</li> <li>• Chemical pollution</li> </ul>	<ul style="list-style-type: none"> <li>• Forest fire: immense land fires such as that in 1997/1998 could happen again</li> </ul>
HCV 3	Lowland mixed dipterocarp forest, freshwater swamp forest and riparian ecosystems.	<ul style="list-style-type: none"> <li>• Forest encroachment</li> <li>• Chemical pollution</li> </ul>	<ul style="list-style-type: none"> <li>• Forest fire: immense land fires such as that in 1997/1998 could happen again.</li> </ul>
HCV 4	<p>Presence of naturally vegetated rivers and their riparian areas/riparian forests.</p> <p>Pris swamp, Medang swamp and Lake Timuran having functions as flood regulation and natural firebreaks.</p> <p>Bank of Pris swamp functioning as erosion and sedimentation control.</p> <p>Pollination services; habitats to pollinating agents.</p>	<ul style="list-style-type: none"> <li>• Land clearing for farms by River Bongan, Bongan Kiri, Bongan Kanan, Derungan, Arung, Piungan and Meliau, and Gusik.</li> <li>• Land clearing for oil palm plantation around Pris swamp bank may increase sedimentation, hence increased risk of flood.</li> <li>• Agrochemical pollution in Medang swamp because of other plantation companies' activities to the west of PT PBJ concession.</li> <li>• Land burning for fishing around Medang swamp.</li> </ul>	<ul style="list-style-type: none"> <li>• Planned land clearing in the upstream area of Bongan Kiri for industrial plantation forest business.</li> <li>• Planned expansion and land clearing for oil palm plantations to the west of River Bongan Kiri and in the southern part of PT PBJ concession may lead to increased sedimentation in River Bongan Kiri.</li> <li>• Waste and agrochemical leak from other company's oil palm mill to the west of PT PBJ concession.</li> </ul>
HCV 5	Medang swamp is community's fishing ground to meet their needs for protein.	<ul style="list-style-type: none"> <li>• Water pollution in Medang swamp due to other oil palm plantation company's agrochemical application activities to the west of PT PBJ concession.</li> <li>• Other company's land clearing for oil palm plantations around Medang swamp.</li> <li>• Land burning for fishing around Medang Swamp</li> </ul>	<ul style="list-style-type: none"> <li>• Waste and agrochemical leak from other company's oil palm mill to the west of PT PBJ concession.</li> </ul>
	River Bongan, Bongan Kanan and	<ul style="list-style-type: none"> <li>• Land clearing for farming, that</li> </ul>	<ul style="list-style-type: none"> <li>• See threats to HCV 4 relating</li> </ul>



Value	Summarised important values in the assessment area	Current threat	Potential threat
	Bongan Kiri as community's source of water	may deteriorate water quality (see <i>threats to river-related HCV</i> )	<i>to river</i>
	Fruit garden in Muara Gusik Village	<ul style="list-style-type: none"> <li>• Very low, or relatively absent, threats from fires and landuse change because community maintains the area.</li> </ul>	<ul style="list-style-type: none"> <li>• Uncontrolled fires around fruit gardens.</li> <li>• Landuse change by community because of shifting social perception.</li> </ul>
HCV 6	Sites of Batu Beranak, Albogeq Sacred Tomb, Mas'ud Sacred Tomb, Gunung Nusa Sacred Tomb and others.	<ul style="list-style-type: none"> <li>• Land clearing around the sites and sacred tombs.</li> <li>• Local knowledge on these sites starts fading away.</li> </ul>	<ul style="list-style-type: none"> <li>• Less and less respect for the sites.</li> </ul>
HCS	Forest-covered areas.	<ul style="list-style-type: none"> <li>• Logging.</li> <li>• Land clearing and landuse change into farmlands.</li> </ul>	<ul style="list-style-type: none"> <li>• Land fires.</li> </ul>

### Management and Monitoring Plan

The HCV-HCS management and monitoring plan is designed for three years. At the end of each year, there will be a formative evaluation (annual evaluation) which will be followed by a summative evaluation (final evaluation) at the end of the 3<sup>rd</sup> year; and throughout the implementation, a periodic monitoring will be carried out. Monitoring and evaluation are carried out to obtain the lessons learned as a feedback for the improvement, both plans and implementation, of the HCV-HCS management on the next period (continuous improvement and adaptive management).

The HCV and HCS element management aims at protecting the elements and areas from damage and maintain and enhance the values or functions. Threat assessment has provided options for actions to take to mitigate the threats to conservation areas.

Total area of HCV Management Area (HCVMA) is 2,076.61 ha which is the combination of HCV 1, HCV 3, HCV 4, HCV 5 and HCV 6 Management Areas as well as HCS forest (**Figure 36**). Generic management that applies to each HCV and HCS area includes: (i) HCV and HCS area gazettement; (ii) information dissemination to stakeholders; and (ii) capacity building for the HCV and HCS area's managing unit. Collaboration and engagement with community and neighbouring companies are also necessary in implementing conservation area management activities.

The generic management is as follow.

