

SUMMARY OF ASSESSMENTS AND MANAGEMENT PLANS

**Proposed New Plantings by PT Sariwana Adi Perkasa,
Papua Province, Indonesia**

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1. OVERVIEW AND BACKGROUND

1.1. Summary

A new development is proposed by PT Sariwana Adi Perkasa (PT SAP), a subsidiary of Goodhope Asia Holdings, Ltd. (Goodhope) located in the province of Papua, Indonesia.

As a member of the Roundtable on Sustainable Palm Oil (RSPO), Goodhope is committed to implementing sustainable management practices across its operations. The Group operates oil palm plantations in four provinces in Indonesia: Central Kalimantan, East Kalimantan, West Kalimantan and Papua. The two concessions in Papua (PT SAP and PT Nabire Baru) are located adjacent to one another to the East of Nabire town (Figure 1).

Based on Papua Province Spatial and Regional Planning (Rencana Tata Ruang dan Wilayah, RTRW), the area is classified as settlement area (from Nabire city to the east area of Wanggar River) and cultivation area (areas adjacent to Wanggar River) for plantations. The PT SAP concession is adjacent to Sima Village (Yeresiam Gua Indigenous Tribe).

PT SAP obtained its location permit from the Regent of Nabire through Nabire Decree No 218 (SK Bupati no 218/2008 date 30 December 2008) for 8,950 Ha area at Sima Village at Yaur District. The permit was extended through SK Bupati no 05/2011 dated 19 December 2011. In 2014, BPN granted Right of Land Use (HGU, Hak Guna Usaha) certificate for 6,437 Ha (SK Kepala BPN No.164/HGU/BPNRI/2014; SK Kepala BPN No.03/HGU/BPN.91/2015; and SK Kepala BPN No.05/ HGU/BPN.91/2015), which consists of 5,096.86 ha core area and 1,297.32 ha smallholders area (plasma).

Land clearance and planting of oil palm by PT SAP commenced in 2012 prior to RSPO membership but after verification processes by a Certification Body and followed the land-use plan of the first High Conservation Value (HCV) assessment. A total of 537.9 ha has been planted with oil palm (199.3 inti and 338.6 plasma).

In 2016 Goodhope suspended its plantation expansion operations due to concerns from external stakeholders: See [RSPO complaint against the operations of PT NB \(April 2016\)](#) and [precautionary approach \(stop work order\) - April 2017](#). A precautionary approach was adopted by implementing a moratorium on land clearance to avoid causing negative social and environmental impacts.

Continued efforts have been made to address environmental concerns, improve levels of mutual understanding and repair relations between the company and local communities. As part of the complaint resolution processes, Goodhope has addressed the allegations against PT NB and met requirements set by the RSPO Complaints Panel regarding the precautionary approach adopted (Stop Work Order).

The company completed new Social Impact Assessment (SIA); High Conservation Value (HCV) Assessment; Land Use Change Analysis (LUCA); High Carbon Stock (HCS) Assessment; Soil Assessment; and Greenhouse Gas (GHG) Assessment. Methods and findings for all assessments are presented in Section 2 and 3 of this report.

The HCV Assessment identified HCV 1, HCV 2, HCV3, HCV4, HCV 5 and HCV 6 in the assessment area, including viable populations of endangered, restricted range or protected species (6 Vegetation species, 4 Mammals and 30 Bird species), areas of peatland, lowland forest, mangrove and estuarine ecosystems. Species with cultural importance include Bird-of-paradise and Sago (*Metroxylon sagu*) and a number of sacred places and important sites for local culture have been identified.

A total of 4,545 ha is to be managed as conservation set-aside area (High Carbon Stock / High Conservation Value /peatland) as determined by new HCV assessment approved by HVRN and peer reviewed HCSA Assessment. Goodhope's Sustainability Policy has been communicated to local stakeholders to ensure cooperation in landscape level for conservation management.

Remediation liabilities and compensation liabilities for PT NB and SAP have been identified upon review of land use change analysis (LUCA) up to the date of the new HCV assessment. Remediation and compensation plan is under evaluation (concept note approved).

The stop work order for PT NB and PT Sariwana Adi Perkasa (SAP) has been lifted since 27th December 2018. Furthermore, the RSPO complaint against PT NB (lodged April 2016) has been closed for monitoring following community's withdrawal of the complaint in August 2018 and signing of MoU Community involvement.

Communities around the concession areas continue to place large hope for future income from plasma plantations and seek completion of plasma plantations. In this proposed plan for new plantings the company seeks to develop plasma plantations to fulfill its obligations to the communities, while maintaining commitments to no development on HCV areas, HCS forest or peatland.

In PT SAP concession, 949.41 ha has been identified for potential new plantings to provide plasma for local communities. The proposed new plantings are planned in accordance with the company's Sustainability Policy and RSPO New Planting Procedures. The proposed development areas are mineral soil, have not been classified as HCV area or HCS forest, and do not directly border protected areas.

Implementation of the planting plan will provide 1,487 ha of oil palm in the PT SAP concession. (199.3 inti and 1,288 plasma): 4,545 ha will be managed as conservation area (High Carbon Stock / High Conservation Value /peatland).

The proposed new planting plan depicts the maximum plantable area for the development. We indicate the potential land available for planting (949.41 ha) and a timeline for planting plan as required. However, the implementation of the development plans will be further confirmed through a due process to meet all operational and business standard requirements. The new development will be undertaken upon performing a consultative process with local community and other concerned stakeholders.

Table 1. Organizational information and contact persons

Name of RPSO member	Goodhope Asia Holdings Ltd.
RSPO membership number	1-0175-14-000-00
Date of joining RSPO	December 2, 2014
Name of subsidiary/management unit	PT Sariwana Adi Perkasa (SAP)
Country of subsidiary/management unit	Indonesia
Province and district of subsidiary/management unit	Yaur District, Kabupaten Nabire, Papua Province.
Total area of management unit (ha)	PT Sariwana Adi Perkasa area: Legal HGU: 6,437 ha (GIS 6,394.18 ha).
Contact person	Abrar Ramlan (abrar.ramlan@goodhope.co)

Table 2. List of Land Permits

No.	License and Recommendation	Issued By	Number	Note
1.	Deed of Establishment	Notary Agustina, SH	Act No. 11	5 th September 2008
2.	Location Permit	Head of Nabire Regency	No. 218 Year 2008 covering of 8.950 Ha Area	30 th December, 2008
			No. 5 Year 2011 covering of 8.950 Ha Area (Renewal)	19 th December, 2011
			No. 22 Year 2011 covering of 8,950 ha (Renewal)	28 th February, 2011
			No. 72 Year 2012 covering of 8.950 Ha Area (Valid until 24 July 2020)	24 th April 2014
3.	Plantation Business Permit (IUP)	Head of Nabire Regency	No 219 Year 2008	30 th December, 2008
			No. 6 Year 2011	20 th January, 2011
			No. 27 Year 2011	09 th March 2011
			No. 40 Year 2013	17 th April 2013

No.	License and Recommendation	Issued By	Number	Note
		Governor of Papua d/h Integrated Licensing Agency for Investment of Papua Province	No. 06/SK.IUP/KS/2014 covering of 8,950 Ha area	22 nd December 2014
4.	Environmental Permit	Head of Nabire Regency	No. 159 year 2014	15 th December 2014
5.	Land Use Title	National Land Authority	No. 164/HGU/BPN RI/2014 covering of 5,096.86 Ha for Inti (Nucleus) and 1,297.32 ha for scheme Smallholders (Plasma)	24 th October 2014

1.2. Location Map

PT SAP is located to the East of Nabire town in Yaur District, Nabire Regency, Papua Province, Indonesia. Yaur District is the westernmost district in Nabire Regency, and adjacent to Teluk Wondama Regency, Papua Barat Province.

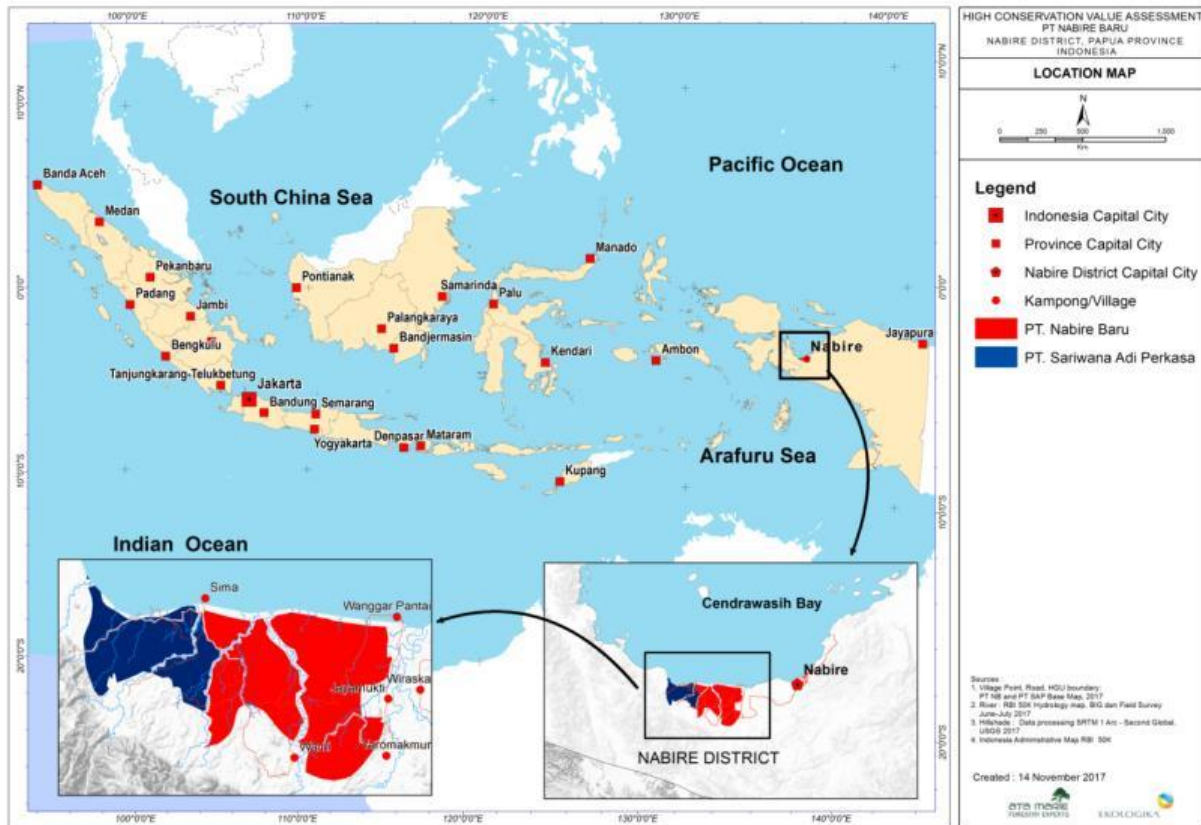


Figure 1. Location Map of PT Sariwana Adi Perkasa

1.3. General Description of the Landscape

PT SAP is situated at Non Forest Area (APL/Area Penggunaan lain). Based on Papua Province Spatial and Regional Planning (Rencana Tata Ruang dan Wilayah, RTRW), the area is classified as settlement area (from Nabire city to the east area of Wanggar River) and cultivation area (areas adjacent to Wanggar River) for plantations. According to Papua Province RTRW, production forest areas (HP, HPT and HPK) were included in cultivation area, while protected forest areas and marine reserve were established as protected area. Indicative Map of New Permit Postponement (PIPIB) revision 13 designated on December 4th, 2017 has shown that HGU of PT SAP area is outside of the Primary Forest area, Conservation Forest or Protected Forest. The Land Title (HGU) of PT SAP located in coordinate 135°11'0"-135°04'0" East dan 3°20'0"-3°29'0" South.

Figure 2 shows the land use zoning in the area surrounding PT SAP. The concession area is on 'Area Penggunaan Lain' (APL) land. Land to the east (from Nabire to S. Wanggar) is also APL and there are numerous villages in this area (ex. transmigrasi project villages). Land to the west of NB/SAP is zoned

for forest protection (HL). To the immediate south there is narrow strip of production forest and small patches of unallocated APL (other land use). The PT Jati Dharma Indah logging concession area (IUPHHK license) extends into the production forest areas. Steep mountains rise on average from 5km south of the southern boundary. These areas are zoned for forest protection (HL).

Geological Map 1:250.000 from Pusat Penelitian dan Pengembangan Geologi Bandung (Bandung Geological research Centre) in 1990, Pages Eranatoli and Kaimana shows that the location of Landscape PT SAP dominated by clay alluvial deposits (Qa) of Quaternary Age and Rocks of the Bumi Mudstone Formation (TQbm); and small of Paleozoic rock formations which are inseparable (Pzu) in the southwest side.

In general, the climate in the area and surrounding areas of PT SAP based on Schmidt and Fergusson, is classified as type A climate which is a wet tropical climate without dry month with natural vegetation of tropical rainforest. The wet months (> 100 mm / month) which is the rainy season in this area occurs almost all year round, the dry months (<60 mm / month) never occur because the dry months in this area are less than 60 mm /month. The last 10 years rainfall data (2007-2016) shows that the highest annual rainfall is 5,819 mm in 2010 and the lowest is 3,484 mm in 2014. The average air temperature during the period 2007-2013 ranges from 24.4 ° C. The maximum January temperatures during the day are 32.2 ° C and the minimum August air temperature at night at night is 15 ° C.

The Landscape area contains several ecosystem types, namely: (1) Lowland Forest on Plains, (2) Lowland Forest on Hills, (3) Mountainous Lowland Forest, (4) Lowland swamp Forest, (5) Mangroves and Estuarine and (6) Lowland Grassland on Plains.

PT SAP assessment area is adjacent to the area of Sima Village, Yaur District. Sima Village belongs to a Papuan indigenous tribe, Yerisiam Gua Tribe, which consists of four sub - Tribes (Waoha, Sarakwari, Akaba and Koroba) holding customary rights (hak ulayat).

Agricultural activities by local communities have not caused significant impact to land cover having been only conducted in micro scale at various locations, most located beyond permit area. Sago plants were cultivated in mangrove area near the coasts. Local communities are still dependant to natural resources, especially forest, river and sea to fulfill their livelihood needs and their traditional culture values.

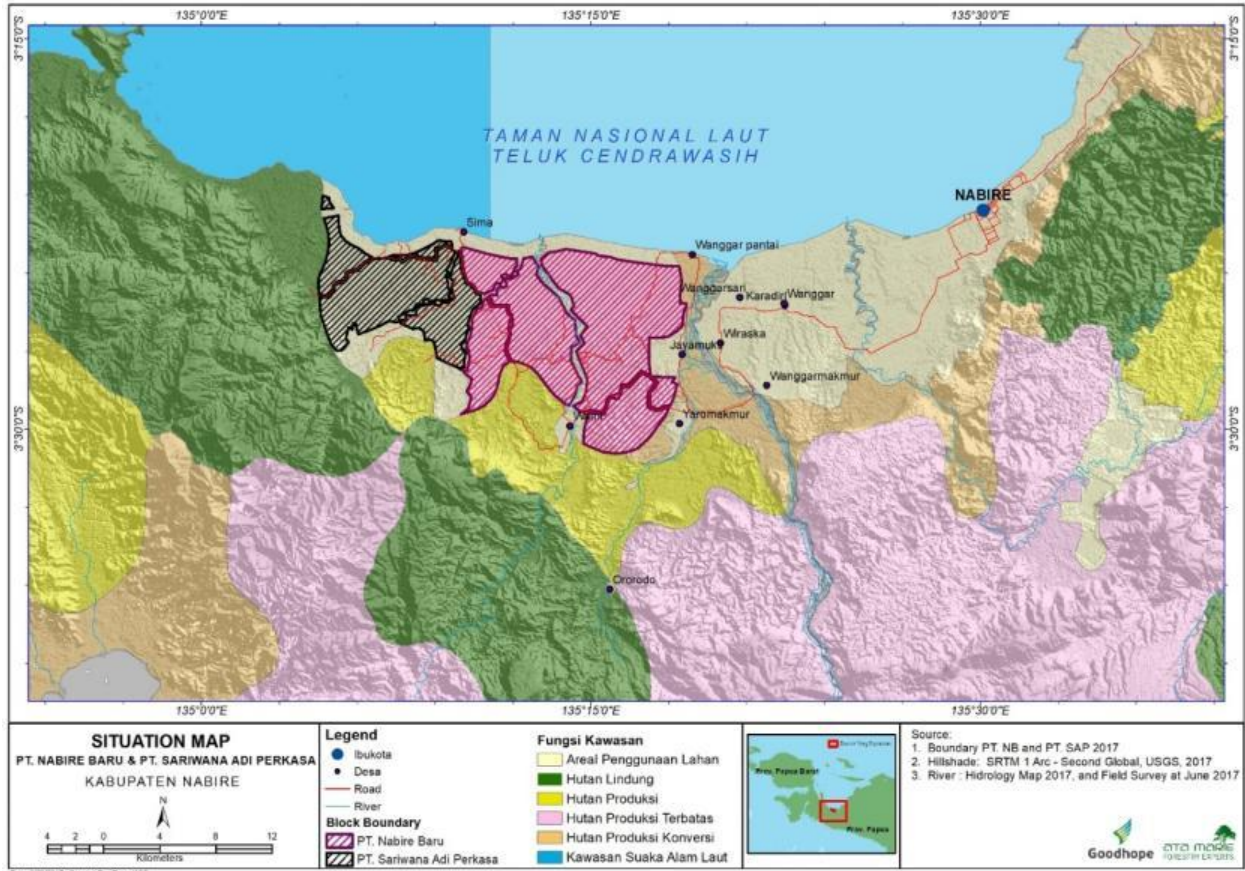


Figure 2. Land use zoning in area surrounding PT Nabire Baru and PT Sariwana Adi Perkasa

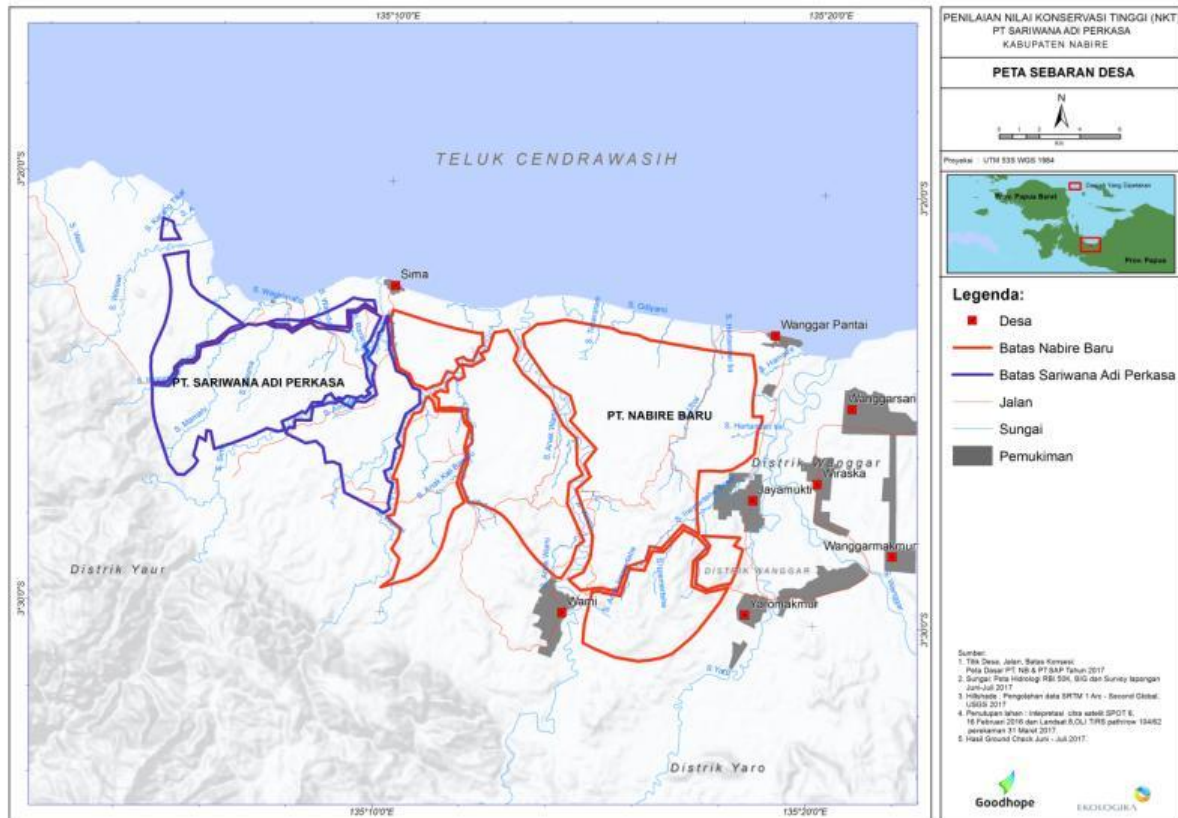


Figure 3. Point of Villages in and around PT Sariwana Adi Perkasa

The land cover of the landscape includes secondary forest, young regenerating forest, scrub, open land, agriculture, palm oil, infrastructure, settlement, road and water bodies, briefly described as follows (Figure 4):

- a) Secondary Forest (FOR): Subject to logging areas, both ex logging concession by coporations and small-scale logging by local community. The area dominated with vegetation from family myristicaceae, myrtaceae and residual dipterocarpaceae. Lowland forest with average above ground carbon stocks 77.6 tC/ha.
- b) Young Regenerating Forest (YRF): Subject to logging areas with heavier disturbance than in secondary forest. Vegetation dominated by species from myristicaceae and myrtaceae family. Starting to recover itself shown by pioneer species found such as *Macaranga sp* and *Vitex sp*. Average above ground carbon estimated 44.2 tC/ha.
- c) Scrub (SCR): Reverting early stage of recovering land after clearing. Pioneer species dominated in this land cover category such as *Macaranga sp*. Average above ground carbon estimated 8 tC/ha.
- d) Open land (OL): Predominantly ex logging areas scattered around concession. Assumed to be 0 tC/ha carbon stocks.
- e) Agriculture (AGRI): Shifting cultivation small areas along provincial road. Assumed to be 0 tC/ha carbon stocks.
- f) Palm Oil (PALM): Planted areas of PT Nabire Baru and Sariwana Adi Perkasa from 2011 to 2016. Estimated carbon stocks computed by year of planting. (are we giving this??)

- g) Infrastructure (IA): Company infrastructure and amenities inside concession. Assumed to be 5 tC/ha carbon stocks.
- h) Settlement (SET): Community habitation areas with 5 tC/ha carbon stocks estimated.
- i) Road (RD): Main road areas inside concession with 2.5 tC/ha carbon stocks estimated.
- j) Water Body (WB): Main river areas inside concession. Assumed to be 0 tC/ha carbon stocks.

All remaining forest areas in PT SAP have been subject to logging to some degree, both by logging concession operations in the past (between 1982-2001), and more recently (and ongoing) by small scale illegal logging operations. Beyond the concession area, the local landscape is highly forested.

PT SAP concession borders Sima Protected Forest in the west and Teluk Cendrawasih Marine National Park in the north. The protected forest in the west has relatively pristine habitat for several wildlife species in the area, such as cassowary (*Casuarius sp*) and Rangkong Papua (*Rhyticeros plicatus*), cuscus (*Spilocuscus sp*) and tree kangaroo (*Dendrolagus sp*). Black Spotted Cuscus (*Spilocuscus rufoniger*), a critically endangered species according to IUCN Red List, is also suspected present in the forest.

Teluk Cendrawasih Marine National Park is considered very important since it has a high level of endemic and threatened biodiversity, such as Whale Shark (*Rhincodon typus*), Green Sea Turtle (*Chelonia mydas*), Hawksbill Sea Turtle (*Eretmochelys imbricata*), Leatherback Sea Turtle (*Dermochelys coriacea*), Olive Ridley Sea Turtle (*Lepidochelys olivacea*), Dugong (*Dugong-dugong*), Ocean Sunfish (*Mola-mola*), Giant Clam (*Tridacna gigas*), as well as more than 1000 fish and 500 coral reef species.

The HCV Assessment identified HCV 1, HCV 2, HCV3, HCV4, HCV 5 and HCV 6 in the assessment area, including:

- Viable Populations of Endangered, Restricted Range or Protected Species (6 Vegetation species, 4 Mammals and 30 Bird species).
- Representation of natural species (the presence of cassowary, species of Accipitridae family, species of Ducula genus, lorries and cockatoo, Kangaroo, hornbill and bird-of-paradise).
- Rare, threatened, or endangered ecosystems, habitats (Mountainous Lowland Forest, Mangroves and Estuarine, Lowland Grassland on Plains and Water bodies/lakes).
- Areas that Contain or Provide Biodiversity Support Function to Protected or Conservation Areas (Western area of PT SAP which is directly adjacent to Sima protected forest).
- Ecotone between lowland swamp forest and lowland forest.
- Water bodies and water banks, mangrove and estuarine ecosystem, swamp forest Important for the Provision of Water and Prevention of Floods for Downstream Communities.
- Hilly area with Erosion Hazard Level value > 180 ton/ha/year Important for the Prevention of Erosion and Sedimentation
- Lowland forest, swamp forest, rivers and their waterbanks that Function as important Natural Barriers to the Spread of Forest or Ground Fire
- Area and natural resources fundamental for fulfilling basic needs, irreplaceable and traditionally/ sustainably managed by local people are present. Included are: Sources of carbohydrate, protein, vitamin, direct income, potable water for drinking and cooking, clean water for sanitation, craft materials, subsistent land, fuel, traditional medicine, building materials (timber and non-timber), fodder.

- A number of sacred places and Important sites for local culture
- Species with cultural importance: Bird-of-paradise Sago (*Metroxylon sagu*)

Several wildlife species in the area, such as cassowary and hornbill, are important in distributing seeds. Both species are at risk due to habitat loss. Some species of cuscus and tree kangaroo, which need good forest condition, will also be threatened due to more access, habitat changes and forest degradation. SAP plantation area is adjacent to protected forest in the west, which have relatively pristine habitat for aforementioned important species. Black Spotted Cuscus (*Spiloguscus rufoniger*), a critically endangered (CR) species according to IUCN Red List, is also suspected present in the forest. Local communities are still dependant to natural resources, especially forest, river and sea to fulfill their livelihood needs and their traditional culture values.

Soil studies identified 31 Ha of peat soil in PT SAP concession. The peat depth in assessment location variate from 6 -325 cm with percentage of organic soil maturity hamic (67%) and sapric (33%). Gravimetric method test was conducted to identify loss off ignition (LOI) indicated survey area in classified peat area with LOI <65% such as muck. Peat ground water level varied from 0 – 100 cm in the location of assessment area.

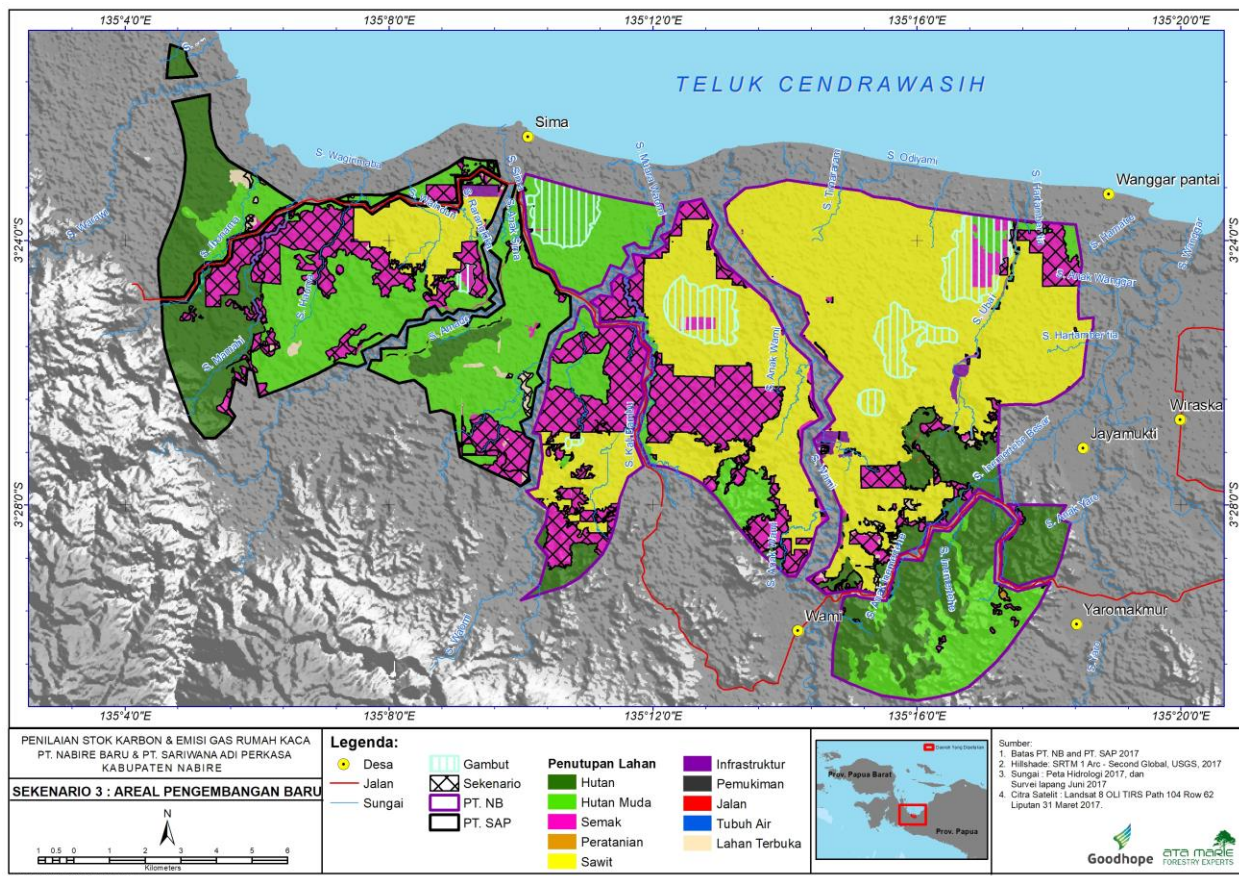


Figure 4. Land Cover and Peatland Distribution in PT NB and PT SAP concession areas

1.4. Proposed New Development Areas

The proposed plan for new plantings is intended to support the development of plasma plantations to fulfill existing commitments to the communities of Sima village for plasma plantation development.

In the PT NB/SAP concessions, there are four Plasma co-operatives each with a stand-alone HGU license granted by the government (Akaba 839 ha; Sarakwari 951 ha; Waoha 1,546 ha and Wate 872 ha). In total the plasma HGU areas cover 4,207 ha, of which 1,314 ha (31%) has been developed for plantations and related infrastructure.

Communities around the concession areas continue to place large hope for future income from plasma plantations and seek completion of plasma plantations. At Sima village, the community requested that apart from sago areas all plasma areas be developed including forested areas. At Wanggar village, the community requested that all plasma areas be developed including forested areas and that any plasma land that needs to be conserved (due to HCV/HCS/peat) should be replaced elsewhere.

Within the existing plasma boundaries, there is insufficient area of plantable land (nonHCV/HCS/peat) to support the development of plasma plantations. Therefore, in order to make up the deficit, the company proposes to provide plasma plantations on land that is currently in the company HGU permit.

In PT SAP concession, 949.41 ha has been identified for potential new plantings to provide plasma for local communities. The proposed new plantings are planned in accordance with the company's Sustainability Policy and RSPO New Planting Procedures. The proposed development areas are mineral soil, have not been classified as HCV area or HCS forest, and do not directly border protected areas.

Implementation of the planting plan will provide 1,487 ha of oil palm in the PT SAP concession. (199.3 ha inti and 1,288 ha plasma): 4,545 ha will be managed as conservation area (High Carbon Stock / High Conservation Value /peatland).

The proposed new planting plan depicts the maximum plantable area for the development. We indicate the potential land available for planting (949.41 ha) and a timeline for planting plan as required. However, the implementation of the development plans will be further confirmed through a due process to meet all operational and business standard requirements. The new development will be undertaken upon performing a consultative process with local community and other concerned stakeholders.

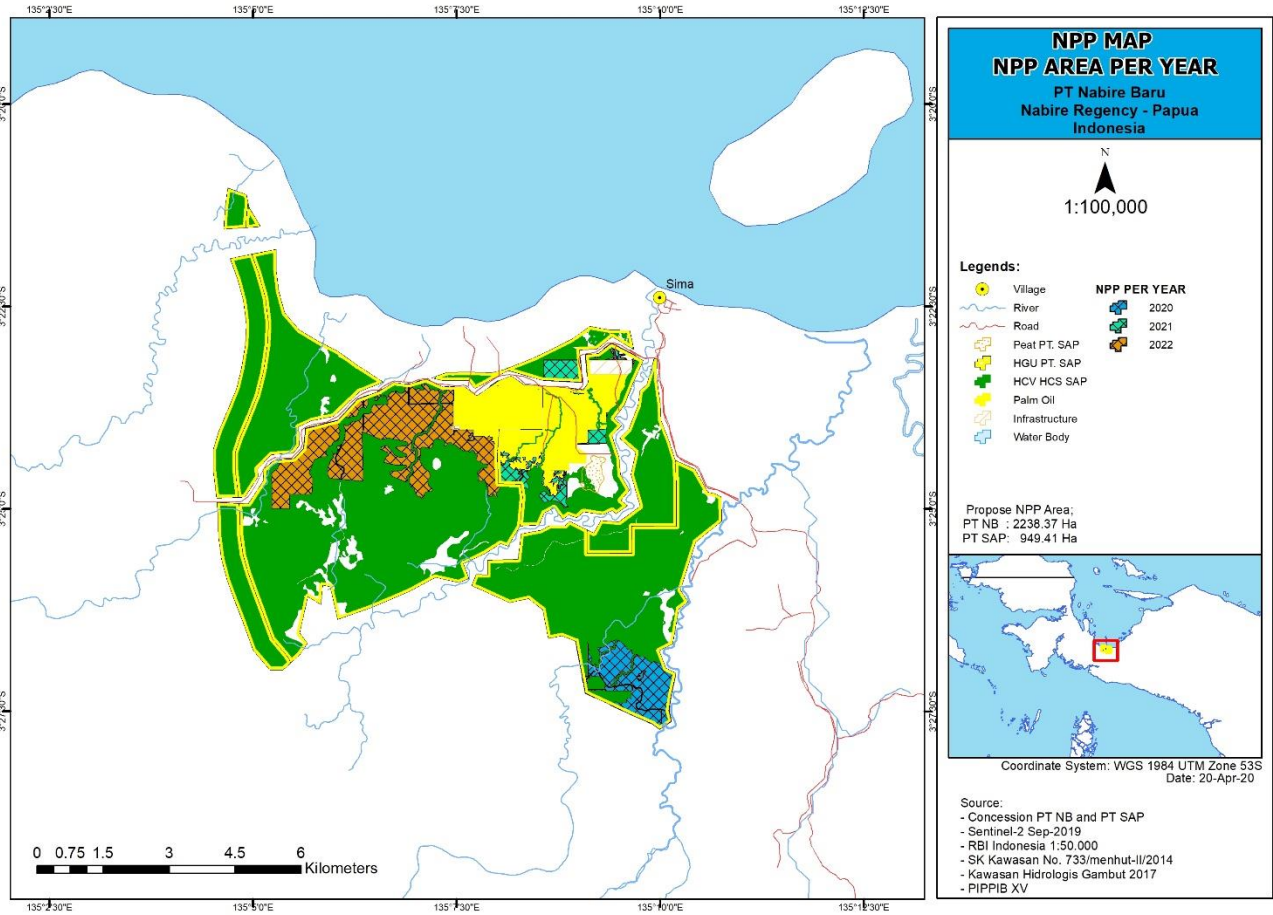


Figure 5. Map of Proposed New Planting by PT SAP showing Land Cover and Peatland Distribution

Table 3. PT SAP Proposed New Development Area and Conservation Area Plan

Soil Type	Land Cover	Proposed New Planting (Ha)	Proposed Conservation Area (Ha)
			HCV/HCS/Peatland
Mineral	Forest	-	1,557.4
	YRF	-	2,829.00
	Scrub	936,01	103.00
	Agriculture	0.28	-
	Oil Palm	-	-
	Infrastructure	-	-
	Road	-	-
	Settlement	-	-
	Water Body	-	-
	Open Land	13.12	59.00
	Sub Total	949.41	4,548.4
Peat	Forest	-	-
	YRF	-	8.00
	Scrub	-	-
	Agriculture	-	-
	Oil Palm	-	-
	Infrastructure	-	-
	Road	-	-
	Settlement	-	-
	Water Body	-	-
	Open Land	-	-
	Sub Total	-	8.00
	Total	949.41	4,556.4

Table 4. PT SAP Proposed New Planting Plan 2020 – 2022

Year	Planting Plan (Ha)
2020	218.76
2021	136.67
2022	593.98
Total	949.41

2. ASSESSMENT PROCESSES AND METHODS

2.1. Social and Environmental Impact Assessment

2.1.1. Dates of SEIA and Assessor Credentials

The EIA (AMDAL) of PT SAP was conducted by PT Widya Cipta Buana Consultant and was finalized on 15th December 2014. The team (Table 6) consisted of 16 persons and led by Drs Azis Rahman.

Table 5. The member of EIA (AMDAL) Consultant team with their expertise

Position	Assessor	Qualification
Team Leader	Drs. Azis Rahman	AMDAL A and B
Environmental technique and Water Quality Specialist	Dr. Rudi Laksmo, MS	AMDAL A
	Arie Fitria Indrayana, ST	AMDAL A
Air Quality and Noise Specialist	Drs. Iwan Setiawan	AMDAL A
Biologist	Drs. Bambang Kusharyadi	AMDAL A
	Haikal Suhaidi, Ssi	
	Hendra Mauri, Ssi, MSi	
Soil dan Agriculture Specialist	Ir. Yuswana	
Industrial Technique Specialist	Wawan Dermawan, ST	
Hydrologist, Geologist and Hydro-geologist	Ir. Djajin Prapto Rahardjo	
Planologist	Burhanudin , ST	
Public Health	Indri Aprialini, SKM	
Socio-Economic Specialist	Irba Djaja, SP, Msi	
	Ervan Supriyady	
Anthropologist	Dr. JR Mansoben	
	Yotam Senis	

The first SIA for PT Sariwana Adi Perkasa an completed in February 2011 by a team from the Faculty of Forestry at Bogor Agricultural University (Institut Pertanian Bogor, IPB) led by an RSPO-approved assessor. The update of SIA reports of PT SAP was conduct in March 2017 – February 2018 by Ekologika Consulting.

Table 6. Composition Team of PT SAP SIA March 2017 – February 2018

Name	Role	Expertise
Ninil Jannah (Pr)	Assessment Team leader, Social Advisor	EIA, SIA, landscape-livescape analysis, FPIC, participatory survey method, stakeholder engagement, ecosystem service, disaster risk management
Tia Mulyasari (Pr)	Project Manager	Forestry, forest product management, bioenergy, environmental baseline survey, HCS
Iswar Abidin (Lk)	Survey Coordinator, Social Survey Specialist	Policy & Development, SIA, Community Development, Disaster Management, Partisipative Rural Appraisal Specialist
Tri Setyadi (Lk)	Team member,	GIS, Forestry management, ecosystem service and

Name	Role	Expertise
	Participative Rural Appraisal Specialist	biodiversity surveys, Environmental Impact Assessments, High Carbon Stock Assessment, sustainable landscape based conservation
Sigit Purwanto (Lk)	Team member, Social Survey Specialist	Participatory survey methods, community engagement and development, community based disaster risk management
Okki Shahibussalam (Lk)	Team member, Social Survey Specialist	Participatory survey methods, community engagement and development , environmental education, conservation
Priadi Satriotomo (Lk)	Team member, Social Survey Specialist	Participatory survey methods, community engagement and development
Yanyan Hadiyana (Lk)	Team member, Social Survey Specialist	Participatory survey methods, community engagement and development , participatory mapping, environmental education
Hadi Dana (Lk)	Team member, Social Survey Specialist	Participatory survey methods, community engagement and development , environmental education
Asep Wahyu Suherman (Lk)	Team member, Participatory Mapping Specialist	Forestry Management, Environmental Services, Forest Inventory, Participatory survey methods

2.1.2. SEIA Methods

2.1.2.1. Review and Analysis of Secondary Data

The Social Impact Assessment uses secondary data to conduct data gap analysis by literature review and analysis of HCV social survey data / information that can be used for SIA assessment / report.

2.1.2.2. Primary Data Collection

The social impact assessment involves multiple stakeholders that have potential to be affected by activities within the assessment area. The participatory approach enables opportunities for stakeholders with an interest in the intended area to provide input and address issues related to the social impacts identified by the assessment team and inputs for the proposed management and monitoring.

Social impact assessment is conducted using landscape methods, where assessments are conducted in villages within the permit area and around the HGU area. Based on the following criteria: (a) the village within the location permit area, (b) the adjacent village that is very close to the location permit area and is potentially affected directly or indirectly from the company's operations / social impact management within a location permit, (c) a village located within a location permit area based on a watershed (DAS) / sub-basin and having other natural resource attachment from the HGU area. Based on these criteria, there are 1 (one) target assessment village.

Table 7. Village in and around PT Sariwana Adi Perkasa

No.	Village	District	Ethnicity
1	Sima	Yaur	Suku Yerisiam

Participatory Rapid Rural Assessment (PRRA) was conducted to assess social impacts in rural areas in a participatory manner with communities. The reasons for using this method are: (1) this approach puts the community as a subject who knows the conditions and problems in the region; (2) this approach is more able to provide "space" to the community from various social status and interests to convey aspirations; (3) this approach is also one of the media of learning and empowering the community about the condition and problems in the region.

In the stages of the implementation of the social impact assessment, stakeholder consultations are conducted at the village / village and district level. Stakeholder consultations are a consultative medium aimed at verifying the information gathered in the preparation and planning phases, collecting new information, assessing the validity or credibility of claims, seeking opportunities to reduce conflicts from management decision making and gathering inputs from various stakeholders for management and monitoring.

Some PRRA techniques used for collecting data are Focused Group Discussion (FGD), Semi-structured Interviews, and Observation (ground check) in the field, with the assessor position as "human instrument", triangulating data sources, and with members of the social assessment team on activities HCV assessment.