1. Conservation area gazettement with the following phases: field delineation over draft map of HCV-HCS areas, verification of the delineation output, and gazettement of the final output as the final conservation map, which is documented in a minute of HCV-HCS area delineation.
2. Demarcation by installing markers for conservation area (HCV and HCS) boundaries, followed by signboard installation. For rivers and swamp areas, boundary markers installation also includes the banks as the management area.
3. Disseminate information on conservation area management to and collaborate with:
  - a. the company's internal (field workers and staff, as well as partnership cooperative members);
  - b. local communities (land user, village governments and traditional institutions);
  - c. neighbouring companies (programme collaboration); and
  - d. relevant stakeholders (consultation).
4. Disseminate information to public on knowledge and understanding on HCV and HCS.
5. Sufficiently provide the information dissemination/Public Relations (PR) team with knowledge and materials including about FPIC phases, negative impacts and risks, impact and risk mitigation, and locations and area of potential area for oil palm plantation development.

As for management and monitoring plans specific by the HCV-HCS area type, this information is presented in an activity plan matrix (Table 46).

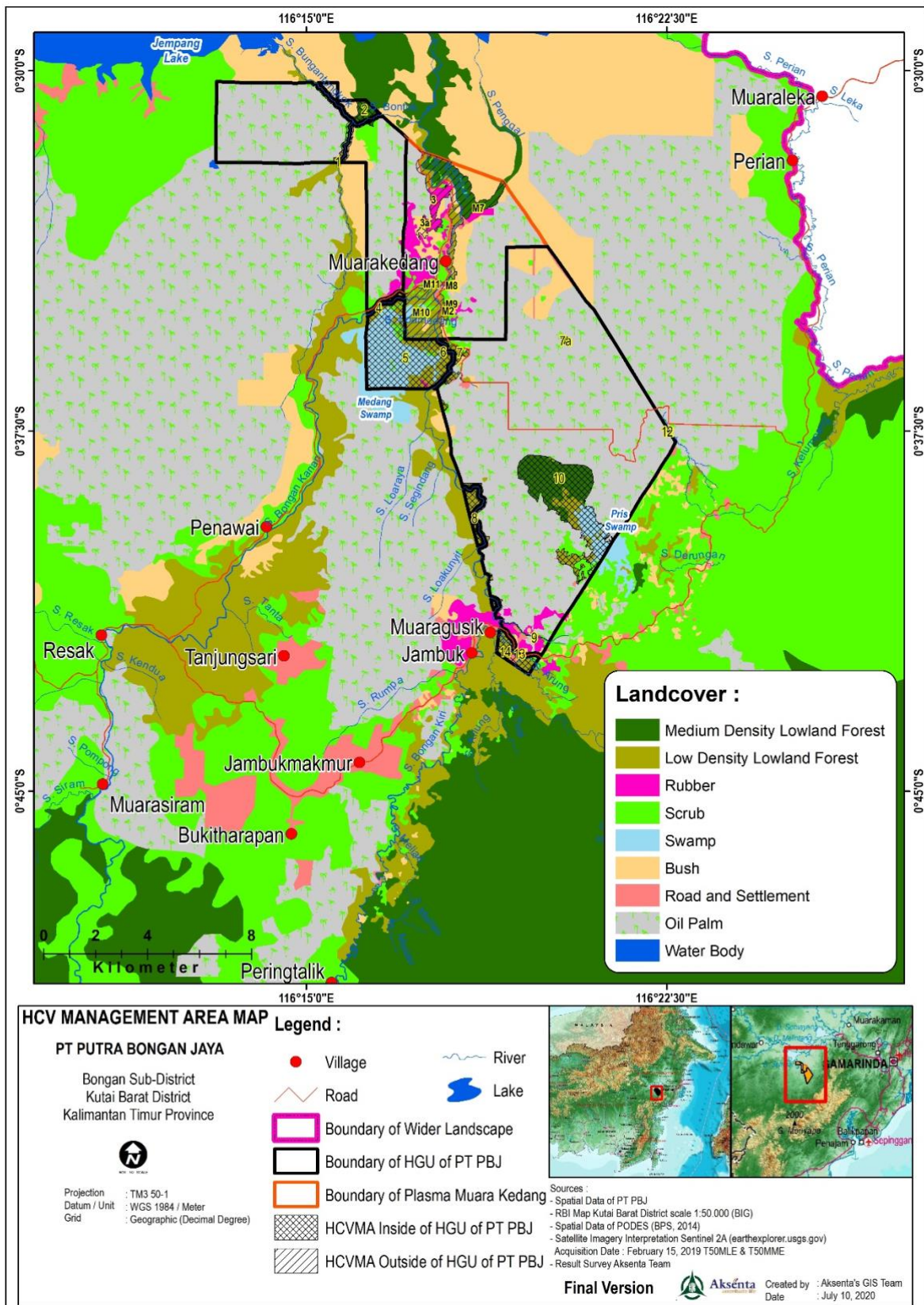


Figure 36 . Map of HCVMA in PT PBJ HGU concession

**Table 46.** Plan of HCV-HCS management and monitoring activities in PT PBJ operational area (2021-2023)

No.	Objective	Indicator	Baseline	Target	Management Activity	Monitoring	PIC
1	<b>Maintained river quality, quantity and continuity, and effectively functional riparian areas as hydrological (protection for soil and hydrological system) and ecological buffers.</b>	1.1 Water discharge 1.2 Water quality 1.3 Natural vegetation cover in riparian areas	1.1 Rivers within PT PBJ concession 1.2 Rivers flow year-round, but there is no baseline for the water's physical and chemical quality. 1.3 There are land clearing and burning because of farming activities in the riparian areas.	1.1 Maintained water level and discharge. 1.2 There is a baseline for water quality data. 1.3 There are neither land clearings in HCV areas nor land fires within PT PBJ operational area, including the HCV area.	1.1 Measure water quality at rivers' both inlets and outlets, especially Bongan Kiri and Bongan Kanan, and make it the baseline. 1.2 Install HCV information board and signboards for prohibition of poisoning and electrofishing 1.3 Establish boundaries for riparian buffer zone depending on the width of each river's riparian area. 1.4 Establish SOP for river normalisation mitigation to avoid damage to riparian ecosystems. 1.5 Control morpho- and soil erosion through civil engineering approach (using locally available materials such as timber, bamboo, rock or sandbags). 1.6 Revegetate riparian areas already cleared/degraded. 1.7 Disseminate information to community to avoid fishing that involves land burning and avoid land clearing in riparian and upstream areas. 1.8 Establish SOP for land fire mitigation and disseminate the information to staff/workers. 1.9 Establish fire control taskforce and coordinate with village governments, police and relevant government offices.	1.1 Monitor the level of river water discharge that comes in and out the area (at least once in a week). 1.2 Test the quality of water at the inlets and outlets of Bongan Kiri and Bongan Kanan (every six months). 1.3 Monitor buffer zone boundary markers (on a quarterly basis). 1.4 Monitor and map locations of streambank landslide (on a quarterly basis). 1.5 Install erosion gauge and monitor every six months. 1.6 Document the growth of revegetation plants (every six months). 1.7 Document information dissemination activity (annually). 1.8 Conduct fire control patrol (intensively during dry seasons) and document the activities.	Plantation manager and Sustainability Manager