Table 8. Time Frame of Social Impact Assessment Schedule of SIA

No.	Stage	Location	Period
1	Preparation	Villages around company	Week IV March 2017
2	Field Survey 1: a. Scoping survey and obtaining assessment approval from indigenous community b. Survey- 1 (FGD) c. Survey- 2 (FGD)	Kampung Sima, Wanggar Pantai, Yaro makmur, Jaya Mukti, Wami	June – August 2017
3	Draft Report Social Survey	Jakarta	Sept – Nov 2017
4	Scoping visit and Preparation for Social Impact	Jakarta	January 2018
5	Survey-2 a. Questioner b. Interview and FGD	Kampung Sima, Kampung Sima, Wanggar Pantai, Yaro makmur, Jaya Mukti, Wami dan Kantor Unit Manajemen	January – February 2018
6	Report Writing (Draft)	Nabire	January – February 2018
7	Stakeholder Consultation	Hotel Mahavira 2, Kota Nabire	8 February 2018
8	Report Writing (Final Draft)	Jakarta	February – April 2017

2.2. HCV Assessment

2.2.1. Introduction

High Conservation Value (HCV) is biological, ecological, social or cultural value of outstanding significance or critical importance in local, national, regional or global level. Categories, definitions, and criteria to identify values are established globally by High Conservation Value Resource Network (HCVRN). RSPO voluntary certification standard stipulates HCV management in RSPO Principles and Criteria (2013) 5.2, 7.1, 7.3, and related to 2.2, 2.3, 6.3, and 6.4. “The status of rare, threatened or endangered species and high conservation value habitats, if any, that exist in the plantation or that could be affected by plantation or mill management, shall be identified and their conservation taken into account in management plans and operations.” (Criteria 5.2).

HCV approach divides HCV into six categories: (1) HCV 1 – Concentrations of species diversity, (2) HCV 2 – Landscape-level ecosystems and mosaics, (3) HCV 3 – Rare, threatened, or endangered ecosystems, habitats or refugia, (4) HCV 4 – Ecosystem services in critical situations, (5) HCV 5 – Community needs, and (6) HCV 6 – Cultural values. The assessment of this HCV uses definitions of HCV categories as per the Common Guidance for the Identification of High Conservation Values from HCVRN (2013), but applies HCV sub-category criteria for HCV identification as per the HCV Identification Guidelines for Indonesia 2009, to provide country-specific context.

Goodhope requested PT Ekologika Cosultants (Ekologika) as an independent assessor to conduct HCV re-assessment for PT SAP. The objectives of the HCV assessment are as below:

- 1) Evaluate and determine the existence of HCVs in the assessment area (concession area and its surrounding landscape), and to describe value condition, and potential threats.
- 2) Delineate the area that contains HCVs (HCVAs) to describe distribution, mobility, structure, composition and/or status of the values.
- 3) Provide recommendations for HCV management and monitoring, as well as set aside areas needed based on comprehensive knowledge of the area where HCV attributes are present, and focusing on efforts where HCV management area is needed within areas under direct influence of company or management unit, and other management needs.

2.2.2. Dates of HCV Assessment and Assessor Credentials

HCV Assessment at PT SAP was conducted by Ekologika. Summary information of team members is presented in Table 9. The re-assessment survey was conducted on March – October 2017.

Table 9. HCV Assessment Team

Team Member	Role	Expertise
Field Survey		
Ninil Jannah	Assessment Team Leader, Social Advisor (ALS16004NJ)	EIA, SIA, landscape-livescape analysis, FPIC, participatory survey method, stakeholder engagement, ecosystem service, disaster risk management
Iwan Setiawan	Assessment Alternate Team Leader	Wildlife Researcher and Surveyor, wildlife conservation, ornithologist, community facilitator, participatory mapping. Has been involved in HCV assessments since 2012

Team Member	Role	Expertise
Tri Setyadi	Biophysical Survey Leader, Ornithologist	GIS, Forestry management, ecosystem service and biodiversity surveys, Environmental Impact Assessments, High Carbon Stock Assessment, sustainable landscape based conservation
Tia Mulyasari	Biophysical Survey, Ecosystem Service Analysis	Forestry, forest product management, bioenergy, environmental baseline survey, HCS
Sigit Purwanto	Social Survey Leader	Participatory survey methods, community engagement and development, community based disaster risk management
Okki Shahibussalam	Social Survey	Participatory survey methods, community engagement and development, environmental education, conservation
Yanyan Hadiyana	Social Survey	Participatory survey methods, community engagement and development, participatory mapping, environmental education
Hadi Yana	Social Survey	Participatory survey methods, community engagement and development, environmental education
Khrisma Lekitoi	Biophysical Survey, Vegetation Expert	Vegetation Research and Surveys, Ecosystem conservation
Pieter Torobi	Biophysical Survey, Mammals Expert	Mammal surveys and conservation management
Dadi Ardiansyah	Geographical Information System, GIS Analyst	GIS, HCS, conservation management
Asep Suherman	Social Survey, Geographical Information System	Land Use and Land Cover Survey/Research
Priadi Satriotomo	Social and Biophysical Survey Assistant	Participatory survey methods, community engagement and development
Additional Support		
Alex Thorpe	Overseer, HCS Team Leader	Forest-ecology, sustainable landscape based conservation, HCS, GIS
Neville Kemp	Biophysical and Conservation Advisor	Biodiversity survey, ornithologist, forest-ecology, sustainable landscape based conservation, FPIC, participatory survey methods, community engagement and development.

2.2.3. HCV Assessment Methods

HCV Assessment is classified as rapid-survey with time and cost constraint. Furthermore, HCV assessment in this case is a re-do assessment – and not to review and update. Therefore, data from previous HCV assessment reports is used only as reference during desktop works and scoping. Following the scoping survey, assessor concluded that the involvement of experts/specialist for vegetation, mammals, bird, ecosystem service is necessary. They will work together in Biophysical Survey Team. Other than that, some social experts will also be involved in Social Survey Team.

Primary data was collected through field survey activities, which conducted to fulfill data gaps and verify secondary data obtained from various sources (demographic and area information from Statistic

Bureau, Meteorological Station, Geology Office, PT SAP and Goodhope), as well as informations obtained at scoping study during pre-assessment stage.

2.2.3.1 Biophysical Survey (HCV 1, HCV 2, HCV 3, HCV 4)

Survey was conducted using descriptive method with direct observation and survey techniques in areas represent each natural ecosystem type. Ecosystem types identified from land cover analysis and scoping survey are: (1) Lowland Forest on Plains, (2) Lowland Forest on Hills, (3) Mountainous Lowland Forest, (4) Lowland swamp Forest, (5) Mangroves and Estuarine and (6) Lowland Grassland on Plains. Transects were conducted in three dominant ecosystems: lowland forest ecosystem, swamp forest ecosystem, and mangrove and estuary ecosystem. Experts team did not conduct quantitative survey within plantation area since RTE species (threatened, endemic and limited distribution) usually are forest species that do not depend on plantation for their survival. However, if HCV species was found, it will be recorded.

A rapid inventory of vegetation, mammals and birds were conducted in each ecosystem type for a total of 14 days survey time.

Biodiversity (HCV 1-3)

1) Mammals- Data was collected using Visual Encounter Survey method (Hayer et al., 1994) combined with a modified Line Transect (one kilometer long). Observation time are 06.30-10.00, 16.00-18.00 and 19.00-22.00 (spotlighting). Mist-netting was not used. VES is advantageous in that the method covers more area (important due to low density of mammals in Papua). In the other hand, the drawback of this method is the possibility in omitting several species, especially rats and bats.

2) Birds- Data was collected using Line Transect method by Bibby et al. (2000), for 1 km.. Observation is conducted two times a day during high activity between 05.30-09.00 and 15.30-17.30, and from 18.00-20.30 at night for nocturnal birds. Mist-netting was not conducted because it requires more intensive work but produce less data than VES or sound.

3) Vegetation- Rapid vegetation assessment was conducted using a cruising method in transect lines (one kilometer long each), where assessor explore and collect samples from various locations that represent each ecosystem types or vegetation types in assessment area (Rugayah, 2004). The assessment is conducted in conjunction with a HCS forest inventory. Vegetation plot was not conducted because it requires more intensive work and quantitative data was not required to identify HCV species in the landscape.

Ecosystem Services (HCV 4)

1) Land cover ground-check to ensure the accuracy of forest cover data and to verify the existence of springs locations obtained through interview, which will be useful in determining important areas for ecosystem services.

2) Ground check to determine the conformity of slope condition with Universal Soil Loss equation (or erosion hazard level calculation) (Wischmeier and Smith, 1978).

3) Measuring water turbidity as erosion indication using secchi disk at several main rivers and tributaries.

4) Interview with local people to obtain information on lowest and highest water level.

Beside observation, HCV 1-4 data was also obtained through information gathering using techniques below:

- 1) Interview- Semi-structured interview with people encountered during observation to obtain information on the presence of wildlife and vegetation in assessment area. These people were selected based on assumption that since their activities are closely related to forest, wildlife and vegetation, they are more knowledgeable and more experienced.
- 2) Focus Group Discussion (FGD) - FGD with community members to obtain data and information on ecosystem services (HCV 4), wildlife and vegetation (HCV 1-3), and potential threat against HCV 1-4.

2.2.3.2 Social Survey (HCV 5, HCV 6)

Assessment is conducted in villages/kampungs within permit area and its surrounding, in specific: (a) kampungs inside permit area; (b) kampungs near permit area, potentially affected by or influenced operational activities/HCV management inside permit area, directly and indirectly, (c) kampungs near permit area, based on watershed/sub-watershed. Based on these criteria, only one kampungs identified as assessment target: Kampung Sima. It is located in distrik Yaur and outside SAP HGU area. Included in Kampung Sima are four customary holders sub-tribes of Yerisiam Tribe: Akaba, Koroba, Sarakwari and Waoha.

Data was collected using a combination of various tools/techniques, participatory survey approach and consultation with local communities to obtain demographic and socioeconomic information, and perception on locations/area and resources needed by the community (including traditional community).

Data collection techniques used included Key Informant Interview (a semi structured interview to village officials, priest, traditional leaders) and Interviews (relaxed semi structured interview to resource users and owners), as well as FGD, participatory mapping and ground checking to important areas identified. At least 3 FGDs and 2 ground checks were conducted. FGD participants consisted of representatives from women, youth, and livelihood groups.

2.2.3.3 Geographical Information System

Secondary data used are river network map, vegetation/land cover map, forest area map, ecosystem proxy map, hotspot map, geological map, soil map, road network map, SRTM Digital Elevation Model (DEM), SPOT 6, Landsat 8 satellite imagery and rainfall map. To determine land cover, interpretation of SPOT 6 and Landsat 8 satellite imagery were processed with supervised classification method – in accordance to land cover classification from High Carbon Stock Approach Toolkit10. DEM Data (CGIAR-Consortium for Spatial Information (CGIAR-CSI) ver 4.0) was analyzed to produce slope and altitude class. Soil map, rainfall map and slope map were used to calculate soil potential erosion (TBE, Tingkat Bahaya Erosi).

Data primer was collected to verify SRTM accuracy and to verify land cover analysis results in 8 assessment points. Other data are indications of HCV presences within assessment area. To verify the accuracy of topographical conditions described in DEM secondary data, general observation was carried out throughout the landscape within HGU SAP.

Spatial analysis to create delineation of HCV 1-6 was accomplished through data analysis of ecosystem and biodiversity (HCV 1-3), ecosystem service (HCV 4), basic and cultural needs of local/traditional community (HCV 5-6).

2.2.3.4 Schedule

Table 10. Assessment Schedule

No.	Stage	Period
1	Scoping survey and obtaining assessment approval from indigenous community	3-7 April 2017
2	Stakeholder Consultation in <i>Kabupaten</i> /Regency level (Pre-Assessment Stakeholder Consultation)	8 June 2017
3	Full Survey (Ecosystem service and biodiversity Field survey)	6-22 June 2017
4	Full Survey (Social Field Survey)	30 May – 17 June 2017
5	Full Survey (Delineation Ground check HCV location and area management)	30 May – 22 June 2017
6	Full Survey (Social Follow-Up Survey at Old Kampung – Sima and Wanggar Pantai)	16-27 July 2017
7	Stakeholder Consultation in Village level (assessment result approval from local/traditional communities)	22 August 2017
8	Stakeholder Consultation in <i>Kabupaten</i> /Regency level (Post-Assessment Stakeholder Consultation)	30-31 August 2017

Table 11. Definitions of HCV Categories/Sub-Categories

	Definition	Criteria
HCV1.1	Areas that Contain or Provide Biodiversity Support Function to Protection or Conservation Areas	Conservation areas near or inside concession area (with significant biodiversity) Area that might provide biodiversity support function to protected or conservation areas near concession area Area where operational activities might negatively affected biodiversity conservation function of a protected or conservation area.
HCV1.2	Critically endangered species	Critically endangered species (or sub-species) based on IUCN Red List
HCV 1.3	Viable Populations of Endangered, Restricted Range or Protected Species	All CR, EN, VU species as listed on IUCN Red List Restricted range species (endemic species) present in one island or part of it Species protected by Indonesia Law (Law no 5/1990) and listed in PP no 7/1999 Species listed on CITES Appendix I and II
HCV 1.4	Habitat of Temporary Use by Species or Congregations of Species	Certain species that needs a specific habitat in their life cycle, where they congregate, stay, breed, migrate, etc is considered as keystone habitat
HCV 2.1	Large Natural Landscapes with Capacity to Maintain Natural Ecological Processes and Dynamics	Core Area >20,000 ha consists of unfragmented natural habitat
HCV 2.2	Areas that Contain Two or More Contiguous Ecosystems	Area should have two or more continuous representative ecosystem within landscape – with ecotone/ecoline
HCV 2.3	Areas that Contain Representative Populations of Most Naturally Occurring Species	Extensive area with surrogate biodiversity/landscape necessary to support such species.
HCV 3	Rare, threatened, or endangered ecosystems, habitats or refugia.	- Threatened Lose 50% or more of initial area of a biogeographical ecosystem unit. Will lose 75% or more of the initial area, based on the assumption that all HPK/APL area will be converted. - Rare: natural ecosystem that covers less than 1-5% of biogeographical area.
HCV 4.1	Areas or Ecosystems Important for the Provision of Water and Prevention of Floods for Downstream Communities	Forest in watershed area is in good condition and able to function in regulating water in downstream area. Forest in watershed is in good condition and able to function in regulating water in downstream area. If the area provide services to supply water or prevent flood. Forest ecosystem, such as cloud forest, montane ridge forest, riparian ecosystem, karst forest, wetland ecosystem including peatland, grassland, have a significant hydrological function

	Definition	Criteria
HCV 4.2	Areas Important for the Prevention of Erosion and Sedimentation	Forest area with steep slopes and Erosion Hazard Level (Tingkat Bahaya Erosi, TBE) >180 ton/ha/year, good forest cover to prevent erosion, landslide and watershed sedimentation.
HCV 4.3	Areas that Function as Natural Barriers to the Spread of Forest or Ground Fire	Natural forest with good condition is not prone to fire. For example, a peat forest with an intact hydrology system, swamp forest, wetlands, and other green lines consists of fireproof plants will be able to deter forest fire..
HCV 5	Sites and resources fundamental for satisfying the basic necessities of local communities or indigenous peoples (for example for livelihoods, health, nutrition, water), identified through engagement with these communities or indigenous peoples.	Sites or natural resources fundamental for satisfying substantial basic needs of local community, irreplaceable, and managed in traditional and/or sustainable manner by its user/owner/manager.
HCV 6	Sites, resources, habitats and landscapes of global or national cultural, archaeological or historical significance, and/or of critical cultural, ecological, economic or religious/sacred importance for the traditional cultures of local communities or indigenous peoples, identified through engagement with these local communities or indigenous peoples.	<p>Sites, resources, habitat and landscape with high cultural value, recognized by national policy and legislation</p> <p>Sites, resources, habitat and landscape established legally from national government and/or international institution such as UNESCO</p> <p>Sites, resources, habitat and landscape with recognized important historical and cultural value, even if not protected by legislation. Religious or sacred sites, resources, habitat and landscape (cemetery, or site for traditional rites, which is important to local community)</p> <p>Plants or animal with totemic value or used in traditional ceremonies.</p>

2.2.3.5. Stakeholder Consultation

Consultation with Key Stakeholders and interest groups was carried out through a variety of approaches before and during the assessment. Consultation with local communities and key traditional community figures was done during FGD and participatory surveys of HCV 5 and 6. HCV Assessment results at the village level were consulted with a broad group of village members (20 - 25 August 2017) to obtain agreement on the results themselves as well as management and monitoring HCVs – freely and without coercion so that the consequences of HCV identification and their management were fully understood. Inputs of the consultation have been incorporated in the final assessment report.

For wider stakeholder consultation, stakeholder consultation workshops were held prior to (8 June 2017) and after the assessment (30-31 Agustus 2017) and attended by government organisations, NGOs, traditional community organisations, faith based organisations, and private sector operating in the landscape. Community representatives, Village government, and District government were also in attendance during the post-assessment stakeholder consultations.

2.2.3.6. Quality Control

Since the first HCV assessments, the HCV Resource Network (HCVRN) has developed the Assessor Licensing Scheme (ALS) as a system to provide assurance of the competence of the professionals undertaking assessments. The ALS was launched on 31st October 2014 to promote more consistent implementation of the HCV approach by providing standardized rules, manuals and templates for completing assessments and by monitoring the performance assessors by evaluating the quality of their assessment reports. The HCVRN ALS thereby provides assurance to prevent failures in HCV assessments.

The HCV Assessment report was subject to the usual review processes to assess quality. The assessment report passed the HCVRN Quality Panel Review process with satisfactory status on the second round of evaluation, verifying that the HCV assessments have been completed in compliance with the rules of the HCVRN ALS and the guidance provided in the 'HCV Assessment Manual' and other relevant documents, tools and templates.

2.3 Land Use Change Analysis

2.3.1. Dates of Land Use Change Analysis and Assessor Credentials

Field assessment related to the LUC assessments was carried out between March and July 2017 by Ata-Marie.

Table 12. LUCA Team

Name	Qualification	Position
Alex Thorp	B. For. Sc.	Project Manager
George Kuru	M. For. Sc.	Inventory Data processing
Dadan Setiawan	S. Hut	Senior GIS Engineer
Dadi Ardiansyah	S. Hut	GIS Engineer and Field forester responsible for carbon inventory
Asep Wahyu Suherman	S. Hut	Participatory Land Use Mapping.
Dyah Ayu Putri Pertiwi	S. Hut	GIS Engineer
Krisma Lekitoi	S. Hut	Botanist

2.3.2. Land Use Change Analysis Methods

The methods used in the Land Use Change Analysis study of PT SAP include: a) Remote sensing and GIS Analysis; b) Review the secondary data reports and others secondary data utilized (HCV Report, AMDAL report, SIA Report, Soil Analysis report, Peat land Assessment Report); c) Definition of Land cover strata and vegetation coefficient; d) Field Verification; e) Image and Land Cover Stratification Validation; f) Change Detection Analysis.

Table 13. Land covers strata and vegetation coefficient

Land Cover Strata	Description	Vegetation Coefficient
Primary Forest	Forest undisturbed by any human activity including both selective logging (large and small scale) and clearance for gardening. Primary forests in NB/SAP are limited to wet swampy	1

Land Cover Strata	Description	Vegetation Coefficient
	areas unattractive for commercial logging.	
Secondary Forest	Forest disturbed by selective logging (large and small scale).	0.7
Agroforestry/ Mixed forest and rubber.	Mixed fruit trees, rubber and residual natural forest. This stratum is not found in the study area.	0.4
Agriculture	Agricultural activities. In the study area this is limited to small areas of active smallholder shifting cultivation.	0
Scrub	Land reverting to forest after historical non-corporate land clearing. Simple low canopy and dominated by pioneer species.	0
Scrub (reverting LC)	Land fully or partially cleared by the company but not planted, and now reverting to scrub. Simple low canopy and dominated by pioneer species.	0
Land Clearing in Progress	Land undergoing active clearance by the developer in preparation for establishment of oil palm and related infrastructure. This land cover class is a temporary condition.	0
Oil Palm	Established oil palm areas.	0
Infrastructure & Amenities	Developer's facilities on site: offices, accommodation, workshops, warehouses, nurseries etc. Also includes access roads outside	0
Bare Land	Open land.	0
Water Body	Large rivers and other open water bodies.	0

Table 14. Field Verification Framework

Validating the land cover data	Validation of the land cover was done primarily in conjunction with the HCS inventory. A total of 187 HCS plots were measured. In addition, forest inspection was carried out during participatory mapping of land use and a sago inventory focusing on the Sima Dusun Sago area.
Compiling information related to historical land cover and land use in the study area.	Document Review. Review of a range of documents including company documents related to project development and environmental management. Review of third party data on forest and ecology in the region. Participatory Mapping. Discussions, interviews and field inspections to sites relevant to past and current land use.
Identifying the loss of social HCVs.	Identification of the loss of social HCV's (HCV 4, 5, and 6) was carried out via discussions, interviews and field inspections with relevant Stakeholders, in particular Wanggar and Sima community members.
Identifying the loss of areas	Spatial analysis. Overlay data from interpretation of satellite imagery with river

where planting is prohibited by RSPO P&C or by country's specific legislation (e.g. riparian zones, steep slope, deep peat).	buffers, slope maps, and soil types. Ground check survey. Field survey to verify findings of initial spatial analysis.
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2.4. Carbon Stock Assessment and Estimation of GHG Emissions

2.4.1. Dates of Assessment and Assessor Credentials

Table 15. Assessment team for GHG Assessment and Carbon Stock Assessment

Name	Qualification	Position
Alex Thorp	B. For. Sc.	Project Manager
George Kuru	M. For. Sc.	Inventory Data processing
Dadan Setiawan	S. Hut	Senior GIS Engineer
Dadi Ardiansyah	S. Hut	GIS Engineer and Field forester responsible for carbon inventory
Asep Wahyu Suherman	S. Hut	Participatory Land Use Mapping.
Dyah Ayu Putri Pertiwi	S. Hut	GIS Engineer
Krisma Lekitoi	S. Hut	Botanist

2.4.2. GHG Assessment and Carbon Stock Assessment Methods

GHG Assessment report was conducted according to RSPO GHG Assessment Procedure for New Development version 3, October 2016 and incorporated carbon stock assessment based on the The HCS Approach Toolkit Version 2.0: Putting No Deforestation into Practice, 3 May 2017. The assessment followed the process of HCS Forest Patch Analysis Decision Tree described in the 2017 toolkit. The carbon stock map serves as a guide to estimate projected emission from land use change and development.

Inventory Plots

Each plot consists of two concentric circular plots with areas of 0.05 and 0.01 hectares respectively. **Figure 6** shows the layout of a single HCS plot. Small diameter trees (<15cm DBH) are measured only in the sub plot. Trees with DBH ≥15cm are measured throughout the whole plot.

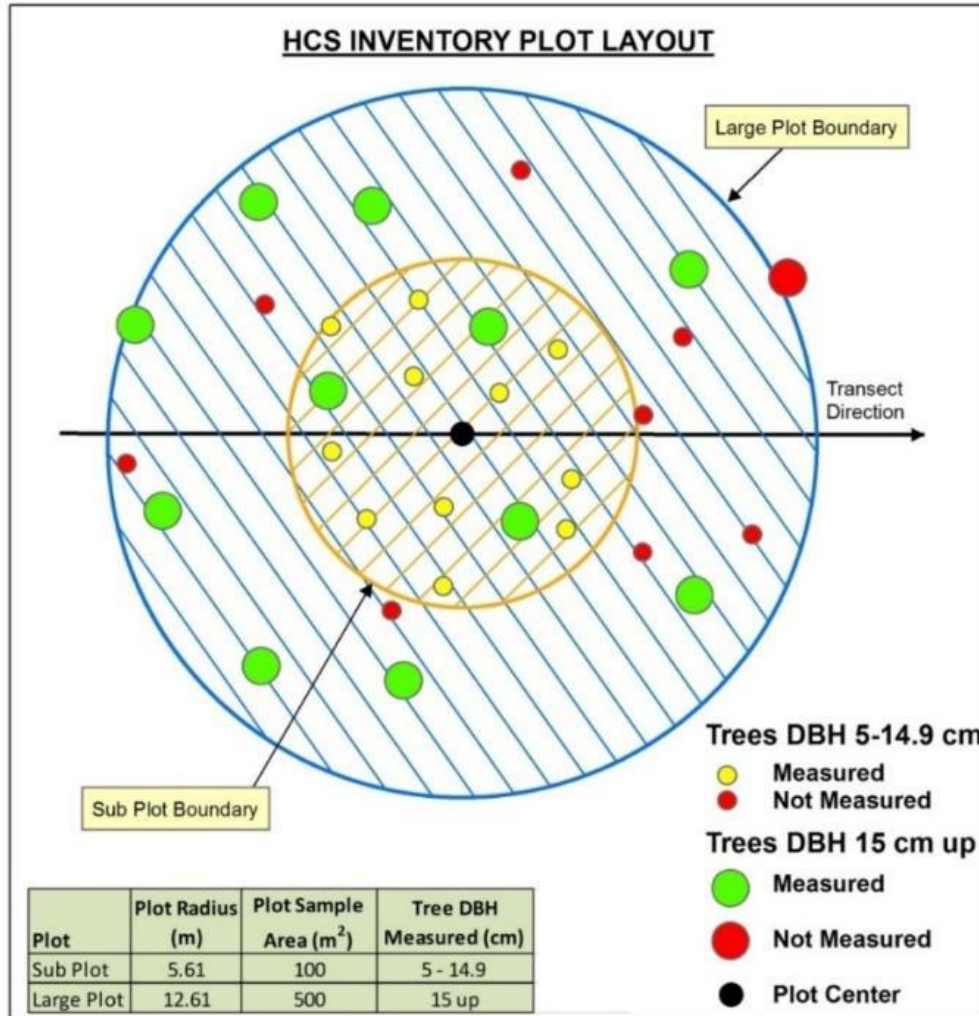


Figure 6. HCS Inventory Plot Layout

For each inventory plot measured, the following information is collected:

- GPS waypoint
- Plot photographs (set of 5)
- Land cover strata (as assessed by team leader)
- Canopy cover code
- Description of plot site and general surroundings
- Description of topography, soil and underfoot conditions
- Description of any evidence of human activity

For each tree measured, the following data is collected:

- Species
- Diameter
- Total tree height

Carbon Calculation

Standard methods for carbon calculation are used to estimate total biomass and carbon mass per plot, strata averages of total biomass and carbon mass per ha, as well as strata averages distributed by diameter class.

Stems per hectare is calculated from the plot size. The equation used is:

$$\text{Stems per hectare} = (\text{Count of trees in the plot}) / (\text{Plot size in hectares})$$

Tree biomass was estimated for the living trees with DBH larger or equal to 5 cm using the Allometric Equations method. The following equation for wet tropical forests (Chave, et. al. 2005) was applied. This widely used equation relates DBH, total tree height and species-specific wood density (ρ) to estimate Above Ground Live Biomass (AGLB) per tree measured in the forest plots. The resulting AGLB is the total biomass of the stem, crown, and leaves for trees in kilograms.

$$\text{AGLBi} = 0.0776[\rho_i D^2 i H_i]^{0.940}$$

Where: AGLB = Above ground live biomass in kilograms
 D = Diameter at breast height (1.3m above ground) in centimetres
 H = Total tree height in metres
 ρ = Specific gravity in grams per cubic centimetre

Palm Biomass

The equation used for estimating palm biomass was:

$$\text{Palm Biomass}^1 \text{ (tonne)} = [\text{Specific gravity}] * D^2 / 40000 * (\text{palm height})$$

For palms, specific gravity is assumed to be 0.247 tonne per green m³.

Tree and Palm Carbon Content

The C fraction of biomass is calculated in tonnes of C (Mg C). The equation used for estimating Tree and Palm Carbon Content was:

$$\text{Carbon Mass (tonne)} = \text{Biomass} * (\text{Carbon conversion factor})$$

The carbon conversion factor estimates the carbon component of the vegetation biomass. This can be derived for specific forest types or the IPCC standard value of 0.47 can be used. In this case the IPCC standard value has been used.

Carbon Mass per Hectare

The equation for estimating tree carbon mass per hectare in each plot is:

$$\text{Total Carbon (tonne/ha)} = \Sigma ([\text{Tree Carbon}]) / [\text{Plot size in hectares}]$$

¹ The palm equation uses the geometric equation for a cylinder multiplied by the specific gravity. No specific equations are available in the scientific literature and so this simple equation has been used.

Separate calculations of volume are made for estimating tree volume in sub-plots because the plot size differs between the main and subplot.

Analysis of Carbon Estimate Precision and Significant Difference between Strata

Carbon Estimate Precision

The target precision level for carbon stock estimates is 90% confidence intervals within 10% of the average total carbon stock per ha in each strata for the designated above ground carbon pools. 90% confidence intervals (CI) were calculated for each land cover strata from the calculated carbon per ha in each plot using the following standard formula:

$$CI = t_{\alpha/2} \cdot s/\sqrt{n}$$

Where: t is the Student's t value,
 α determines the level of confidence
 s is the standard deviation of the sample and n is the sample size.

Table 16. GHG Emission Source and Sequestration

Source			Remarks
Emission Source	1	Land Conversion	CO ₂ emissions from land conversion
	2	Fertilizing	N ₂ O and CO ₂ emissions from the use of mineral fertilizers and organic materials in the field and their transportation
	3	Fuel Consumption	Emissions from the use of fuel
	4	Peat Oxidation	N ₂ O and CO ₂ emissions resulting from cultivation on peat soil
Sequestration Source	5	Oil Palm Sequestration	Absorption of oil palm (crop sequestration). Absorption of carbon dioxide (CO ₂) remains by oil palm trees, ground cover and carbon sequestration in plantation litter.
	6	Conservation area Sequestration	Absorption (CO ₂) in conservation areas. Carbon dioxide is determined by the amount of biomass in the conservation area.

Notes: The Source of the emission below is not calculated, because when the GHG calculation conducted, NB and SAP not yet developed Palm Oil Mill. (Fuel of Palm Oil Mill; CH₄ from POME; and Credit Emission for excess Energy transferred)

2.5. Soil and Topography Assessment

2.5.1. Dates of Soil and Topography Assessment and Assessor Credentials

This semi-detailed soil survey and soil management groups and sub-groups assessment for oil palm plantation was carried out by Carmiel Agrotech Sdn. Bhd. in collaboration with Param Agricultural Soil Survey (M) Sdn. Bhd in March 2017. A second survey was carried out by Ekologika and Ata Marie as part of HCV Assessment.

2.5.2. Soil and Topography Assessment Methods

The survey as part of HCV assessment used the methods of purposive sampling methods, where the sampling unit take based on "Assessment" Location that indicative as peat refer to secondary

data/document: Land system Map; Soil map of PT NB and PT SAP; Land Cover Map; and Digital Elevation Map.

Sampling: 1 per 250m (5 samples along 1000m)



Figure 7. Soil Sampling

2.6. Community Engagement and FPIC

Free Prior and Informed Consent (PADIATAPA / FPIC) is the right of the right holders of land to grant or deny their consent to any activities / projects that have the potential to impact on their land, livelihoods and environment. The FPIC Principles have been set out in the UN Declaration on the rights of indigenous peoples as well as the national constitution, and have also been regulated in the context of specific uses for the benefit of oil palm plantations, using the RSPO standard.

Goodhope appointed a third party consultant, LINKS to review the implementation of FPIC processes. The integrated assessment considered compliance against both RSPO FPIC Guidelines (2008) and IFC's Performance Standards related to FPIC, in particular the following five processes:

1. Community participation through the involvement of community representatives (stakeholder engagement).
2. Delivery of information to the community concerned the existence and operation of Goodhope plantations in the Nabire area.
3. Negotiation and land acquisition processes.
4. Implementation of adequate social and environmental impact assessments, including sufficient transfer of knowledge to local communities.
5. Procedures for resolving complaints and conflicts.

The analysis included field visit and comprised document review, in-depth interviews, and participatory focus group discussions to assess compliance with FPIC processes and to develop recommendations for improvement.

In 2017 Ata Marie and Ekologika continued the process of community engagement and participatory mapping to seek community informed consent to the final draft boundaries of conservation areas. FGDs were held at each village between 20-25 August between the HCV/HCS teams and Communities. The objective was to present and discuss the findings of the HCV, HCS, and participatory mapping surveys carried out during the initial site visit. Large scale maps of the draft land use plan were displayed, and Community members invited to check and add comments as desired during the discussions. Additional inputs were also received during the two-day final stakeholder consultation meeting held on 30-31 August in Nabire.

Table 17. Description of Community Engagement Activities

	Activities	Material / Data
1 st	Meeting with (1) Desa leader - formal (Kepala Desa/Kampung), (2) cultural leader – non-formal (Kepala Suku, Ondoafi, etc.)	Introduction and explanation on team scope of work. Description on survey's activities (HCS and HCV) Consent on survey activities from Desa leader/adat leader and/or community; in the name of community. Information on technical support needed from community leaders and local community.
2 nd	FGD-1	Confirmation of village history. Sketch of Desa and community land use system. Community land tenure system identification, land management and land owner identification (owners, managers, users).
3 rd	Ground check-1: Participatory Mapping – Community Land Use System	GPS survey – capture of area (polygon/point) taking and land use types and variation. Community representative acknowledged the interest area's border.
4 th	FGD-2	Confirmation of results of Participatory Mapping (tentative map). Stakeholder analysis and social mapping (wealth ranking) – including confirmation of sub suku and clan boundaries. Identification of resources/objects/sites is important for community basic needs (livelihood) and culture – HCV 5 dan HCV 6. ecology history - recording (1) on sudden or gradual major changes to livelihood due to company operational activities, and other economy entity; (2) access, control, and availability status of HCV 5 and 6 (picture on existence/availability and tendency).
5 th	FGD-3 (FGD FPIC)	Delineation of KBKT HCV 5 and 6, HCV threats identification.

Table 18. Community Engagement Activity Schedule

Stage	Activities	Survey Team	Timeline
Scoping Visit	Scoping survey on biodiversity and social aspects; local community agreement	HCS Assessment Team (Ata-Marie)	3-7 April 2017
1 st Stakeholder Consultation Workshop (in Pre-Survei Stages)	Stakeholder consultation on the results of the environmental survey, information gap, HCV Potential, and HCV Assessment Methodology	All Assessor Team	8 June 2017
Sima Village Social Survey	Meeting with the head of Sima village for authorization to conduct activities	Social Survey Team	1 June 2017
	Meeting with the head of Sima village for coordination of GD1	Social Survey Team	8 June 2017
	FGD 1 Sima village on Community land use and tenure study	Social Survey Team	9 June 2017
	<i>Ground check</i> 1 Sima village: Rujahi, Ruija, Kolam Ubamamoi, Goa Nenggomana dan Goa Nenggoina	Social Survey Team	10 June 2017
	Sima village interviews: fishermen	Social Survey Team	11 June 2017
	Sima village interviews: women	Social Survey Team	12 June 2017
	Sima village interviews: Tokoh masyarakat Kampung Sima	Social Survey Team	13 June 2017
	Interviews CSR and HUMAS Managers	Social Survey Team	13 June 2017
	Sima village interviews: Warga dan Sekretaris Kepala Suku	Social Survey Team	14 June 2017
	Sima village community interviews	Social Survey Team	15 June 2017
	FGD ethnographic study	Social Survey Team	16 June 2017
	FGD 2 Sima village on the identification of HCV 5, 6 and planning for ground checks	Social Survey Team	19 July 2017
	<i>Ground check</i> 2 Sima village: Sago and fishing locations	Social Survey Team	23 July 2017
	FGD 3 Sima village: Presentation of the results of ground checks in sago groves and fishing locations, and grievance mapping	Social Survey Team	25 July 2017
<i>Ground check</i> Dusun Sagu	Social Survey Team	26 July 2017	
Kampung Wanggar Pantai Social Survey	Meeting with the head of Wanggar Pantai village for authorization of survey activities	Social Survey Team	1 June 2017
	FGD 1 Wanggar Pantai village on community land-use and tenure studies	Social Survey Team	2 June 2017
	<i>Ground check</i> 1 Wanggar Pantai village: Dusun sagu, sungai dan	Social Survey Team	3 June 2017

Stage	Activities	Survey Team	Timeline
	rawa dan tataguna lahan		
	FGD 2 Wanggar Pantai village: Social mapping / stakeholder analysis and Ground Check Confirmation	Social Survey Team	4 June 2017
	FGD 3 Wanggar Pantai village: Participatory mapping, Ecological history, Identification of HCVs 5 and 6	Social Survey Team	5 Juni 2017
	<i>Ground check</i> 2 Wanggar Pantai village for identification of HCVs 5 and 6	Social Survey Team	6 June 2017
	FGD 4 Wanggar Pantai village	Social Survey Team	7 June 2017
	Interviews Wanggar Pantai village: livelihoods, HCV 5 and grievance mapping	Social Survey Team	20 July 2017
	<i>Ground check</i> 3 Wanggar Pantai village	Social Survey Team	23 July 2017
Wami Social Survey	Meeting with head of Wami village or authorization of survey activities	Social Survey Team	1 June 2017
	FGD 1 Wami village: Pemetaan sejarah kampung, Sketsa kampung/desa dan Sistem Tata guna lahan masyarakat, Analisis Pemangku Kepentingan, Peta sosial (wealth ranking)	Social Survey Team	3 June 17
	FGD 2 Wami village: Identification of HCV 5 and 6	Social Survey Team	10 June 2017
	<i>Ground check</i> Wami village	Social Survey Team	14 June 2017
Jaya Mukti Social Survey	Meeting with head of Jaya Mukti village for authorization of survey activities	Social Survey Team	1 June 2017
	FGD 1 Jaya Mukti village: Pemetaan sejarah kampung, Sketsa kampung/desa dan Sistem Tata guna lahan masyarakat, Analisis Pemangku Kepentingan, Peta sosial (wealth ranking)	Social Survey Team	7 June 2017
	FGD 2 Kampung Jaya Mukti: Identification of HCV 5 and 6	Social Survey Team	12 June 2017
	<i>Ground check</i> Jaya Mukti village	Social Survey Team	13 June 2017
	<i>Ground check</i> Jaya Mukti village	Social Survey Team	15 June 2017
Yaro Makmur Social Survey	Meeting with head of Yaro Makmuri village for authorization of survey activities	Social Survey Team	1 June 2017
	FGD 1 Yaro Makmur village: Pemetaan sejarah kampung, Sketsa kampung/desa dan Sistem Tata guna lahan masyarakat, Analisis	Social Survey Team	3 June 2017

Stage	Activities	Survey Team	Timeline
	Pemangku Kepentingan, Peta sosial (wealth ranking)		
	FGD 2 Yaro Makmur village on the Identification of HCVs 5 and 6	Social Survey Team	6 June 2017
	<i>Ground check</i> Yaro Makmur village	Social Survey Team	12 June 17
Ecological Survey	Observations of species, interviews	Ecology and HCS Assessor Team	1-21 June 2017
Environmental Services Survey	Observations on rivers, hills and forest cover	Ecosystem Services Team	9-21 June 2017
Villages Public Consultation	Penetapan Identifikasi NKT 5 dan NKT 6, Penyampaian Identifikasi NKT 1-4, ancaman NKT, dan rekomendasi pengelolaan NKT 1-6 – FPIC pengelolaan NKT	Team-1: Sima	22 June 2017
		Team-2: Wami	22 August 2017
		Team-2: Yaro Makmur	23 August 2017
		Team-1: Wanggar Pantai	23 August 2017
		Team-2: Jaya Mukti	24 August 2017
Consultation with Management Unit NB and SAP	Consultation on HCV Identification 1-6, HCV threats, and HCV management recommendations	All Assessor Team	28 August 2017
2 nd Stakeholder Consultation Workshop Post Survey (Result of HCV Assessment)	Stakeholder consultation on HCV Identification 1-6, HCV threats and HCV management recommendations (Plenary and Group Discussion)	All Assessor Team	30-31 August 2017

3. SUMMARY OF FINDINGS

3.1. SEIA Findings and Results

3.1.1 Outputs

Outputs from the assessment are:

- Identification of operational activities that provide potential impacts / impacts
- Potential indications of impacts (both positive and negative) on socio-economic aspects of regional / sub-national and national scale
- Identification of potential positive impacts / impacts direct and indirect to the local community (including indigenous peoples)
- Identification of potential direct and indirect negative impacts / impacts on local communities (including indigenous peoples)
- Identification of potential positive and negative impacts / impacts (both direct and indirect) with regard to emergent communities (workers, suppliers, etc.)
- Identification of social issues that have the potential to become social risks
- Recommendations for managing positive social impacts and mitigating negative social impacts
- Recommendations for monitoring positive / negative social impacts
- List of legal documents, permits based on applicable regulations and ownership deeds relating to the area assessed
- Document including interview and meeting notes (FGD)
- Other evidence that the assessment has been carried out with the participation of affected parties including representatives of women's groups, youth, and vulnerable and minority groups
- Stakeholder consultation with affected stakeholders and stakeholders other interests (authority and interest stakeholders)
- Data Documentation and Social Impact Assessment Tool (can be reviewed and updated).

3.1.2 Potential Changes in General Condition

i. Changes in human capital

Changes in human capital have occurred and can occur in the health, education and employment sectors of the affected population. In the health sector, there are potential health problems due to several plantation business activities such as mobilization of operational vehicles, diseases caused by mosquito vectors and also health problems due to climate change in the surrounding area. Poor management of environmental impacts can affect the quality of public health. This creates high vulnerability to the community if it is not mitigated and addressed, both by the community and the plantation management unit. With the existence of plasma products, it is also expected that the community can access better health services. But on the other hand changes in the pattern of consumption of the community after receiving plasma products can also influence the emergence of types of diseases that can disrupt public health.

Changes in the education sector have begun to appear with an increase in the quality of the education process, especially basic education with the help of teacher support, scholarship assistance and others from the plantation management unit. Another change that can occur is an increase in the number of

people who can access higher education facilities in the presence of plasma. But the excessive consumption pattern of plasma products can also influence the desire to go to school, especially if it is not supported by good parenting from the parents and the environment.

The work skills of the affected communities especially those involved in the business process of oil palm plantations as workers can increase with the training and guidance efforts of the management unit. But on the other hand, dependence on plasma products can also reduce people's interest in working.

ii. Changes to natural capital

Changes to natural capital that have or have the potential to occur as a result of plantation business processes include indicators such as the quality of water sources, availability of local food, household fuel and also the availability of game animals. Community water sources which generally still depend on the availability of drinking water from the surrounding environment, especially community wells, can be disrupted both in quantity and quality. Reduced discharge and quality of community water can cause health problems and can also result in increased public expenditure if you have to buy water from traveling vendors.

The culture of the people who still produce their own food they consume can change with PT Sariwana Adi Perkasa's oil palm plantation activities both directly and indirectly. Decreased land for farming and destruction of river / sea ecosystems, as well as reduced community hunting areas are examples of potential impacts that can cause disruption of local food availability.