2	<b>Safeguarded and preserved freshwater swamp area with hydrological and ecological functions</b>	2.1 Size of swamp area 2.2 Swamp water quality 2.3 Vegetation cover in riparian areas	2.1 Swamps located in PT PBJ operational area: Pris and Medang swamps. 2.2 Agrochemical pollution in Medang swamp because of other company's plantation activities to the west of	2.1 Size of inundated areas of Pris and Medang swamps do not get decreased. 2.2 There are no agrochemical pollutions. 2.3 There are no land fires.	2.1 Establish boundary markers for swamp areas and their banks and install signboards for prohibition of poisoning and electrofishing. 2.2 Liaise with all stakeholders, particularly with neighbouring companies, to prevent against and control water pollution in Medang swamp, 2.3 Measure water quality in Medang and Pris swamps 2.4 Facilitate the making of fish harvest regulations by season (dry/wet seasons).	2.1 Patrol swamp area boundaries and document the output (on a quarterly basis). 2.2 Test the quality of Pris and Medang swamp water (every six months). 2.3 Monitor buffer zone boundary markers (on a quarterly basis).	Plantation manager and Sustainability Manager



No.	Objective	Indicator	Baseline	Target	Management Activity	Monitoring	PIC
			PT PBJ concession. 2.3 Land burning for fishing around Medang swamp 2.4 Swamp banks currently covered by shrub and forest.	2.4 There are no land clearings in swamp banks.	2.5 Establish fire mitigation and control taskforce. 2.6 Provide the taskforce with facilities and infrastructures such as water truck and fire watchtowers. 2.7 Establish information board on land burning prohibition including Fire Danger Rating System. 2.8 Disseminate information to community to avoid fishing by burning lands and avoid land clearing in swamp banks. 2.9 Rehabilitate forests around Pris swamp including by planting fruit tree species that may provide foods to Müller's gibbon.	2.4 Document information dissemination activities (every year). 2.5 Conduct patrol (intensively during dry seasons) for fire mitigation and control and coordinate with village governments, police and relevant government offices. 2.6 Monitor the growth of revegetation plants and document the activity (every six months).	
3	<b>Safeguarded presence of rare and threatened flora and fauna species (RTE and protected species) in the HCV areas and they are able to reproduce.</b>	3.1 Wildlife species number and presence signs: sightings, footprint and voice. 3.2 Number of important flora species 3.3 Wildlings as the indicator that reproduction still takes place.	3.1 Key wildlife species: Proboscis monkey ( <i>Nasalis larvatus</i> ) and Müller's gibbon ( <i>Hylobates muelleri</i> ) as flagship species. 3.2 Key flora species: <i>Anisoptera laevis</i> ; <i>Dipterocarpus caudiferus</i> , <i>Dryobalanops</i> spp., <i>Hopea nervosa</i> , <i>Shorea bracteolata</i> , and <i>Shorea parvistipulata</i> .	3.1 Detected and well documented presence of key species (flora and fauna) 3.2 Key species can still reproduce.	3.1 Identify and map key species distribution locations (baseline) referring to the Integrated HCV-HCSA Assessment result as the baseline. 3.2 Disseminate information to local community on the presence of key wildlife species and the important meaning of their protection. 3.3 Prohibit any plantation staff and worker from poaching, selling and/or keeping RTE, endemic and protected species. 3.4 Appeal public to avoid poaching activities in the plantation areas and install poaching prohibition boards in HCV areas. 3.5 Facilitate village governments in making regulations on wildlife poaching. 3.6 In cooperation with relevant institutions such as Natural Resources Conservation Agency (BKSDA) and wildlife conservation NGOs, establish wildlife patrol team capable for mitigating conflicts with wildlife including animal rescue. 3.7 Design the direction of land clearing in the development area (non-conservation area) to allow wildlife to move towards the conservation areas (HCV and HCS areas) and disseminate	3.1 Monitor the presence of key species in their distribution locations (every 6 months). 3.2 Document any encounter or information on key species wildlings. 3.3 Document any information dissemination activity to staff/workers and community. 3.4 Patrol (on a quarterly basis) and document the activity. 3.5 Supervise contractor's land clearing activity and make the minutes or document the activity. 3.6 Coordinate with village governments, BKSDA and wildlife conservation NGOs, whenever wildlife individuals are to evacuate, and make the minutes.	Plantation manager and Sustainability Manager