Another change in natural capital that can occur is the pattern of household fuel use. People who generally still use fuel wood for cooking needs can find it difficult to get firewood or are forced to switch to other fuels such as kerosene stoves, which have implications for additional household costs and potential scarcity of kerosene availability.

The above changes (especially those that require costs) if they are not balanced with an increase in household income, for example from plasma yields can lead to new conditions of poverty.

iii. Changes to physical capital / infrastructure

Changes in infrastructure capital (physical) as a social impact of plantation activities include the ease of mobility with the opening of new plantation roads and other supporting infrastructure. Another change that can occur is the potential for increased community motor vehicle ownership both motorbikes and cars. The perception of the public who will get a relatively large share of plasma profits can encourage consumption patterns, including for purchasing vehicles.

In addition, improving the welfare of the community (KPMA members) who obtain plasma products encourages the fulfillment of other infrastructure needs such as electricity connections and telecommunications access. The high demand for these two infrastructures can encourage the investment of provider companies and can also increase the use of household appliances that require electricity connections and communication devices (cellular phones).

iv. Changes to Financial capital

Changes in financial capital can be in the form of changes in the main source of income for the community, especially KPMA members who get plasma profit sharing every month. The relatively large income from plasma can indirectly lead to changes in the consumption pattern of the community, which can stimulate other economic activities such as trading activities in the market and also local shops.

Community perceptions (KPMA members) about the relatively large distribution of plasma products are considered to be able to meet community needs and do not require other jobs (sources of income). This can lead to the public's potential for laziness to work again. If there is a discrepancy between the perception of the community (which is based on the management unit's promise of the results of the plasma that has been socialized) with the reality when the distribution of plasma products can lead to the potential for prolonged conflict with the plantation.

v. Changes to Social capital

Changes in social capital as a result of the business process of oil palm plantations include the potential for higher conflicts, as well as affecting the social cohesiveness of the community. Conflicts that can occur can be between communities, or between communities and plantation management units. Horizontal conflicts between communities can be caused by, for example, the management of KPMA that is not transparent and accountable, there is mutual distrust between the people who are pro and contra with the company and also between workers and non-workers.

Changes in other social capital are also influenced by changes in the demographics of the local population. The large number of labor of plantation companies brought in from outside can lead to a variety of customs and cultures and also the potential for cultural acculturation. In addition, changes in the demographic structure of the population can also influence local cultural practices that are still centered on tribal leaders.

3.1.3 Positive Impacts

The good change that has been felt by the community so far is the existence of assistance from PT Sariwana Adi Perkasa to customary institutions as well as religious facilities, especially churches in the local area.

Positive impacts that must be managed by the management unit are as follows:

- Potential additional household income from the distribution of plasma yields
- Potential additional household income by engaging as a plantation service provider / contractor
- Potential additional household income by engaging as plantation employees
- Potential additional household income from leasing land to immigrants
- Potential increase in economic activities of the community
- Increased public access road
- Increased public knowledge about agriculture and plantation cultivation
- Increased knowledge and ability of cooperative management

3.1.4 Negative Impacts

From interviews and discussions with specific group of communities, several issues have been raised. Based on the results of the analysis of community vulnerability to business processes / company presence, the negative impacts that must be a priority (important impact) of the management unit to be managed are negative impacts which are high risk to the community; as follows:

- Potential reduced access to production from customary lands such as sago, hunting, timber, rattan, etc. due to land clearing

- Potential for conflict due to differences in the value of compensation received by each community member / KPMA.
- Increasing the number of people suffering from mosquito-borne diseases as disease vectors due to land clearing
- Source of clean water decreases due to land clearing
- Potential loss of nutrient sources due to reduced hunting location
- Potential loss of types of local food sources due to land clearing activities
- 7 Reduced community sago inventory due to land clearing errors
- Potential conflicts between KPMA management and members and between KPMA (community) members and companies due to limited understanding of KPMA members on business processes, including operational costs that are borne by cooperatives and plasma profit sharing.
- KPMA management does not work well
- Potential for river water pollution that can reduce river water quality and disruption of aquatic life due to the use of fertilizers and pesticides in the nursery process
- Potential landslides due to land erosion in the process of planting oil palm in hilly areas
- 12 Potential decline in productivity of oil palm plants due to massive pest attacks due to planting of homogeneous (oil palm) plant species
- Potential emergence of health problems due to increased dust content due to mobilization of plantation operational vehicles during planting process
- Potential disruption of community mobility due to road damage due to mobilization plantation operational vehicles during the planting process
- Potential for river water pollution which can reduce river water quality and disruption of aquatic life due to the use of fertilizers and pesticides in the maintenance process.
- Potential reduction in water discharge that can disrupt community water supply due to water use in the maintenance process
- Potential health problems during maintenance activities due to the use of chemical fertilizers and maintenance pesticides
- Potential health problems due to increased dust content due to mobilization of plantation operational vehicles in the maintenance process
- Potential disruption of community mobility due to road damage due to mobilization of plantation operational vehicles in the maintenance process
- Potential conflicts between indigenous people and migrant workers arise during the maintenance process.
- Potential occurrence of health problems due to increased dust and noise due to mobilization of plantation operational vehicles in the harvesting process
- Potential disruption of community mobility due to road damage due to mobilization of plantation operational vehicles in the harvesting process
- Potential conflicts between indigenous communities and migrant workers in the process construction of palm oil mills
- Potential health problems due to increased dust and noise due to mobilization of plantation operational vehicles in the process of building palm oil mills
- Potential disruption of community mobility due to road damage due to mobilization of plantation operational vehicles in the process of building palm oil mills
- Potential the emergence of health problems due to air pollution and noise because of the palm oil mill machinery activities in the palm oil processing
- Potential emergence of health problems due to pollution disturbance from oil palm machinery activities in palm oil processing

- Potential health problems due to increased dust and noise content due to plantation operational vehicle mobilization in oil palm processing
- Potential disruption of community mobility due to road damage due to mobilization of plantation operational vehicles in the processing oil palm
- Potential potential conflicts between indigenous people and migrant workers in the oil palm processing process
- Potential reduction in income of KPMA members due to reduced plasma area due to reduction in areas that support HCV and HCS
- Reduced potential for food sources due to legal sanctions for illegal activities for hunting protected species

3.1.5 Development Priorities

1. Improving the quality of basic services

The quality of affected communities, especially the education and health sectors, is the main priority of development. The health and education sector and other basic services are sectors that are included in the obligatory government affairs which are the responsibility of the regional government. Improving the quality of basic services that target the strengthening of human capital is expected to be the capital of the community to get alternative choices to improve the quality of life of the community and also alleviate poverty.

2. Strengthening Basic Infrastructure

Strengthening basic infrastructure is needed as a support system for the livelihoods of affected people. Strengthening road infrastructure, telecommunications and electricity connections is expected to increase access and mobility of people to livelihood choices.

3. Food Security

Changes in the pattern of people's livelihoods from consuming food products produced by themselves into food obtained from outside (by buying) have the potential for food insecurity, especially if not supported by good purchasing power. Maintaining and increasing local food production can help people's food security.

4. Strengthening village government administrative services

Strengthening village administration services through strengthening the capacity of village officials and better administrative systems is expected to increase community cohesiveness. In addition, strengthening data collection and compiling village profiles can be the baseline for regional development in villages affected by PT Sariwana Adi Perkasa's business processes.

5. Management of Disaster Risk

The high risk of disasters in the villages affected by the PT Sariwana Adi Perkasa's business process requires a risk management plan as well as disaster preparedness. The long history of disaster events, especially the types of floods, coastal abrasion and earthquakes must be a priority for disaster risk management and preparedness. The creation of a flood early warning system and also a village evacuation plan as well as strengthening the ability to handle emergencies by local communities are priorities for disaster preparedness.

6. Law enforcement

The high potential for conflict that can occur as a result of several activities in the PT Sariwana Adi Perkasa's business process requires the handling of clever conflict resolution. Settlement of conflicts with law enforcement, both customary law and formal law must be put forward. Apart from that, the high threat of security from other parties also still needs security support without any attempt to intimidate the public.

7. Multi-stakeholder collaboration in landscape management

The large size of the landscape and the variety of actors involved in the business process of oil palm plantations require multi-stakeholder coordination and cooperation to support the interests of each party and also to reduce the potential for wider impacts including conflicts between parties.

8. Strengthening cultural, traditional and religious practices

Cultural practices, customs and religious activities can support the strengthening of the cohesiveness of affected communities. Strengthening cultural and customary practices based on existing tribal structures has a very important influence on PT Sariwana Adi Perkasa's business continuity. The company's partnership with customary rights holders based on a communal management system (based on tribes and sub-tribes) needs to ensure the existence of existing cultural and customary practices. In addition, cultural, customary and religious practices can be a media for resolving conflicts between customary rights owners and plantation managers.

9. Fostering community organizations

Community organizations as social capital of the affected villages generally do not have a significant role in supporting community livelihoods. The complexity and dynamism of problems in the community and the focus of community development on traditional and religious institutions need to be supported by other community organizations that focus more on each issue, such as community business organizations (cooperatives), women's organizations, youth organizations, and so on.

3.2. Land Use Change Analysis Findings and Results

The Land use change analysis (LUCA) study included: a) Remote sensing and GIS Analysis; b) Review the secondary data reports and others secondary data utilized (HCV Report, AMDAL report, SIA Report, Soil Analysis report, Peat land Assessment Report); c) Definition of Land cover strata and vegetation coefficient; d) Field Verification; e) Image and Land Cover Stratification Validation; f) Change Detection Analysis.

Validation of the land cover was done primarily in conjunction with the HCS inventory. A total of 187 HCS plots were measured. In addition, forest inspection was carried out during participatory mapping of land use and a sago inventory focusing on the Sima Dusun Sago area.

Information related to historical land cover and land use in the study area was compiled by:

- i. Review of a range of documents including company documents related to project development and environmental management.
- ii. Review of third party data on forest and ecology in the region.

- iii. Participatory Mapping, discussions, interviews and field inspections to sites relevant to past and current land use.

LANDSAT 8 imagery was used to determine changes of vegetation since November 2005 and combine with SPOT 6/7 imagery for 2016 data. Spatial analysis from satellite imagery overlaid with river buffers, slope maps, and soil types was verified by ground surveys on the field to check the findings of initial spatial analysis.

Additional LUCA was conducted for period of October 2017 to October 2019 to see land cover gap between the end of main LUCA Assessment NPP (Oct 2017) and current proposed NPP process (Oct 2019). This additional analyze also conducted by Ata Marie to prevent ambiguity in data processing.

Table 19. Satellite imagery utilised for each time of clearance period

	Period	Acquisition Date	Description of Satellite Images Used	Resolution	Cloud cover
1	Pre - Nov 1, 2005	June 2005	Landsat ETM+ 7Path/Row 104/62	30 m	0
2	Nov 1, 2005 - Nov 31, 2007	Nov 2007	Landsat TM 5, ETM+ 7 Path/Row 104/62	30 m	0
3	Dec 1, 2007 - Dec 31, 2009	April 2009	Landsat TM 5 Path/Row 104/62	30 m	0
4	Jan 1 2010 - Feb 28, 2011	Feb 2011	Landsat ETM+ 7 Path/Row 104/62	30 m	0
5	Mar 1, 2010 - May 8, 2013	May 2013	Landsat 8 OLI TIRS, Path/Row 104/62	30 m	0
6	May 2013 to May 9, 2014	August 2014	Landsat 8 OLI TIRS, Path/Row 104/62	30 m	15%
7	May 9, 2014 - Dec 2014	Dec 2014	Landsat 8 OLI TIRS, Path/Row 104/62	30 m	0
8	Dec 2014 – Nov 2016	April 2016 June, Oct & Dec 2016	SPOT6/7 Landsat 8 OLI TIRS, Path/Row 104/62 (Main/supporting)	2.5m 30 m	0
9	Nov 2016 – Mar 2017	March 2017	Landsat 8 OLI TIRS, Path/Row 104/62	30 m	0
10	Mar 2017 – Okt 2017	Sept 2017	Landsat 8 OLI TIRS, Path/Row 104/62	30 m	14%
11	Okt 2017 – Okt 2019	Sept 2019	Landsat 8 OLI TIRS, Path/Row 104/62	30 m	3%

Table 20. Land Cover at Each Measurement Date 2005-2019

Land Cover Class	Nov-05	Oct-07	Dec-09	Feb-11	May-13	May-14	Dec-14	Nov-16	Mar-17	Oct-17	Oct-19
Primary Forest	0	0	0	0	0	0	0	0	0	0	0
Secondary Forest	6,107	6,107	6,105	6,105	5,883	5,881	5,441	4,575	4,487	4,575	4,487
Agriculture	0	0	0	0	0	0	0	0	0	0	0
Scrub	316	316	316	316	234	290	280	186	186	186	186
Scrub (Reverting LC)	0	0	0	0	0	230	92	1,016	1,007	1,016	1,007
Bare Land	14	14	16	16	70	14	14	14	60	14	60
LCIP	0	0	0	0	251	22	374	43	95	43	95
Oil Palm	0	0	0	0	0	0	237	566	566	566	566
Infrastructure & Amenities	0	0	0	0	0	0	0	37	37	37	37
Water Body	0	0	0	0	0	0	0	0	0	0	0
Total	6,437	6,437	6,437	6,437	6,437	6,437	6,437	6,437	6,437	6,437	6,437

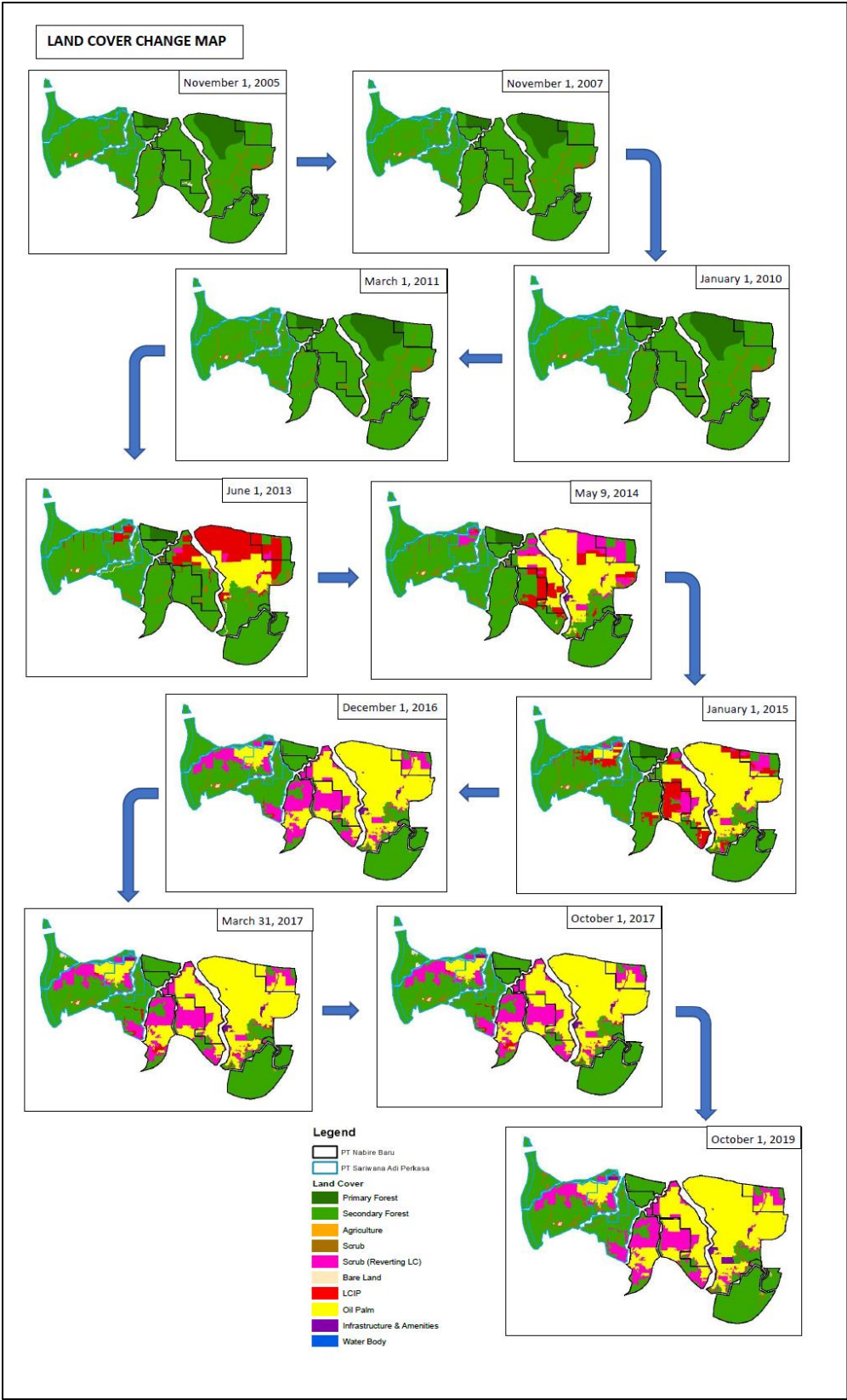


Figure 8. Process of Land cover Maps

3.3. HCV Assessment Findings

3.3.1 National and/or Regional Context

The landscape is part of the Papua Bird's-Head and Aru Islands Lowland Forest that stretches from Papua Bird's-Head to the east and south to Aru Islands. In general, compared to other ecoregion in Indo-Malay area, this ecoregion has low-medium level of biodiversity and endemism. However, reptile and amphibian diversity, although currently unknown, are probably important.

Forty-seven mammal species can be found in the ecoregion, including 8 endemic species. Mammals in this area classified as Australian marsupials, including critically endangered Tree kangaroo (*Dendrolagus sp.*) and Echidna (*Zaglossus bruijni*), as well as vulnerable Wallaby (*Thylogale bruijni*) and New Guinea Quoll (*Dasyurus albopunctatus*). This ecoregion boasts 366 bird species; most of them are Australasian family, such as Ptilonorhynchidae, Eopsaltridae, Meliphagidae, and Paradisaeidae. In 2000, approximately 90% of this ecoregion was considered as undisturbed natural ecosystem. However, in the last 17 years, the percentage of primary/natural ecosystem has decreased drastically. Conservation area covered 5,410 km² (7%) of ecoregion. Wide scale threats in regional context included illegal logging, infrastructure development and large-scale plantations.



Figure 9. WWF Ecoregion. Areas of similar species, most were based on plant diversity and dominant habitat (sumber: www.wwf.org)

Based on national landuse regulation, HCV assessment landscape consists of Permanent Production Forest (*Hutan Produksi Tetap*, HP), Protected Forest (*Hutan Lindung*, HL), Non-Forest (*Area Penggunaan Lain*, APL), Limited Production Forest (*Hutan Produksi Terbatas*, HPT), Convertible Production Forest (*Hutan Produksi Konversi*, HPK), and Marine Nature Reserve Area² (*Kawasan Suaka Alam Laut*, KSAL). Based on Papua Province Spatial and Regional Planning (*Rencana Tata Ruang dan Wilayah*, RTRW), the area is classified as settlement area (from Nabire city to the east area of Wanggar River) and cultivation area (areas adjacent to Wanggar River) for plantations. According to Papua Province RTRW³, production

² Based on Minister of Forestry Decree No. SK.782/Menhut-II/2012 on The Amendment of Minister of Forestry and Plantation Decree No 891/KPTS-II/1999 on The Establishment of Forest Area in Irian Jaya Province in area +/- 42.224.840 Ha

³ Papua Province Regional Decree (Peraturan Daerah, Perda) No 23/2013 on RTRW Provinsi Papua Tahun 2013-2033.

forest areas (HP, HPT and HPK) were included in cultivation area, while protected forest areas and marine reserve were established as protected area.

Province and regional spatial policies in this area provide growth opportunities for forestry and non-forestry (including plantations) business without ignoring protection or conservation interests by maintaining protected forest and marine reserve inside the area proportionally. Conflicting interest might occur between cultivation and conservation. HCV assessment and management will open discussion spaces in how sustainable development in the area put economic, environment and social interests in equal stance.

3.3.2 Landscape Context

HCV Assessment Landscape (Area) is focused at SAP's HGU area and its adjacent areas. SAP assessment area is adjacent to PT Nabire Baru's HGU in the east. Both HGUs are situated in one single landscape. HCV values should be evaluated in landscape context. Landscape boundaries were determined by biophysical conditions (including rivers) and continuous forest cover from focus area to its surrounding, without ignoring relevant social conditions.

Table 21. Boundaries of PT SAP and PT NB HCV Assessment Landscape

	Boundary	Notes
North	Cendrawasih Bay	Along the coast, from Wanggar River estuary in the east to small estuary on the west of Warawi River.
East	Wanggar River Body	Territory boundaries of Wate Tribe customary right in Kampung Wanggar Pantai
West	Warawi River sub-watershed	Warawi River sub-watershed is situated in the east of Wasoi river
South	Up to plains (in MoRAP modelling)	Areas with plans landreform in the south side, in addition to several areas with hills landreform along Waomi River sub-watershed

These biophysical boundaries overlapped with customary right territory of Yeresiam Gua Tribe and Wate Tribe. The area was bounded by Wasoi River in the west and Ayaare River in the east. North boundary was along the coast from Ayaare River estuary in the east to Wasoi River estuary in the west. In the southeast, the area is adjacent to Kampung Erega near Yamor Lake, and in the southwest to Kampung Ororodo. Wate Tribes on Wanggar Pantai owned the land from Ayaare River in the west to Wanggar River in the east. The land stretched to the south up to mountain area near Kampung Warega. Specifically, SAP's HGU area was situated inside the territory of Yeresiam Gua Tribe (Yeresiam). This tribe consists of four sub-tribes: Waoha, Akaba, Sarakwari and Koroba.

SAP assessment area is located in Yaur District, Nabire Regency, Papua Province. Kampung Sima is a coastal village that currently houses 1,066 people divided into 120 households. Kampung Sima is the westernmost village of Yaur District. Local people must travel 13km to District center to get basic public services such as health service, civil service and education services (Junior High School and High School). Kampung Sima doesn't have village market, hence all trading activities are conducted at district or Nabire Central Market (88 km from Sima).

Most villagers work as fisherman. Other occupations are planters, lumbermen and workers at timber companies/oil palm plantations. Local livelihood patterns are not affected by season. At Kampung Sima, fish are still abundant and fishermen can earn daily income of Rp 250,000. The catches, mostly snappers, are sold to fish traders that come to the village every day. Plantation workers earn Rp 100,000 per day, which will be paid every fortnight. At present, none of the villagers practice hunting as their livelihood. Younger generation prefers other livelihood, such as working at timber mills or plantations.

Although registered as Christian, Sima villagers still hold faith to their sacred sites, preserving and practicing traditional rituals. Yerisiam Tribe adhered to specific rituals before entering sacred sites, such as Goa Nenggoina, Goa Nenggomana, Ruija, Rujahi and old village Hamuku. Not every people are allowed to enter Goa Nenggoina and Goa Nenggomana. According to ancestor tales, one must follow certain rules if one would like to enter the caves: speak only Yerisiam language inside the cave, wear no clothes (or wear leaves), bring no lighting, and only allowed to bring rattan thorns as weapon to hunt bats.

Aside as food staple, sago is also considered as traditional identify of Yerisiam tribe. Kampung Sagu, an area where sago (*Metroxylon sagu*) is cultivated, symbolize “mother that provide food”. Sago is served during traditional ceremonies, such as wedding ceremony, death ceremony, peace gathering, and hair cutting.

Similar to other native kampungs in Papua, Kampung Sima has a traditional institution consists of Chieftain and Customary Council (Dewan Adat), regulated through Local Regulations on Special Otonomy for Papua (Peraturan Daerah Otonomi Khusus, Perdasus). Traditional institution plays an important role in strengthening, straightening and providing justification for the ownership of customary lands, as well as enforcing and resolving violations against customary rules or values. Other formal institution in the village is Village Government, lead by Kepala Kampung (Head of Kampung). Kepala Kampung is aided by village secretary and other staffs. Kepala Kampung, as well as Camat, plays a greater role in the control and regulations of land and natural resources.

SAP Assessment landscape is adjacent to forest area of Teluk Cendrawasih Marine National Park in the north and Sima Protected Forest in the west. Teluk Cendrawasih Marine National Park is considered very important since it has a high level of endemic and threatened biodiversity, such as Whale Shark (*Rhincodon typus*), Green Sea Turtle (*Chelonia mydas*), Hawksbill Sea Turtle (*Eretmochelys imbricata*), Leatherback Sea Turtle (*Dermochelys coriacea*), Olive Ridley Sea Turtle (*Lepidochelys olivacea*), Dugong (*Dugong-dugong*), Ocean Sunfish (*Mola-mola*), Giant Clam (*Tridacna gigas*), as well as more than 1000 fish and 500 coral reef species. The park traditional utilization zone is adjacent to SAP assessment area.

Landscape area consists of one large landscape which contains several ecosystem types, namely: (1) Lowland Forest on Plains, (2) Lowland Forest on Hills, (3) Mountainous Lowland Forest, (4) Lowland swamp Forest, (5) Mangroves and Estuarine and (6) Lowland Grassland on Plains.

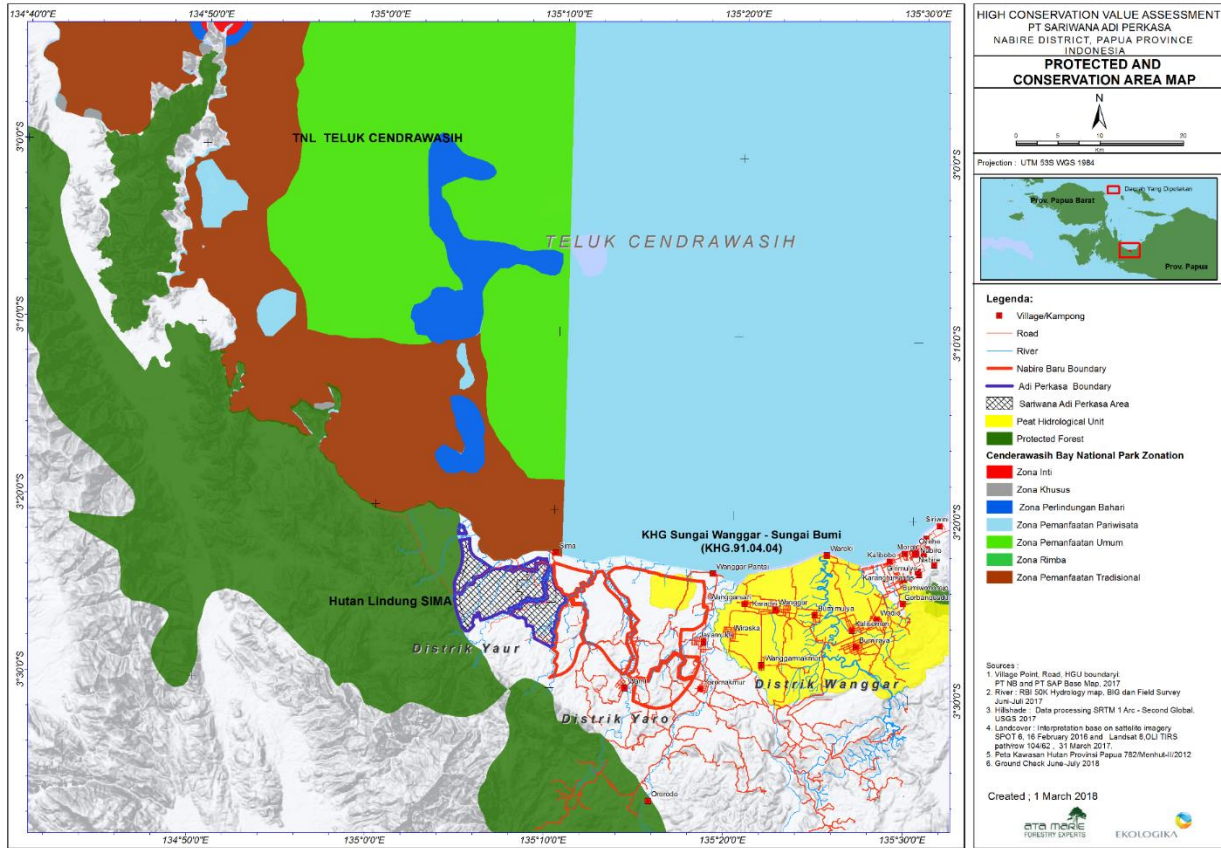


Figure 10. Conservation and Protection Area

Table 22. Ecosystem Types in Assessment Landscape

No	Ecosystem Type	Description
1	Lowland Forest on Plains	Secondary lowland forest on plains is dominated by Resak (<i>Vatica rassak</i> – Dipterocarpaceae), Matoa (<i>Pometia pinnata</i> – Sapindaceae), Kenanga (<i>Cananga odorata</i> (Lam.) Hook. f. & Thomson – Anonaceae). <i>Macaranga sp</i> (Euphorbiace) can be found easily, as this species is considered a pioneer species that signified forest clearing or harvesting. This ecosystem is the dominant ecosystem type in assessment area, extends from south to the north up to the coast.
2	Lowland Forest on Hills	Vegetation composition of this ecosystem type is indistinguishable to lowland forest on plains. This type can be found at the southern part of assessment area.
3	Mountainous Lowland Forest	Vegetation composition of this ecosystem type is indistinguishable to lowland forest on plains. This type can be found at the southern part of assessment area
4	Lowland Swamp Forest	This type has lower and more open canopy (up to 15 m), as well as lower species diversity, and dominated by <i>Terminalia spp</i> and <i>Campnosperma sp</i> . Lower canopy is interspersed by tall sago (<i>Metroxylon sagu</i>) (up to 15 m). The understory layer is filled by flood-resistant species. Common species are Pandan (<i>Pandanus spp</i>), <i>Phyllodendron spp</i> , herbs <i>Donax canniformis</i> and several Aroid species (<i>Cyrtosperma sp</i> . dan <i>Alocasia spp</i>).The forest is inundated all year long. The soil consists of peat and fine alluvial, with thick organic matters in the surface. This ecosystem type can only be found at several locations: near Kampung Sima (between Anak Sima River and Waomi River), south of Kampung Sima between Sima River and Anak Waomi River), around Amado River and Wagimaba River, and from west of Kampung Wanggar Pantai to Kampung Sima.
5	Mangroves and Estuarine	Estuarine is a transitional marine area (ecotone) between freshwater habitat and saltwater habitat. Estuarine is heavily affected by tides, location characteristics and its sloped morphology. Mangrove consists of vegetation on alluvial mud soil in coastal area and rivermouth affected by ocean tides. In this area, the mangrove is dominated by <i>Avicennia sp</i> and <i>Sonneratia sp</i> . Some spots of nipa palm can also be found more inland. This ecosystem type can be found in the coastal area Wanggar River.
6	Lowland Grassland on Plains	This ecosystem can be found on the southwest of Kampung Sima, as the location of Ruija sacred site. Located on a small flat expanse, this area is dominated by <i>Imperata spp</i> , <i>Saccharum spp</i> , and <i>Dicranopteris spp</i> on the edges adjacent to lowland forest. According to locals, this area is always a grassland and never been a forest. This ecosystem type is also heavily affected by human activities, such as periodic deer hunting with fire.

3.3.3 HCV Results and Justification

HCVRN provides general guideline in interpreting definitions and to identify HCV. Although HCV Identification Guidelines for Indonesia (2009) was published before the latest adjustments of HCV definitions (2012), this guideline is still the best practical guidelines for Indonesia. HCV identification in this assessment follows standard agreement on sub-categories, criteria and procedures on HCV existence confirmation and distribution, as explained in HCV Identification Guidelines for Indonesia 2009.

Table 23. Summary of HCV Identification for PT SAP based on HCVRN Guidance and Sub-category definitions for Indonesia as stated at Pedoman Penilaian NKT di Indonesia.

HCV Definition	HCV Sub-category	HCV Sub-category Description	HCV Identification Result
HCV 1 – Species Diversity Concentrations of biological diversity including endemic species, and rare, threatened or endangered (RTE) species that are significant at global, regional or national levels.	1.1	Areas that Contain or Provide Biodiversity Support Function to Protected or Conservation Areas	Present – Western area of PT SAP which is directly adjacent to Sima protected forest, a pristine area capable to support biodiversity in the area.
	1.2	Critically Endangered Species	Potentially Present – Black Spotted Cuscus (<i>Spiloglossus rufoniger</i>).
	1.3	Viable Populations of Endangered, Restricted Range or Protected Species	Present – 6 Vegetation types, 4 Mammals and 30 Avifauna.
	1.4	Habitat of Temporary Use by Species or Congregations of Species	Not Present – Species or species groups that need temporary habitat are not found
HCV 2 – landscape-level ecosystems and ecosystem mosaics, Undisturbed Forest Landscape 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.	2.1	Large Natural Landscapes with Capacity to Maintain Natural Ecological Processes and Dynamics	Not Present – No core areas with more than 20,000 ha within assessment area.
	2.2	Areas that Contain Two or More Contiguous Ecosystems	Present – Ecotone between lowland swamp forest and lowland forest
	2.3	Areas that Contain Representative Populations of Most Naturally Occurring Species	Present – Representation of natural species is shown from the presence of cassowary, species of Accipitridae family, species of Ducula genus, lorries and cockatoo, Kangaroo, hornbill and bird-of-paradise
HCV 3 – Ecosystem and Habitat Rare, threatened, or endangered ecosystems, habitats or refugia.	3		Present – Mountainous Lowland Forest, Mangroves and Estuarine, Lowland Grassland on Plains and Water bodies (lowland)
HCV 4 – Ecosystem Services Basic ecosystem services in critical situations including	4.1	Areas or Ecosystems Important for the Provision of Water and Prevention of Floods for	Present – All water bodies and their banks, lowland swamp forest ecosystem

HCV Definition	HCV Sub-category	HCV Sub-category Description	HCV Identification Result
protection of water catchments and control of erosion of vulnerable soils and slopes.		Downstream Communities	
	4.2	Areas Important for the Prevention of Erosion and Sedimentation	Present – hilly areas with natural vegetation which have a soil erosion potential value > 180 /ha/year
	4.3	Areas that Function as Natural Barriers to the Spread of Forest or Ground Fire	Present – Lowland Swamp Forest and Sima River (Sima River is >30 m in width)
HCV 5 – Community Needs Sites and resources fundamental for satisfying the basic necessities of local communities or indigenous peoples (for example for livelihoods, health, nutrition, water), identified through engagement with these communities or indigenous peoples.	5		Present – Area and natural resources fundamental for fulfilling basic needs, irreplaceable and traditionally/ sustainably managed by local people are present. Included are: sources of carbohydrate, protein, vitamin, direct income, potable water for drinking and cooking, clean water for sanitation, building materials (timber and non-timber)
HCV 6 – Cultural Values 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.	6		Present – Sacred sites: Goa Nenggoina, Goa Nenggomana, Ruija, Rujahi, Parigi Hamuku, old Kampung Hamuku, Sungai Busuk (Rarantiruma), Air Mabuk, Anapireoonggre (in Yaur language)/ Babrauguapi (in Yerisiam language) Important sites for local culture: Dusun Sagu Bokai, Dusun Sagu Kampung Sima, Dusun Sagu Manarueja, Dusun Sagu Nahina Mahire, Dusun Sagu Yarawobi Species with cultural importance: Bird-of-paradise, Sago (Metroxylon sagu)

3.3.3.1. Explanation of HCV 1 Identification – Species Diversity

Sub HCV 1.1 – Present	
Definition	Criteria
Areas that Contain or Provide Biodiversity Support Function to Protection or Conservation Areas	<ul style="list-style-type: none"> – Conservation areas near or inside concession area (with significant biodiversity) – Area that might provide biodiversity support function to protected or conservation areas near concession area – Area where operational activities might negatively affected biodiversity conservation function of a protected or conservation area.

In Indonesia, protected area and forest conservation system consists of conservation area and protection area. Protection area plays an important role in biodiversity conservation. Management activities within concession area should be able to ensure of to improve the preservation of support function of the area, and to reduce or to prevent operational impacts against biodiversity support functions.

In SAP assessment landscape and its surrounding, there are one conservation area and two protection areas, namely: Teluk Cendrawasih Marine National Park, Sima Protected Forest and Wanggar River-Bumi River Peat Hydrological Area. Teluk Cendrawasih MNP is 1.2 km in the north of SAP HGU area. Sima Protected Forest is directly adjacent to SAP HGU. Indicated Wanggar River-Bumi River Peat Hydrological Area (KHG.91.04.0421) is 10 km from the east boundary of SAP HGU.

Forest inside SAP HGU is connected to Sima Protected Forest. This area has potential as habitat for several RTE species (6 vegetation species, 4 mammals, and 30 avian species – see HCV 1.3) and one CR species, Black Spotted Cuscus (*Spiloglossus rufoniger*). Therefore the area not only support biodiversity inside concession area, but also support biodiversity in Sima Protected Forest.

Forest cover in this area is still relatively excellent (identified as Forest and Young Regeneration Forest), which means rivers inside the area (Mamahi, Sima, Wainduri, Rarangkika, Wagirimaba) that flow into Cendrawasih Bay still be able to support biodiversity presence in the marine nature reserve, however indirectly. Management activities that might disturb the presence of biodiversity is sedimentation, as the result of infrastructure and plantation construction. This matter is important and shall be included in HCV 4.1.

Most of Wanggar River-Bumi River Peat Hydrological Area is not considered as forest ecosystem anymore. Transmigration settlements, plantation and farmlands were build in the area. Therefore, there are not many areas that can support biodiversity. HCV 1.1 is present for forest that connected to Sima Protected Forest in the west side, which still provide support for biodiversity in the protected/conservation area.

Sub HCV 1.2 – Potentially Present	
Definition	Criteria
Critically endangered species	Critically endangered species (or sub-species) based on IUCN Red List

Interview result indicated that Black spotted Cuscus (*Spiloglossus rufoniger*) can still be found in dry forest areas in the southern part of assessment area, especially in the hills. Villagers can easily distinguish this species from Spotted Cuscus (*Spiloglossus maculatus*) that is easily encountered in forest near settlements/villages. Based on land cover and habitat preference, this species is predicted to present within PT SAP area. Data on distribution and population of this species is very limited and dated. The species is classified as CR (Critically Endangered) on IUCN Red List. Therefore, due to precautionary principles, HCV 1.2 is considered potentially present until further supporting data is obtained.

Sub HCV 1.3 – Present	
Definition	Criteria
Viable Populations of Endangered, Restricted Range or Protected Species	<ul style="list-style-type: none"> – All CR, EN, VU species as listed on IUCN Red List – Restricted range species occurred in one island or part of it – Species protected by Indonesia Law (Law no 5/1990) – Species listed on CITES Appendix I and II

Vegetation: Within assessment landscape, 6 vegetation species classified as Endangered (EN) and Vulnerable (VU) according IUCN Red List are found. They are *Flindersia pimenteliana* (Rutaceae) (EN), Merbau (*Intsia bijuga* – Fabaceae), Angsana (*Pterocarpus indicus* – Fabaceae), Pala Hutan (*Myristica subalulata* – Myristicaceae) (VU), Buah Taer (*Anisoptera thrurifera polyandra* – Dipterocarpaceae) (VU), dan Gaharu (*Aquilaria filarial* – Thymelaeaceae) (Appendix II). These species are categorized as HCV 1.3. All six species are found in relatively good forest habitat. During assessment, *Flindersia pimenteliana* (Rutaceae) (EN) and Merbau (*Intsia bijuga* – Fabaceae), were encountered in lowland forest and lowland swamp forest. The rest were encountered only in lowland forest.

Mammalia: Four mammal species are considered as HCV 1.3: three Phalangeridae Familia (Black Spotted Cuscus (*Spiloglossus rufoniger*) – CR, Common Spotted Cuscus (*Spiloglossus maculatus*) – CITES Appendix II, PP no 7/1999, Phalanger orientalis - PP No 7/1999), and Lao-lao (Forest Wallaby, *Dorcopsis muelleri* – Macropodidae) – VU, PP No 7/1999, endemic. Phalanger orientalis and Common spotted Cuscus (*Spiloglossus maculatus*) are relatively easy to find, especially during the night in most of the remaining forest, from swamp forest along the coast to lowland forest. Lao-lao can be found in the western area of SAP HGU, in lowland forest.

Although total population encountered during field assessment is less than 30 individuals, it is estimated that the actual total population within concession area is more than 30 individuals, and considered viable²⁴. The population of Lao-lao (*Dorcopsis muelleri*) is estimated to be high, since this species were often seen crossing the roads in SAP HGU. Deer (*Rusa timorensis*) although classified as protected species, is not a Papuan endemic species.

Therefore, deer is not classified as HCV 1.3. As an introduced species, deer is considered as competitor for endemic species. Deer also inhibits the growth of seedlings and saplings of pohon Merbau (*Intsia bijuga*)²⁶. Besides, based on local regulation (KepMenHutBun No. 632/Kpts-VI/1998), deer is allowed to be hunted with quota system, which prevents negative impacts against traditional hunting activities.

Birds: Total 69 species are found. Thirty species are classified as HCV 1.3, consists of five species of Psittacidae, Accipitridae family, four species of Alcedinidae family, 3 species of Paradisaieidae dan Loriidae family, 2 species of Nectariniidae dan Cacatuidae family and 1 species of each family of Ardeidae, Bucerotidae, Casuariidae, Cuculidae, Dicaeidae and Meliphagidae. Almost all bird species were

easy to find. Most often encountered were Rangkong Papua (*Rhyticeros plicatus*), Kakatua Koki (*Cacatua galerita*) and Chikua kua tanduk (*Philemon buceroides*), which were spread in all ecosystem types. Rangkong Papua (*Rhyticeros plicatus*) and Kakatua Koki (*Cacatua galerita*) often seen in small flocks of 3-4 individuals in the north and south area, and in the remaining forest along rivers (Ibonama, Sima, Warawi, Kalibambu, and Waomi river).

On HCV 5 section, two herpetofauna species will be mentioned as protein source, namely Soa Soa (*Hydrasaurus amboinensis*) and Crocodile (*Crocodylus spp*). These two species are classified as protected under the Law no 5/1990 on the Conservation of Natural Resource and their Ecosystem, and PP no 7/1999 on the Preservation of Flora and Fauna. Although some locations are deemed as suitable habitat to support the presence of the two species, team did not encounter any individuals from these two species for the duration of field survey.