No.	Objective	Indicator	Baseline	Target	Management Activity	Monitoring	PIC
					<p>this information to land clearing contractors.</p> <p>3.8 Make SOP for wildlife evacuation (e.g. when they get trapped in the plantation area).</p>		
4	<b>Lowland forest ecosystems in HCV-HCS areas remain intact and functional as refugia and corridors to wildlife species and as carbon stock</b>	<p>4.1 Natural vegetation cover</p> <p>4.2 Stand density as forest quality indicator.</p> <p>4.3 Wildlife species number and presence signs: sightings, footprint and voice.</p> <p>4.4 Vegetation number and species as carbon stock indicator.</p>	<p>4.1 Medium and low-density-secondary lowland forest cover.</p> <p>4.2 Presence of flora and fauna key species (see <i>Objective No. 3</i>).</p>	<p>4.1 Size of forest area does not get decreased and the stand density does not get lessened.</p> <p>4.2 Presence of key species are detected and well documented.</p> <p>4.3 Number and species of vegetation are well identified and documented.</p>	<p>4.1 Install forest area boundary markers and HCV-HCS information boards.</p> <p>4.2 Identify and map key species distribution locations (baseline) referring to the Integrated HCV-HCSA Assessment result as the baseline.</p> <p>4.3 Document any encounter or information on key species wildlife.</p> <p>4.4 Disseminate information to local community on the presence of key wildlife species and threatened ecosystems, as well as the important meaning of their protection.</p> <p>4.5 Establish permanent observation plot for vegetation analysis.</p> <p><i>See fire management activities in 'objective' column concerning rivers and swamp areas.</i></p>	<p>4.1 Monitor forest area boundaries and document this activity. Forest area size monitoring can also be carried out using remote sensing and spatial analysis approaches (on a quarterly basis).</p> <p>4.2 Monitor the presence of key wildlife species in their distribution locations (every six months).</p> <p>4.3 Monitor number and species of vegetation in permanent observation plots and make the document/report (every six months).</p> <p><i>See fire monitoring activities in 'objective' column concerning rivers and swamp areas.</i></p>	Plantation manager and Sustainability Manager
5	<b>Fruit/mixed garden remain intact and functional as local community's source of livelihood</b>	5.1 Use of fruit trees/Non-Timber Forest Products (NTFP)	5.1 Relatively maintained presence of fruit/mixed gardens because community maintains these areas	<p>5.1 Presence of fruit tree species are detected and well documented.</p> <p>5.2 A system mutually agreed with community is established concerning fruit garden use.</p>	<p>5.1 List plant species and NTFP products used by community.</p> <p>5.2 Facilitate mutual agreements on fruit garden use and NTFP product harvest.</p> <p><i>See fire management activities in 'objective' column concerning rivers and swamp areas.</i></p>	<p>5.1 Monitor the presence of plant species and NTFP products used by community and document the activity (every 6 months).</p> <p>5.2 Establish minutes of the mutual agreement.</p> <p><i>See fire management activities in 'objective' column concerning rivers and swamp areas.</i></p>	Plantation manager and Sustainability Manager