Although total population of each species encountered during field assessment is less than 30 individuals, it is estimated that the actual total population within concession area is more than 30 individuals, and therefore classified as HCV 1.3. Vegetation species composition and forest structure that relatively “natural” and capable to support the presence of these species is established as HCVA 1.3. In short, HCVA 1.3 consists of all natural forest ecosystem within assessment landscape, based on habitat preference of encountered species. Therefore, lowland forest, swamp forest and mangrove and estuarine are established as HCVA 1.3.

Table 24. List of HCV 1.3. Bird Species in SAP

No	Common Name	Scientific Name	Familia	CITES	PP	Endemic
1	Grey Goshawk	<i>Accipiter novaehollandiae</i>	Accipitridae	II	P	
2	Doria's Goshawk	<i>Megatriorchis doriae</i>	Accipitridae		P	
3	Pacific Baza	<i>Aviceda subcristata</i>	Accipitridae	II	P	
4	Collared Sparrowhawk	<i>Accipiter cirrocephalus</i>	Accipitridae	II	P	
5	Brahminy Kite	<i>Haliastur indus</i>	Accipitridae	II	P	
6	Sacred Kingfisher	<i>Todiramphus sanctus</i>	Alcedinidae		P	
7	Rufous-bellied Kookaburra	<i>Dacelo gaudichaud</i>	Alcedinidae		P	
8	Hooked-billed Kookaburra	<i>Melidora macrorrhina</i>	Alcedinidae		P	
9	Red-breasted Paradise-kingfisher	<i>Tanysiptera nympha</i>	Alcedinidae		P	E
10	Yellow-billed Egret	<i>Ardea brachyrhyncha</i>	Ardeidae		P	
11	Papuan Hornbill	<i>Rhyticeros plicatus</i>	Bucerotidae	II	P	
12	Sulphur-crested Cockatoo	<i>Cacatua galerita</i>	Cacatuidae		P	
13	Palm Cockatoo	<i>Probosciger aterrimus</i>	Cacatuidae	I		
14	Northern cassowary	<i>Casuarius unappendiculatus</i>	Casuariidae		P	
15	Brush Cuckoo	<i>Cacomantis variolus</i>	Cuculidae	II		
16	Olive-crowned Flowerpecker	<i>Dicaeum pectorale</i>	Dicaeidae			E
17	Red-flanked Lorikeet	<i>Charmosyna flacensis</i>	Loriidae	II		

No	Common Name	Scientific Name	Familia	CITES	PP	Endemic
18	Coconut Lorikeet	<i>Trichoglossus haematodus</i>	Loriidae	II		
19	Black-capped Lory	<i>Lorius lory</i>	Loriidae	II		
20	Helmeted Friarbird	<i>Philemon buceroides</i>	Meliphagidae		P	
21	Olive-backed Sunbird	<i>Cinnyris jugularis</i>	Nectariniidae		P	
22	Black sunbird	<i>Leptocoma aspasia</i>	Nectariniidae		P	
23	Lesser Bird-of-paradise	<i>Paradisaea minor</i>	Paradisaeidae	II	P	
24	Magnificent Riflebird	<i>Lophorina magnifica</i>	Paradisaeidae		P	
25	Twelve-wired Bird-of-paradise	<i>Seleucidis melanoleucus</i>	Paradisaeidae		P	
26	Moluccan King-parrot	<i>Alisterus amboinensis</i>	Psittacidae	II		
27	Red-cheeked Parrot	<i>Geoffroyus geoffroyi</i>	Psittacidae	II		
28	Eclectus Parrot	<i>Eclectus rotatus</i>	Psittacidae	II		
29	Orange-fronted Hanging-parrot	<i>Loriculus aurantiifrons</i>	Psittacidae	II		
30	Yellow-capped Pygmy	<i>Micropsitta keiensis</i>	Psittacidae	II		

Notes

- IUCN : CR (Critically Endangered/*Kritis*), EN (Endangered/*Genting*), VU (Vulnerable/*Rentan*)
 CITES : Appendix I: species whose utilization is subject to strict regulations, so as not to jeopardize their survival
 Appendix II: species that has not been threatened but will be threatened with extinction if excessively exploited
 PP : Protected base on Law no 5/1990 and PP no 7/1999
 E : Endemic (<http://datazone.birdlife.org/eba/factsheet/172>, <http://datazone.birdlife.org/eba/factsheet/176>)

Sub HCV 1.4 – Not Present

Definition	Criteria
Habitat of Temporary Use by Species or Congregations of Species	Certain species that needs a specific habitat in their lif cycle, where they congregate, stay, breed, migrate, etc is considered as keystone habitat

No keystone habitat found in assessment landscape. Although some migratory bird species are present (*Todirhamphus sancta*, *Merops ornatus* and *Eurystomas orientalis*), these species commonly reside in various ecosystem type, including disturbed ones (such as homegardens). They are also highly adaptable, which made their supporting areas not critical or not significant. In Papua, all mammal species are not migratory species, and not needed certain habitat in their lifecycle.

3.3.3.2. Explanation for HCV 2 Identification - Landscape-level ecosystems and ecosystem mosaics, Undisturbed Forest Landscape

HCV 2.1 – Not Present

Definition	Criteria
Large Natural Landscapes with Capacity to Maintain Natural Ecological Processes and Dynamics	Core Area >20,000 ha consists of unfragmented natural habitat

Based on ground check and GIS analysis, unfragmented landscape is not present. SPOT 6 satellite imagery recorded on 16 February 2016 and Landsat 8, OLI TIRS path/row 104/62 recorded on 31 March 2017 shown that the remaining forest area is 23,058 ha, not yet buffered into 3 km, made the core zone less than 20,000 ha.

Intact Forest Landscape (IFL), as determined by Global Forest Watch, is present within the HCV assessment landscape (see Map 3) but not within the SAP HGU. Some part of IFL around the upstream of Warawi, Wasoi and Wami rivers suffered from degradation as these areas were used as logging paths. Moreover, this area is classified as APL and Production Forest, included in IUPHHK-HA concession of Jati Dharma Indah. On the west side near Ibonama River to the north, the forest was also degraded due to its proximity to Trans Papua Road from Nabire Regency to Teluk Wondama Regency.

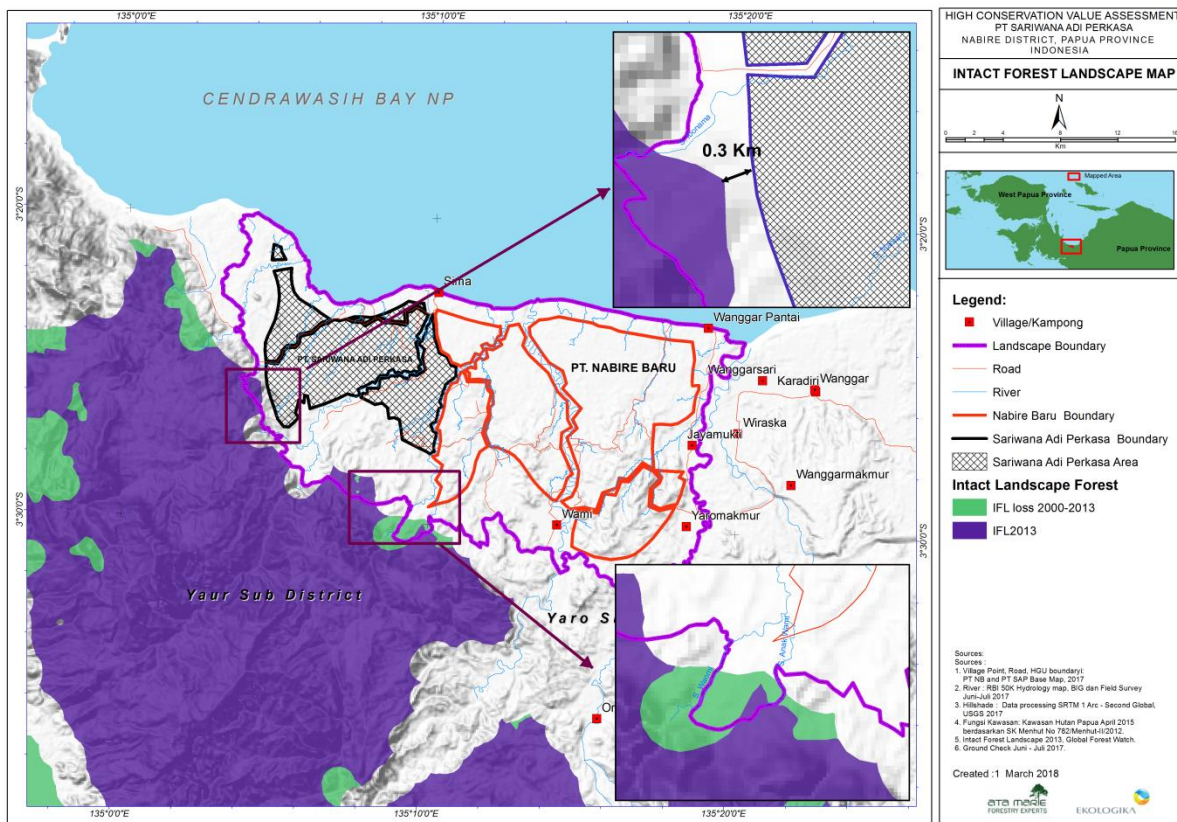


Figure 10. IFL Map in and around PT SAP area

HCV 2.2 – Present	
Definition	Criteria
Areas that Contain Two or More Contiguous Ecosystems	Area should have two or more continuous representative ecosystem within landscape – with ecotone/ecoline

Ecosystem mapping and ground check show the presence of six ecosystem types: (1) Lowland Forest on Plains, (2) Lowland Forest on Hills, (3) Mountainous Lowland Forest, (4) Lowland swamp Forest, (5) Mangroves and Estuarine and (6) Lowland Grassland on Plains. On assessment area, ecotone is found,

detected between swamp forest and lowland forest on plains. Therefore all boundaries between the two ecosystem types is established as HCVA 2.2.

HCV 2.3 – Present	
Definition	Criteria
Areas that Contain Representative Populations of Most Naturally Occurring Species	Extensive area with surrogate biodiversity/landscape necessary to support such species.

Identification process for HCV 2.3. is as follows: 1) Identify representative/proxy species to assess wider scale area necessary for HCV 2.3, for example group/individual belongs to wide range and low density species; 2) Identify accurate representative/proxy species for natural species composition inside landscape; 3) Based on HCV Identification Toolkit, natural area identified as HCV 1.1 and HCV 2.2 should be considered as potential area of HCV 2.3.

Table 25. Groups of HCV 2.3 Proxy Species in SAP Assessment Landscape

Key Species	Description	Species names
Cassowary	Cassowary is an animal with extensive range and low density important for distributing seeds and fruits. This species is suitable as indicator to represent natural landscape	Northern Cassowary (<i>Casuarius unappendiculatus</i>)
Kangaroo	Kangaroos is the largest native herbivore occurring in Papua rainforest. This animal plays an important role for the function of landscape. Currently, its role is marginalized by the introduction of pigs and deer. Pigs have been present in this island for more than 25,000 years (Flannery,1995), while deer was introduced by the Dutch 80 years ago and only recently distributed to various part of Papua by immigrants. Both species have the potentials to disrupt normal species composition within a landscape. Therefore, monitoring of native herbivore species is essential.	Lao-lao/Wallaby (<i>Dorcopsis muelleri</i>)
Eagles	Most eagles are capable to live in various habitat, including disrupted habitat and forest mozaic. However, the presence of these species in a certain area indicated various prey species available and a healthy ecology at the landscape scale.	Grey goshawk (<i>Accipiter novaehollandiae</i>) Doria's goshawk (<i>Megatriorchis doriae</i>) Pacific baza (<i>Aviceda subcristata</i>) Collared sparrowhawk (<i>Accipiter cirrocephalus</i>) Brahminy kite (<i>Haliastur indus</i>)
Pigeons	Among five large lowland Papua pigeon species, three are present in this area. As tall forest and egde forest species, these pigeons can be identified easily by their sounds	Collared imperial pigeon (<i>Ducula mullerii</i>) Zoe's imperial pigeon (<i>Ducula zoeae</i>) Pinon's imperial pigeon (<i>Ducula pinon</i>)
Lories and Cockatoo	Ten species of lories and cockatoo have been identified within assessment area. These bird varied in size, food preferences and nesting preferences, from the very small Perkici	Coconut lorikeet (<i>Trichoglossus haematodus</i>) as the smallest; Palm cockatoo (<i>Probosciger aterrimus</i>) as the largest; Moluccan king parrot (<i>Alisterus amboinensis</i>); Red-cheeked parrot

Key Species	Description	Species names
	Pelangi (<i>Trichoglossus haematodus</i>) to the huge Kakatua Palem (<i>Probosciger aterrimus</i>). The presence of these species in landscape is the best indicator and most suitable proxy for natural landscape condition.	(<i>Geoffroyus geoffroyi</i>); Eclectus parrot (<i>Eclectus roratus</i>); Orange-fronted hanging parrot (<i>Loriculus aurantiifrons</i>); Yellow-capped pygmy parrot (<i>Micropsitta keiensis</i>); Red-flanked lorikeet (<i>Charmosyna flaccida</i>); Rainbow lorikeet (<i>Trichoglossus haematodus</i>); Black-capped lory (<i>Lorius lory</i>); Sulphur-crested cockatoo (<i>Cacatua galerita</i>), Kakatua raja (<i>Probosciger aterrimus</i>)
Hornbill	Papua hornbill has an extensive range that is important for the distribution of fruit seeds in all part of the landscape. The presence of this easily recognized species in the landscape displays the general impact in the landscape overall.	Papuan hornbill/ Blyth's hornbill (<i>Rhyticeros plicatus</i>)
Bird of paradise	Three species bird of paradise can be found in this area. Each species lives in different niche habitat in the forest. <i>Seleucidis melanoleuca</i> prefers swamp forest and flat lowland rainforest, while <i>Paradisaea minor</i> likes to perch in tall trees with open canopy. The combination of these species is useful and easily recognized (from their sound) as the representative of natural composition of the landscape.	Lesser bird-of-paradise (<i>Paradisaea minor</i>), Magnificent Riflebird (<i>Lophorina magna</i>), Twelve-wired bird-of-paradise (<i>Seleucidis melanoleucus</i>).

3.3.3.3 Explanation for HCV 3 Identification – Ecosystem and Habitat

HCV 3 – Present	
Definition	Criteria
Rare, threatened, or endangered ecosystems, habitats or refugia.	<ul style="list-style-type: none"> - Threatened Lose 50% or more of initial area of a biogeographical ecosystem unit. Will lose 75% or more of the initial area, based on the assumption that all HPK/APL area will be converted. - Rare: natural ecosystem that covers less than 5% of biogeographical area.

Analysis to rare and threatened status, implemented to the greater geographical unit, was conducted based on HCV 3 criteria above. If the current range of a regional proxy ecosystem has dwindled more than 50% of its historical distribution for Northern Papua or specific for concession area, such ecosystem is considered threatened. If current range of a regional ecosystem is less than 5% of total range of all natural ecosystem in the area, the ecosystem is considered rare.

Based on the calculation of proxy ecosystem and ground check, a rare ecosystem is found in the area: Grassland on Plains ecosystem, Mountainous Lowland Forest ecosystem, mangrove and estuarine ecosystem and in water bodies/lakes. Although these ecosystem are identified as high conservation value area, SAP does not have any area that is important for the management of this HCV 3 within its HGU area.

3.3.3.4. Explanation for HCV 4 Identification – Ecosystem Services

HCV 4.1 – Present	
Definition	Criteria
Areas or Ecosystems Important for the Provision of Water and Prevention of Floods for Downstream Communities	<p>Forest in watershed area is in good condition and able to function in regulating water in downstream area.</p> <p>Forest in watershed is in good condition and able to function in regulating water in downstream area. If the area provide services to supply water or prevent flood</p> <p>Forest ecosystem, such as cloud forest, montane ridge forest, riparian ecosystem, karst forest, wetland ecosystem including peatland, grassland, have a significant hydrological function</p>

High rainfall in Central Papua area frequently causes annual flood in the assessment area. In general, forest cover condition in the banks of Sima River, Rarangkika River, Amando River, Wainduri River, Wagirimaba River, Mamahi River, Ibonama River and Karang Tikar River are in good condition. Natural vegetation that can help control flood is still present. Existing swamp forest ecosystem is crucial in controlling flood and providing fresh water.

HCV 4.2 – Present	
Definition	Criteria
Areas Important for the Prevention of Erosion and Sedimentation	Forest area with steep slopes and Soil Erosion Potential (Tingkat Bahaya Erosi, TBE) >180 ton/ha/year, good forest cover to prevent erosion, landslide and sedimentation.

Based on field observation and GIS analysis, the Soil Erosion Potential in SAP area is low to very high (TBE>180 ton/ha/year) with slope gradient >40%. Hills within assessment area generally have excellent understory and vegetation, that must be protected to prevent erosion due to high rainfall. Therefore, area with TBE>180 ton/ha/year is considered important to control erosion and sedimentation.

HCV 4.3 – Present	
Definition	Criteria
Areas that Function as Natural Barriers to the Spread of Forest or Ground Fire	Natural forest with good condition is not prone to fire. For example, a peat forest with an intact hydrology system, swamp forest, wetlands, and other green lines consists of fireproof plants will be able to deter forest fire..

NASA hotspot data 2012-2016 recorded by MODIS C6 and VIRST satellite revealed that within PT SAP area hotspots did not present. However, based on interview, on 1982, a huge fire hit Sima Village. Fires or hotspots frequently caused by human activities.

Forest or wetland ecosystem can prevent the spread of forest fire. Therefore such area/ecosystem has an important value as natural fire barriers. River Sima and swamp forest ecosystem (east of Amando River and east of Sima village) play a significant role as natural fire barriers.

3.3.3.5. Explanation for HCV 5 Identification – Community Needs

HCV 5 – Present	
Definition	Criteria
Sites and resources fundamental for satisfying the basic necessities of local communities or indigenous peoples (for example for livelihoods, health, nutrition, water), identified through engagement with these communities or indigenous peoples.	Sites or natural resources fundamental for satisfying substantial basic needs of local community, irreplaceable, and managed in traditional and/or sustainable manner by its user/owner/manager.

Most houses in Kampung are stilt house, constructed from timber and wood plank with zinc sheets as roofs. Only a small number of houses that built with cement and bricks. People use modern household items from plastic and metal, obtained from local market. Some work tools are also modernized, such as fishing rods and nylon nets.

Clean water for drinking and bathing/washing is drawn from dug wells commonly found in most house. A three meter deep well is able to supply fresh water in adequate quantity yearlong. Some families share a well with other families since not every family have their own well.

Kampung Sima receive government assistance, such as Program Nasional Pemberdayaan Masyarakat Mandiri (PNPM), which were spent to build village infrastructure and renovate houses. Kampung Sima also receive Alokasi Dana Desa (Village Allocation Fund) each year. This village is not yet connected to PLN power grid, so the people still use gasoline generator for electricity and oil lamps.

To cook, people use firewood, collected from homegardens and customary lands. Commonly used as firewood are merbau, matoa, agatis, and bamboo. Firewood also sold at Rp 5,000 a bunch. Kerosene use is also widespread, which is sold at Rp 10,000 per liter. Some people also use LPG, sold at Rp 30,000 – Rp 40,000 per tank. Based on these facts, people decided that firewood is not classified as HCV. Common livestock are chicken, ducks, and pigs, raised unfenced.

Assessor has identified, consulted, and established in participatory manner HCV 5 attributes, divided into several category based on community needs. Significant and critical analysis was conducted through FGD and re-established through consultation with community representatives.

Table 26. HCV 5 Assessment Result in PT SAP

Groups	Attributes
Carbohydrate Source	Natural and cultivated sago Tubers (betatas, ubi jalar, singkong, sukun hutan)
Protein Source	Freshwater fish: Ikan gabus, lele, bethik, tawes, gurami, nila Brackish water fish: bolana/belanak (mullet fish), somasi (bass), kakap putih (baramundi), kakap merah (mangrove jack) Saltwater fish: kombong, mumar, oci, cakalang, tengiri, barakuda, layur, goropa, bobara, gumuru, ikan besi, sako, puri
	Non-fish: eel, prawn, crab, soa-soa, snake, crocodile, kerang/bia, ulat kayu bakau, bats, octopus, suntung,
Freshwater for Drinking and Cooking	Well (groundwater), Springs
Freshwater for Sanitation	Well (groundwater), River
Direct Income Source	Marine products: kombong, mumar, oci, cakalang, tengiri, barakuda, layur, goropa, bobara, gumuru, ikan terbang, sako, udang, kepiting, bia, gurita, suntung, puri, halus/nasi
Construction Material – Timber	Timber: merbau, matoa, agatis, damar, masoi, empaka, lawang
Construction Material – Non Timber	Nibung stem and leaves Rattan
Vitamin Source	Forest fruit (cempedak, dll)

3.3.3.6. Explanation for HCV 6 Identification – Cultural Values

HCV 6 – Present	
Definition	Criteria
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.	Sites, resources, habitat and lanscape with high cultural value, recognized by national policy and legislation Sites, resources, habitat and lanscape established legally from national government and/or international institution such as UNESCO Sites, resources, habitat and lanscape with recognized important historical and cultural value, even if not protected by legislation. Religious or sacred sites, resources, habitat and lanscape (cemetery, or site for traditional rites, which is important to local community) Plants or animal with totemic value or used in traditional ceremonies.