No.	Objective	Indicator	Baseline	Target	Management Activity	Monitoring	PIC
6	<b>Sites of historic and cultural values remain preserved and functional as local community's cultural/traditional identity</b>	6.1 Presence of historical and sacred sites.	6.1 Presence of historical and sacred sites is still dearly respected	6.1 Presence of historical and sacred sites is maintained and well managed. 6.2 Participatory management of historical and sacred sites.	6.1 List relevant stakeholders (beneficiaries, site manager, traditional institutions, village governments) and communicate on a regular basis (every year). 6.2 Document local knowledge over HCV 6 areas/sites. 6.3 On a participatory basis, establish HCV 6 site conservation plan and make mutual agreements between the company and community/relevant beneficiaries on HCV 6 technicality (including matters to do and avoid). 6.4 Engage guides during land clearing/replanting by contractor, which are the representatives of the relevant community member or beneficiaries so as to avoid damage or clearing of HCV 6 areas.	6.1 Document any process that includes relevant stakeholders concerning the presence of HCV 6 sites. 6.2 Make minutes of agreement in management of HCV 6 site. 6.3 Document land clearing activities around HCV 6 sites/areas known to community representatives/beneficiaries.	Plantation manager and Sustainability Manager

#### 4.4. Soil Management Plan

To efficiently manage the MU, 16 soil mapping units for lands on which oil palms will be planted can be grouped to form soil management groups and sub-groups. Each management group will consist of soils to which a set of management practices can be applied. A total of three soil management sub-groups can be identified in the Estate (**Table 47**). All of these three sub-groups are mineral groups.

**Table 47.** Soil Management Groups in the management unit of PT PBJ

Soil Sub-Group	Soil type	Management Practices
Af	Typic Kandiuult, Typic Kanhapludult, Typic Dystrudepts	<ul style="list-style-type: none"> <li>▪ Soil erosion monitoring and mitigation:               <ul style="list-style-type: none"> <li>• cover crop establishment.</li> <li>• terracing.</li> <li>• frond stacking</li> </ul> </li> <li>▪ Good fertiliser programme.</li> </ul>
Cdf	Histic Endoaquent, Typic Endoaquent, Aquic Dystrudepts, Organic Clay Muck	<ul style="list-style-type: none"> <li>▪ Drainage and flood mitigation.</li> <li>▪ Good fertiliser programme.</li> </ul>
Cf	Aquic Paleudult, Aeric Paleaquult, Typic Paleaquult	<ul style="list-style-type: none"> <li>▪ Drainage and flood mitigation.</li> <li>▪ Good fertiliser programme.</li> </ul>

#### 4.5. Management Plan for the Mitigation of GHG Emission

Mitigation and monitoring objects within the scope of new planting are divided into three categories as follow.

##### (1) Land clearing: HCS area conservation

This mitigation plan is realised in landuse plan for new planting and conservation. See **Table 48** and **Figure 37** for amount of land cover carbon stock to maintain in the conservation areas as a mitigation effort.

**Table 48.** Landuse and biomass carbon stocks in the company's operational area

Description of New Development Scenario			
Exclusion of HCV areas, HCS areas and community lands for conservation use. Land clearing for new planting development is only carried out in low carbon stock areas.			
Landuse and Biomass Carbon Stock		Area (ha)	C-Stok (Kilo tC)
Conservation use (HCV areas, HCS areas and community lands)	Low-Density Forest (HKR) (79.3 tC/ha)	464.68	36.85
	Young Regeneration Forest (HRM) (50.7 tC/ha)	639.06	32.40
	Shrub (BL) (24.0 tC/ha)	121.18	2.91
	Plantation Forest (Rubber Plantation) (45.0 tC/ha)	102.61	4.62
	Barren Soil (Bush and Inland swamp) (7.8 tC/ha)	702.29	5.48
	Others (Roads and Settlement Areas, and Water Bodies)	27.71	-
	Oil palm plantations set into conservation areas	19.08	-
<b>Total Conservation Area</b>		<b>2,076.61</b>	<b>82.25</b>
Planned new development	Low-Density Forest (HKR) (79.3 tC/ha)	0	0.00
	Young Regeneration Forest (HRM) (50.7 tC/ha)	0	0.00
	Shrub (BL) (24.0 tC/ha)	199.46	4.79
	Plantation Forest (Rubber Plantation) (45.0 tC/ha)	66.99	3.01
	Barren Soil (Bush and Inland Swamp) (7.8 tC/ha)	451.68	3.52
	Others (Roads and Settlement Areas, and Water Bodies)	63.9	-
	<b>Total Planned New Development Area</b>		<b>782.02</b>

## (2) Fuel consumption in plantation areas

GHG emission mitigation plan through fuel consumption plan will be implemented based on fuel consumption projection against the planned new plantation development. Therefore, landuse plan for GHG mitigation effort directly affects and is directly proportional to fuel consumption projection.

**Table 49.** Projected fuel consumption in the plantation area

No	Fuel Type	Annual Use per Hectare (litre/ha)	Total Annual Use (litre)*	Projected GHG Emission (tonne CO <sub>2</sub> e)
1	Diesel	430.7	315,830.63	985.39
2	Gasoline	0.0	0.0	0.0

Note: \* Total fuel consumption per year is calculated based on the size of the planned new planting area

## (3) Fertiliser application in plantation areas

GHG emission mitigation plan through fertiliser application planning is implemented based on the projected application taking into account types of fertilisers applied and size of the new planting area. Similar to the fuel consumption projection, fertiliser application amount is also directly affected by and directly proportional to the size of landuse for new planting.

**Table 50.** Projected application of fertiliser in the plantation area

No	Fuel Type	Annual application per hectare (tonne/ha)	Total annual application (tonne)*	Projected GHG emission (ton CO <sub>2</sub> e)		
				Transportation	N <sub>2</sub> O emission	CO <sub>2</sub>
1	Urea	0.13	101.66	147.07	289.91	74.55
2	MOP	0.09	70.38	21.58	-	-
3	GRP	0.18	140.77	21.20	-	-
4	Dolomite	0.14	109.48	11.67	-	-

Note: \* Total fuel consumption per year is calculated based on the size of the planned new planting area

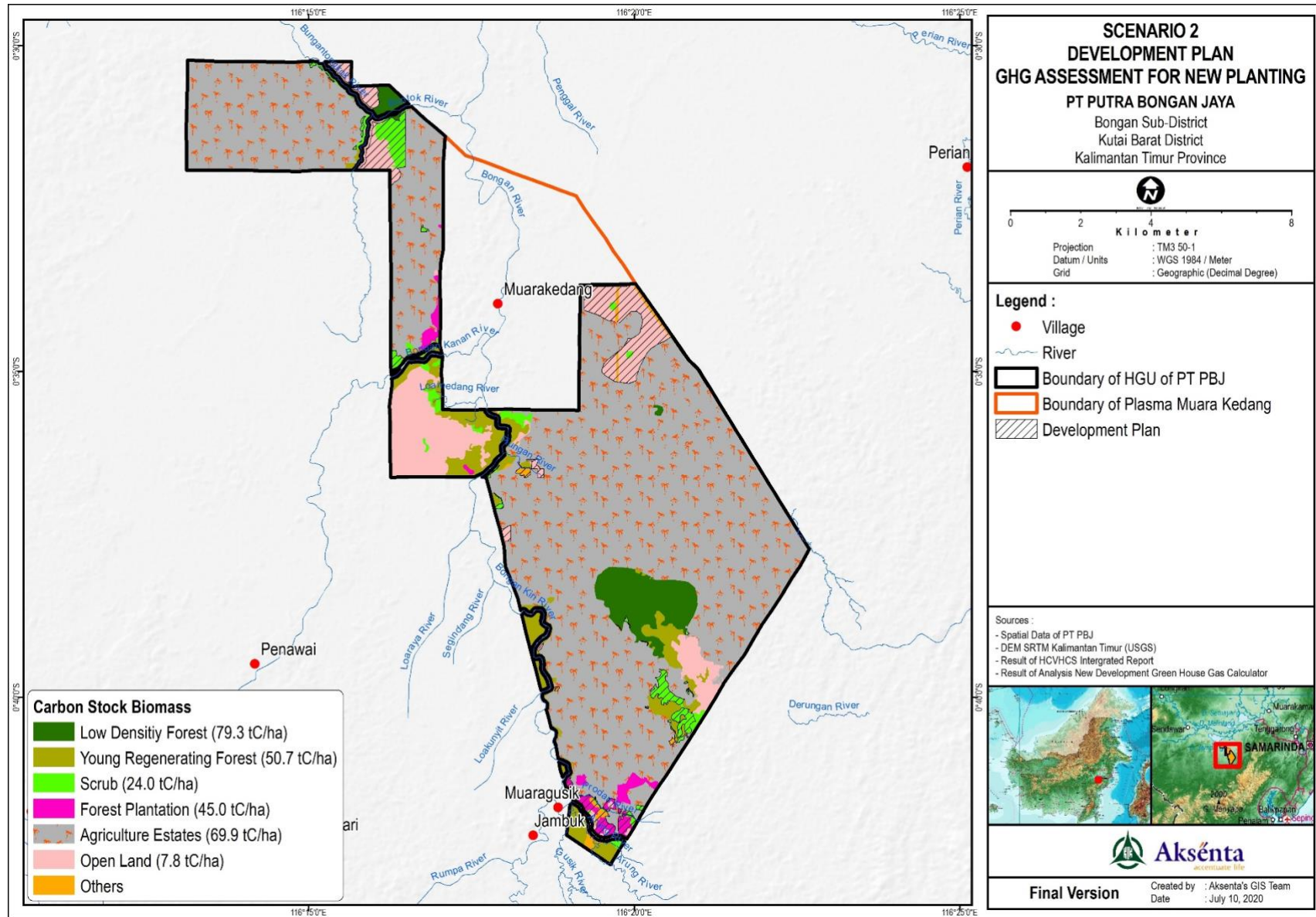
Based on the three GHG mitigation objects above, total nett amount of annual GHG emission of each component of emission source is projected to be -388 tonCO<sub>2</sub>e. In other words, the GHG fixation amount is larger than the emission amount. See **Table 51** for the projected GHG emission amount in the GHG mitigation plan implementation based on the scenario opted by PT PBJ management.

**Table 51.** Projected overall GHG emission per year and GHG mitigation plan implementation

Source of emission	Annual amount of emission (ton CO <sub>2</sub> e/year)
<b>Field Emission</b>	
Land clearing	1,734.06
Crop sequestration	-7,321.16
Fertilisers	276.08
N <sub>2</sub> O	782.03
Field fuel	985.39
Peat	0.00
Conservation credit	-5,191.53
<b>Nett Field Emission</b>	<b>-8,735.12</b>



Source of emission	Annual amount of emission (ton CO <sub>2</sub> e/year)
<b>Mill Emission</b>	
POME	4,390.26
Mill fuel	105.52
Purchased electricity	3,851.30
Credit (excess electricity exported)	0.00
Credit (sale of PKS for power)	0.00
<b>Nett Mill Emission</b>	<b>8,347.07</b>
<b>Net Emission from Field and Mill (tonneCO<sub>2</sub>e)</b>	<b>-388</b>
<b>Net Emission/Production (tonneCO<sub>2</sub>e/tonneCPO)</b>	<b>-0.06</b>
<b>Net Emission/Production (tonneCO<sub>2</sub>e/tonnePK)</b>	<b>-0.06</b>



**Figure 37.** Map of the planned development (scenario 2) for mitigating GHG in PT PBJ HGU concession

Mitigation and monitoring plans can be divided into two, i.e. generic and specific mitigation and monitoring plans. Generic GHG emission mitigation activities apply to all aspects within the company's operational scope, including components of source of GHG emission in palm oil production process. Successful implementation of generic mitigation activity will be recorded in regular documentation of management, e.g. reduced fuel consumption because of resetting the FFB transportation route and reduced use of fertiliser because of technological application. See below generic mitigation plans.

1. Manage fruit transportation route in the plantation.
2. Turn off vehicle machines when not used for transportation activity.
3. Save electricity consumption, particularly fuel-generated electricity.
4. Prevent fire.
5. Maintain and manage conservation areas.
6. Maintain and/or increase plant growth.
7. Apply new technologies supporting GHG emission mitigation efforts.
8. Apply use of alternative fuels that support GHG emission mitigation efforts.

At the phase of new planting development plan, the specific GHG emission mitigation plan is focused on landuse as the key variable that affects emission amount from other operational activities (FFB and palm oil production scopes). Mitigation plans for other operational activities are implemented through planning of measurable amount in use of emission-producing materials. In other words, the implementation of specific GHG emission mitigation and monitoring is specific and can be practically implemented and measured following the predetermined plans for landuse, and fertiliser and fuel consumption amount. See **Table 52** for specific GHG emission mitigation and monitoring activity plan.

GHG emission mitigation effort will be monitored by a working unit specialised based on the work scope. In this matter, mitigation plan relevant to the company can only be found in the scope of plantation operational activities. Furthermore, monitoring activities are integrated into the reporting system in the company's operational procedure standard to allow effective, efficient and practical implementation.

Evaluation activities are meant to update the next period's GHG emission mitigation and monitoring plans to correspond to the dynamics in the company's operational situation and condition. In the implementation, changes in the reference parameters such as (i) FFB supply amount; (ii) mill construction; (iii) POME management facility provision; etc. is likely so that the GHG emission mitigation and monitoring plans need to be kept updated.

Following the mitigation strategy, evaluation takes place in the last year within the implementation period (the 3<sup>rd</sup> year). GHG emission mitigation and monitoring plan evaluation and update is necessary based on the evaluation in the ongoing period as well as new projections by the company management. Complete data and information documentation from the monitoring is the key factor required in the evaluation. It is also possible to engage third parties to make the mitigation and monitoring plan evaluation and update process effective.

**Table 52.** Matrix of the planned GHG emission mitigation and monitoring activities in the scope of FFB production (plantation) in 2021-2023\*

No.	Objective	Indicator	Basic Data	Target	Timeline	Management Activity	Monitoring	Person in Charge
1	Protection for conservation areas (HCV and HCS areas).	<p>1.1 Maintained quality of stand canopy cover.</p> <p>1.2 Number of disturbances taking place.</p> <p>1.3 Condition of conservation area boundary markers and information boards in the field.</p> <p>1.4 Size of conservation areas.</p>	<p>1.1 Condition of conservation area boundary markers and information boards in the field.</p> <p>1.2 Photograph of stand canopy cover in conservation area monitoring locations.</p> <p>1.3 Minutes of disturbances found in conservation areas (e.g. fire, encroachment, etc.).</p> <p>1.4 Mapping of land clearing progress.</p>	<p>1.1 Zero reduction of stand canopy cover size in conservation areas.</p> <p>1.2 Sustainable reduction to elimination of number of disturbances in conservation areas.</p> <p>1.3 Avoid land clearing from entering conservation areas.</p>	Once in a year	<p>1.1 Safeguard conservation areas from any disturbance (fire, encroachment, etc.).</p> <p>1.2 Monitor any land clearing activities near conservation areas.</p> <p>1.3 Disseminate information on conservation area and their protection to workers, community and land clearing contractors.</p> <p>1.4 Establish and maintain conservation area physical boundary markers (demarcation) and information boards in the field.</p> <p>1.5 Safeguard conservation areas from contamination because of maintenance activities in plantation areas.</p>	<p>1.1 On a regular basis, monitor the conservation area boundary markers and information boards.</p> <p>1.2 On a regular basis, monitor land clearing progress.</p> <p>1.3 Photograph canopy stand cover in monitoring locations in the conservation areas.</p> <p>1.4 Monitor any threats and disturbances to conservation areas through regular patrol. This can also engage plantation workers and community.</p>	Plantation manager and Sustainability Manager
2	Oil palm biomass growth	<p>2.1. Plant health.</p> <p>2.2. Number of plants (in block).</p>	<p>2.1. Oil palm health survey data by block.</p> <p>2.2. Oil palm survey data by block.</p>	<p>2.1. Pest and/or disease attacks are under the normal limit.</p> <p>2.2. Dynamics of trunk number by block are under the normal limit.</p>	Once in a year	<p>2.1. Optimal plant maintenance</p> <p>2.2. Responsively and effectively avoid and/or deal with pest and disease attacks.</p> <p>2.3. Carry out thinning and/or supply when necessary to optimise oil palm growth</p>	<p>2.1. On a regular basis, survey palm health and make minutes for any pest/disease attack.</p> <p>2.2. On a regular basis, survey number of palm and make minutes for trunk thinning/supply.</p>	Plantation manager
3	Plantation area safety from fires	<p>3.1. Number of fire occurrence.</p> <p>3.2. Size of area that burns.</p>	<p>3.1. Minutes of fire.</p> <p>3.2. Inventorying of fire-affected areas/blocks.</p>	Sustainably reduce number of fire occurrence from the previous year.	Once in a year	<p>3.1. Deliver training and disseminate information on fire prevention and handling.</p> <p>3.2. Apply fire prevention action including fire patrol.</p> <p>3.3. Prepare pools or water sources in distributed locations in the</p>	<p>3.1. Disseminate information on fire prevention and handling.</p> <p>3.2. Patrol against fire hazard.</p> <p>3.3. Check water availability in the pools for firefighting.</p> <p>3.4. Organise the minutes of fire</p>	Plantation manager and Sustainability Manager



No.	Objective	Indicator	Basic Data	Target	Timeline	Management Activity	Monitoring	Person in Charge
						plantation to deal with fire. 3.4. Make minutes in case of fire.	documents.	
4	Fuel consumption in plantation operation	4.1. Amount of fuel consumption for plantation operation.	4.1. Amount of fuel consumption for plantation operation.	4.1. Optimal amount of fuel consumption in plantation operation for productivity.	Once in a year	4.1. Manage fuel consumption through fuel rationing. 4.2. Take generic actions for reducing vehicle fuel consumption (see generic mitigation activities).	4.1. Document fuel consumption. 4.2. Document plantation operational vehicles' mileage.	Plantation manager and Sustainability Manager
5	Fertiliser application	5.1. Amount of fertiliser application	5.1. Fertiliser application data	5.1. Optimal amount of fertiliser application for productivity.	Once in a year	5.1. Optimal application of fertiliser.	5.1. Monitor and regulate fertiliser application referring to the planned amount of application. 5.1. On a regular basis, document the dynamics of productivity (as the implication of fertiliser application).	Plantation manager and Sustainability Manager

(\* ) Assuming that land clearing for new planting is carried out in 2021. The implementation period can be adjusted to the company's planned year for land clearing.

## Formal Sign-off of Management and Mitigation Plan

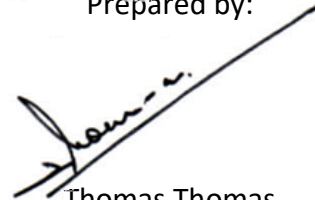
Management and Mitigation Plan has been prepared and approved by PT Putra Bongan Jaya management units.

Approved by:



Stephen Tiong  
(Head of Sustainability)  
Date: October 10, 2020

Prepared by:



Thomas Thomas  
(President Director)  
Date: October 10, 2020

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## 6. Internal Responsibility

### Formal Signoff by Assessor and the Company

This document is the Summary of Assessments for the New Planting Procedures for PT Putra Bongan Jaya (PT PBJ) concession under the company management.

#### Assessment Team



Idung Risdiyanto  
(Team Leader)  
Date: October 09, 2020

#### PT PBJ Management

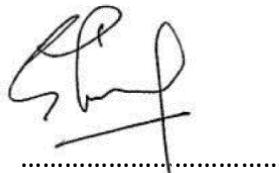


Stephen Tiong  
(Head of Sustainability)  
Date: October 10, 2020

### Statement of Acceptance of Responsibility for Assessments

Results of the Assessments on New Planting Procedures for PT Putra Bongan Jaya concession carried out by Aksenta will be applied as part of the guidelines to develop and manage PT PBJ management units.

#### PT PBJ Management



Stephen Tiong  
(Head of Sustainability)  
Date: October 10, 2020