The only UNESCO World Heritage Site in Papua Province is Lorentz National Park, that spans across several Regencies (Asmat, Intan Jaya, Jaya Wijaya, Lanny Jaya, Mimika, Nduga, Paniaia, Puncak Jaya, Yahokimo). The National Park is 189 km from assessment landscape and there is no known link between Yerisiam and Wate Tribe, and various tribes currently residing in the National Park (Amungme/Damal, Dani Barat, Dani Lembah Baliem, Moni, Nduga, Asmat, Kamoro dan Sempan).

Among the 107 national cultural heritages (objects, buildings, structures, sites, area) according to Ministry of Education and Culture²⁹, none of them are located at Papua Province. According to Balai Arkeologi Papua, Jayapura, there is no enactment or proposition for local (province) cultural heritage inside SAP landscape or Nabire district. “Sacred sites” or “important cultural sites for local communities” mentioned in Table 9 should be regarded as “sites with recognized important historical and cultural values, even if not protected by legislation”.

Bat hunting in Goa Nenggoina and Goa Nenggomana is only part of origin stories for the two sacred sites. Currently, no one knows when and who was the last person brave enough to enter the caves. The hunting itself was not acknowledged by Yerisiam Gwa tribe as an important part of their cultural tradition.

Assessor has identified HCV 6 attributes through FGDs, consulted and established them in participatory manner through consultation with community representatives.

Table 27. Summary of Identified HCV 6 Attributes and Locations in PT SAP

No.	Group	Location	Attribute
1	Sacred Sites	Sima	<i>Goa Nenggoina</i>
		Sima	<i>Goa Nenggomana</i>
		Sima	<i>Rujja</i>
		Sima	<i>Rujahi</i>
		Sima	<i>Parigi Hamuku</i>
		Sima	<i>Bekas Kampung Hamuku</i>
		Sima	<i>Sungai busuk (Rarantiruma)</i>
		Sima	<i>Air Mabuk</i>
		Sima	<i>Anapireoonggre (in Yaur language)/ Babrauguapi (in Yerisiam language)</i>
2	Culturally important locations	Sima	<i>Dusun Sagu Bokai, Dusun Sagu Kampung Sima, Dusun Sagu Manarueja, Dusun Sagu Nahina Mahire, Dusun Sagu Yarawobi</i>
3	Important species for traditional culture	Sima	Birds of Paradise, Sago (<i>Metroxylon sago</i>)



Dusun Sagu of Kampung Sima



Sacred site Ruija at Kampung Sima

Figure 11. Photos of HCV 6 sites

3.3.4. Stakeholder Consultation

Consultation with local communities and key traditional community figures was done during FGD and participatory surveys of HCV 5 and 6. HCV Assessment results at the village level were consulted with a broad group of village members (20 - 25 August 2017) to obtain agreement on the results themselves as well as management and monitoring HCVs – freely and without coercion so that the consequences of HCV identification and their management were fully understood. Inputs of the consultation have been incorporated in the final assessment report.

For wider stakeholder consultation, stakeholder consultation workshops were held prior to (8 June 2017) and after the assessment (30-31 Agustus 2017) and attended by government organisations, NGOs, high education, traditional community organisations, faith based organisations, and private sector operating in the landscape. Community representatives, Village government, and District government were also in attendance during the post-assessment stakeholder consultations.

During the post assessment consultation workshop, results of HCV identification and their distribution (HCVA) were presented. Threats to the HCV and recommendations for management and monitoring – including all maps that showed management areas of HCV were discussed. One issue that was consulted at length included the areas of HCVA that overlap with the planned smallholder (plasma) areas. In general, all representatives of local communities expressed concern that areas of HCVA will reduce the area of their “plasma”. However, it is necessary for the company to enforce the management of HCV 1-4 in accordance to Goodhope Sustainability Policy and communicate the policy to tribe representatives. Assessor also received two Letter of Statement, one dated 7 September 2017, from the representative of Wate Tribe Indigenous Group (from Wanggar Pantai Village) and Waoha Tribe Indigenous Group (from Sima Village); and another dated 8 September 2017 from the representative of Akaba Tribe, Sarakwari Tribe and Koroba Tribe (Sima Village). Summary of stakeholder consultation can be found in Table 29.

Table 28. Summary of Stakeholder Consultation Results

Date	Name (Organization/Expertise)	Concern and Recommendation	Assessor Response
Workshop (8 June 17)	Andre Barani (Yayasan Pusaka)	Yayasan Pusaka conducted participatory mapping on important areas for community, especially sago, with different result compared to mapping conducted by company.	<p>Social survey will allocate sufficient resource and time for a rapid survey in/with communities/tribes in Sima Village.</p> <p>Assessor will use “participatory map” both from Yayasan Pusaka and company. (Up to the end of the survey, Yayasan Pusaka did not share their map version)</p> <p>Social survey will conduct ground check or participatory mapping for HCV-HCS assessment purposes: important livelihood areas and culture</p>
Workshop (8 June 17)	Amon Rumatarai (Fishery Office)	A special assessment is necessary to map areas, since in Papua creating village area map is difficult if based on customary map	Survey that will be conducted is rapid survey, therefore such request is beyond the scope and capacity of this survey. The suggestion will be put in recommendation on HCV and spatial management.
Workshop (8 June 17)	Andre Barani (Yayasan Pusaka), Gunawan (Yeresiam Gwa Tribe), Herman Sayori (Nabire Customary Council/ <i>Dewan Adat</i> Nabire), Petrus Amafnini (Sawit Watch)	<p>Survey area must be informed to local communities/tribes</p> <p>Identification must be conducted together with elders and communities in Sima Village. Do not ignore people in Sima Village.</p> <p>Implementation of FPIC principles in relation to performance and future planning.</p>	HCV survey method and approach (including for HCV 1-3) is participatory, including village level consultation (note: FPIC, HCV/HCS management). Team will invite and involve chieftain in village consultation and stakeholder consultation.
Workshop (8 June 17)	Robertino Hanebora (Yerisiam Tribe member)	Strategy to transfer HCV knowledge (terminology, concept, practices) to local community is necessary	Will be conducted in adherence to good practices during FGD with local community, village consultation, FPIC will be practiced. Assessor will provide concise document of HCV identification results, management and monitoring recommendations, and thematic maps which deemed necessary or based on request, as long as within authorization level and

Date	Name (Organization/Expertise)	Concern and Recommendation	Assessor Response
			assessment purpose
Workshop (8 June 17)	Yoteni (Regional Disaster Management Agency)	Potential of impact of oil Palm plantation on available water resources in the river buffer – could result in communities not having enough water.	Identify potential internal threats on water availability at present and into the future. Recommendation for management of HCV / HCVA for conservation of water resources, especially the continued monitoring of availability for communities (HCV 4.1 and HCV 5).
Workshop (8 June 17)	Andre Barani (Yayasan Pusaka), Yakonias Yoweni (Sima Village)	The company is thought to have already destroyed several areas of livelihood and cultural importance to local communities (Sago groves and sacred areas in Akhiya and Ruhija). Need to find a solution for these areas that have been lost to oil palm.	Clarify through <i>ground checks</i> and participatory mapping in the field. Results delivered to the community affected. Follow-up solutions are the responsibility of the company.
Workshop (8 Jun 17)	Herman Sayori (Nabire Customary Council), Gunawan (Yerisiam Gwa Tribe), A. Hamid (Teluk Cendrawasih National Park Office, Regional I Nabire), M. Y. Runaki (Plantation and Agricultural Office)	<i>Dusun Sagu</i> must be protected – as local identity, and should not be converted into oilpalm plantation (<i>plasma</i> or <i>core</i>). The locations of <i>Dusun Sagu</i> should be mapped in participatory manner	<i>Dusun Sagu</i> will be mapped participatory (Participatory Mapping Report) during HCV survey. <i>Dusun Sagu</i> as HCV 5 had been confirmed through FGD in village level, and consulted in village consultation. Local people/cooperative should decide whether or not they will release <i>Dusun Sagu</i> area from <i>plasma</i> area planning. Check HCV 5 map and Chapter on synthesis.
Workshop (8 Jun 17)	Herman Sayori (Nabire Customary Council), John Weah (Satya Wiyata Mandala University/USWIN)	Review on HGU area (reserve area, planting area, planted area) to resolve conflict between company and local tribes.	Synthesis map will be provided in the report – to give recommendation on rearrangement.
Workshop (8 Jun 17)	Yoteni (Regional Disaster Management Agency)	Protection in the HCV approach – need to ensure not only conservation of the areas but alsoi population of important species (i.e. Birds of Paradise)	The aims of HCV management should be focused on the intrinsic value not on forest or no-go areas. Recommendation for HCV management will be supplemented to ensure this.

Date	Name (Organization/Expertise)	Concern and Recommendation	Assessor Response
Workshop (8 Jun 17)	A. Hamid (Teluk Cendrawasih National Park Office, Regional I Nabire)	PHKA 2012 regulations for identifying and inventory of Essential Ecosystem Areas (<i>kawasan ekosistem esensial</i>) for wetlands and dryland can be used as basic approach for HCV management	Assessors used recommendations for management that are inline with the conservation principles of Essential Ecosystem Areas (e.g. corridors).
Workshop (8 Jun 17)	Manuel Miniro (Natural Resource Conservation Agency/ Teluk Cendrawasih Marine National Park)	Need to identify the operational impact of PT SAP on the national Park (Sima area)	Analysis on links between company operations and conditions of concession area with Teluk Cendrawasih NP. Impacts of plantation – including utilization limit of HCV management area, should not divert risk of exploitation to NP.
Workshop (8 Jun 17)	Petrus Amafnini (Sawit Watch)	Riparian strips along rivers are not just 50m, but can be 100 or 150m wide. Peat forest ecosystems should be excluded from the planting areas.	Assessor will follow Keppres No. 32 / 1990, PP No.26/2008, PP No.38/2011 regulations but also adopt RSPO Riparian management and monitoring.
Community Meeting (22 Aug 17) (at Traditional House Sima Village)	Sima Village, 24 partisipan: Daniel Inggeruhi (Village official); Benni Yarawobi (Secretary of Cooperative); Marariampi, Meliamus Yarawobi, Benni Inggeruhi, Demianus M, Amelia Akubar, Agus Runggearai, Otis R, Lis Rumaterai, Yuliana Akubar, Yuspina Henawi, Yurmina Monei, Yan W, Agus Rumatray, Othys Wropen (Yerisiam Tribe); Ayub Kuwoy (Head of LMA, <i>Lembaga Masyarakat Adat/</i> Indigenous Peoples' Council) Yunus Monei (Head of KPMA Waoha); Pieter R Dimara (Acting Head of	<i>Dusun Sagu</i> must become HCV 5 Add <i>Sungai Busuk</i> (Rarantiruma) to HCV 6 Smallholder/ <i>plasma</i> area should not be taken for HCV area Local community should be represented in consultative workshop in Kabupaten/Regency level: 2 people from village government, 2 from tribes. They will be appointed by local community	Revise HCV 5 and HCV 6 identification result. Revise HCV management recommendation. HCV identification result, HCV presence map and HCV management will be provided to each tribe/cooperative and village government to be reviewed prior to consultative workshop in Nabire Regency; any decision might be submitted before or at the workshop. Local community entitled to legal counsel in the negotiation process of HCV management, especially in relation to smallholder. The process of determining HCV management strategy. List of representative names for consultative workshop in Kabupaten.

Date	Name (Organization/Expertise)	Concern and Recommendation	Assessor Response
	Sima Village); Alberth Nanaor (Head of KPMA Sarakwari and Koroba); Melvin Monei (Village Secretary Sima Village); Yakobus; Nihil; Abrar Ramlan		
(Workshop) 30 Aug 17	Irwan Efendi (Natural Resource Conservation Office Nabire Regency), Wilson (KASIH Papua)	The company is advised to implement collaborative management and monitoring with government institutions, communities and other stakeholders in the landscape	Accommodated in the HCV management and monitoring recommendations.
(Workshop) 30 Aug 17	Gunawan Inggeruhi (Yerisiam Tribe)	Important for relevant authorities to enforce the law if there have been infringements and Enfringements must be communicated to relevant authorities.	Accommodated in the HCV management and monitoring recommendations.
(Workshop) 30 Aug 17	Roberthino (WaohaSub-Tribe, Sima), Irwan Efendi (Natural Resource Conservation Office Nabire Regency), Marry H Lidani (Marine and Fisheries Office)	Important to not only do management of terrestrial HCVs but also marine HCVs (Teluk Cendrawasih National Park).	The boundary of the assessment landscape is terrestrial based, however, if there is direct impact on the marine environment (marine and HCV within them) these threats (and monitoring of HCVs) should be managed by the company.
(Workshop) 30 Aug 17	Roberthino (Waoha Sub-Tribe, Sima), Ayub Kowoy (Nabire Indigenous Peoples' Council)	What is the basis of riparian river buffers when defining HCV management areas.	Assessor will follow Keppres No. 32 / 1990, PP No.26/2008, PP No.38/2011 regulations but also adopt RSPO Riparian management and monitoring. Also, the riparian condition, activities within it had potential threats will be taken into consideration.
(Workshop) 30 Aug 17	Sopater Samanui (Public Works and Spatial Planning Office), Tauhid (Environmental Agency), Sumin Kaimudin (Staffs Yaro District)	Mining of sand and gold, as well as large scale and small scale logging in upstream areas can cause flooding reduces water quality, and sedimentation. Communities are heavily impacted by this.	This is clearly an external threat to HCV 4. Recommendations to encourage village regulation for sand and gold mining that operate around the village.
(Workshop) 30 Aug 17	Hengky (Sima community member)	Fire is traditional used by communities to open up land during the dry season which increases the	Based on hotspot data (2012-2016), most fires were in the vicinity of villages. There is potential for threats to HCV areas

Date	Name (Organization/Expertise)	Concern and Recommendation	Assessor Response
		threat of forest fires.	that are close to these village areas.
(Workshop) 30 Aug 17	Wilson (KASIH Papua), Hengky (Sima community member)	he concept of conservation needs to be given to local communities. Need for Media and information about HCV and management of HCVs and the HCV areas should be available in the villages.	Awareness and education has been incorporated into the recommendations.
(Workshop) 30 Aug 17	Klemens Danomira (Environmental Agency Nabire Regency)	HCV 5 will reduce the area of plasma. If this has been agreed by communities there is no problem but if this has not been agreed upon this could lead to social jealousy	In general during consultation at the village level, areas of sago were identified as HCV 5. Each cooperative will discuss further but up until the post assessment workshop, no results had been received. The maps shown at the workshop were draft versions and could be different to those in the final report.
Workshop (31 Aug 17)	Gunawan Inggeruhi (Yerisiam Tribe)	Sago swamp will be discussed internally first in the community. I do not agree with Pak Ayub that community is at fault. However, from the beginning, local community never been invited/involved. Hope that this will change in the future.	Recommendation will still mention the implementation of FPIC principles in HCV management. All truthful/accurate information, including risks/consequences, should be discussed with local community.
Workshop (31 Aug 17)	Roberthino (Waoha Sub-tribe - Sima)	During 2016 an areas of sago was cleared in PT SAP by Akaba Cooperative, and a complaint was sent to Yayasan Pusaka.	Important to note that there is a testimony concerning this. This areas was not identified during the HCV assessment of 2011 or 2014.
Workshop (31 Aug 17)	Ayub Kowoy (Nabire Indigenous Peoples' Council)	Related to sago and swamp, past stakeholder never know that the area has the potential as HCV area. Government also followed pre-existing rules. After enlightened and come to realization that everybody is at fault, it is beneficial if we stop the blame game, and make some improvement	Assessor will wait for the response or decision from right holders of <i>Dusun Sagu</i> area.
Workshop (31 Aug 17)	Marry H Lidan (Marine and Fisheries Office)	How company treat waste?	Company is responsible to treat waste. Waste management is part of HCV management framework and part of company

Date	Name (Organization/Expertise)	Concern and Recommendation	Assessor Response
			responsibility for non-HCV environmental management
Workshop (31 Aug 17)	Roberthino (Waoha Sub-Tribe - Sima)	<i>Dusun Sagu</i> and other important area (<i>ruija</i>) have been agreed to be kept intact. However if smallholder area is overlap with other HCV, sub-tribes will internally discuss the situation before deciding anything.	Until the end of report preparation process, assessor never receive indication/specific direction of location/polygon which will be retained as smallholders plantation from sub-tribes/cooperatives.
Workshop (31 Aug 17)	Kipli Anak Ayom (General Manager NB/SAP)	The company has renewed its sustainability policy (NDPE 2017). Of the 3 parts to this policy, 2 refer to the environment and demonstrates our commitment for not clearing peat land areas, high carbon stock forests and HCV 1-6 areas. If there is any sago, this area will not be cleared. All national regulations will be followed including the distribution of 80/20 company / smallholder areas. The consequences of this commitment are that the company plantation has been reduced to 51%. The company will hand these areas over to the community because they cannot be planted and many NGOs are monitoring the situation.	The company has a policy of no-deforestation and no development on peat. That are inline with the principles and criteria of RSPO. The areas of peat and forest (as well as other HCV) are identified in this assessment.
Workshop (31 Aug 17)	Aswadi Hamid (National Park Management Division, Region I Nabire), Hengky (Sima Community Member)	Sago is important for Papuan's identity and essential for traditional ceremonies. All FGD groups agrees that Sago was a cultural important value that must be conserved = HCV 6.	Sago groves are identified as HCV 6. as well as HCV 5. Therefore, the management of sago groves that are overlapping with planned <i>plasma</i> areas should be decided by communities themselves – stay as HCV (no-go areas) or removed.
Workshop (31 Aug 17)	Aswadi Hamid (National Park Management Division, Region I Nabire), Hengky (Sima Community Member), Yunus Monei (KPMA Waoha Tribe)	Birds of Paradise are used by Papuan communities as “natural signs” and there are still areas within PT SAP where these birds can be found. They should be considered HCV 6	Even though birds of Paradise have defined as HCV 1 they are also included as HCV 6 here.
Workshop (31 Aug 17)	All participants of HCV 6 discussion group	Since the company has been operating, no destruction of cultural	No areas thus far impacted by company operations, but the

Date	Name (Organization/Expertise)	Concern and Recommendation	Assessor Response
		sites of artifacts has occurred	Sago groves require clarification
Statement Letter (8 Sep 17)	Tribal Plantation Cooperative (Koperasi Perkebunan Masyarakat Adat, KPMA) – represent Akaba Tribe, Sima Village	<ul style="list-style-type: none"> Community have agreed to open up all areas of plasma (smallholder) in accordance to the HGU issued. Understand that a part of the Plasma area has been identified as HCV areas but still request that the area be cleared for oil palm. Request for the HCV areas to be excluded from the plasma areas 	<ul style="list-style-type: none"> The assessors have already disseminated the results of the HCV identification, HCV Areas, threats and recommendation for management and monitoring including the maps for HCV The assessor underscore that there are HCV areas within the planned plasma areas that have HGU issued for Cooperatives from Sima Village, and acknowledge villagers objection/concern that HCV area will reduce smallholder areas.
Statement Letter (8 Sep 17)	Indigenous People (KPMA) – represent Sarakwari Koroba Tribe, Sima Village	<ul style="list-style-type: none"> Community agrees to open and clear all areas of the HGU issued for plasma without reducing area. Informing the request that a proportion of the plasma area even though covered by HCV areas should be cleared and planted. Request these HCV management areas to be removed from the plasma areas 	<ul style="list-style-type: none"> PT SAP needs to abide by the Goodhope sustainability policy and RSPO Principles and Criteria for management of HCV 1-4, and communicate this clearly to the sub-groups within the community that own Cooperatives
Statement Letter (7 Sep 17)	Indigenous People (KPMA) – represent Waoha Tribe, Sima Village	<ul style="list-style-type: none"> Community agrees to open and clear all areas of the HGU issued for plasma without reducing area. Informing the request that a proportion of the plasma area even though covered by HCV areas should be cleared and planted. Request these HCV management areas to be removed from the plasma areas 	<ul style="list-style-type: none"> Assessor maintains HCV 1-4 Management area that overlaps with smallholder area.
Interview (16 Okt 17)	Enrico Kondologit (Anthropologist, Curator at Loka Budaya Museum – Cendrawasih University)	<ul style="list-style-type: none"> Land in Nabire Regency belongs to tribes. Each tribe firmly uphold customary provision, especially in relation to land. Land is perceived as mother who gives them food and life 	<ul style="list-style-type: none"> Further discussion in sub-chapter on the description of wider landscape (Social Cultural values). Discussion in sub-chapter on HCV identification results.
Interview (17 Okt 17)	Habel Samakori (Anthropologist, Research Coordinator (Seven Customary Territory in Papua and Papua Barat)	<ul style="list-style-type: none"> Papua communities do not recognize the concept of land “buying and selling”, but “borrowing” under customary mechanism until the end of the project (either investor project or government project). After a project ends and the land is no longer in use, the land will be automatically returned to the tribe(s). 	
Interview (18 Okt 17)	Windy Hapsari, Hari Suroso (Anthropologist, Researcher at Papua Archaeological Agency)		

Date	Name (Organization/Expertise)	Concern and Recommendation	Assessor Response
		<ul style="list-style-type: none"> - <i>Dusun Sagu</i> is perceived as the mother of Yerisiam community – in their tradition, an area to be protected and restored. - The furthest reaches of Yerisiam territory are Aya Are River estuary (east), Wasoi River estuary (west), east of Ororodo Village, along the ridge to Erega Village in the east of Yamur Lake (north, coastline) - From 11 cultural heritage objects from Papua that currently awaits verification (to be classified as National Cultural Heritage), none are from Nabire Regency 	

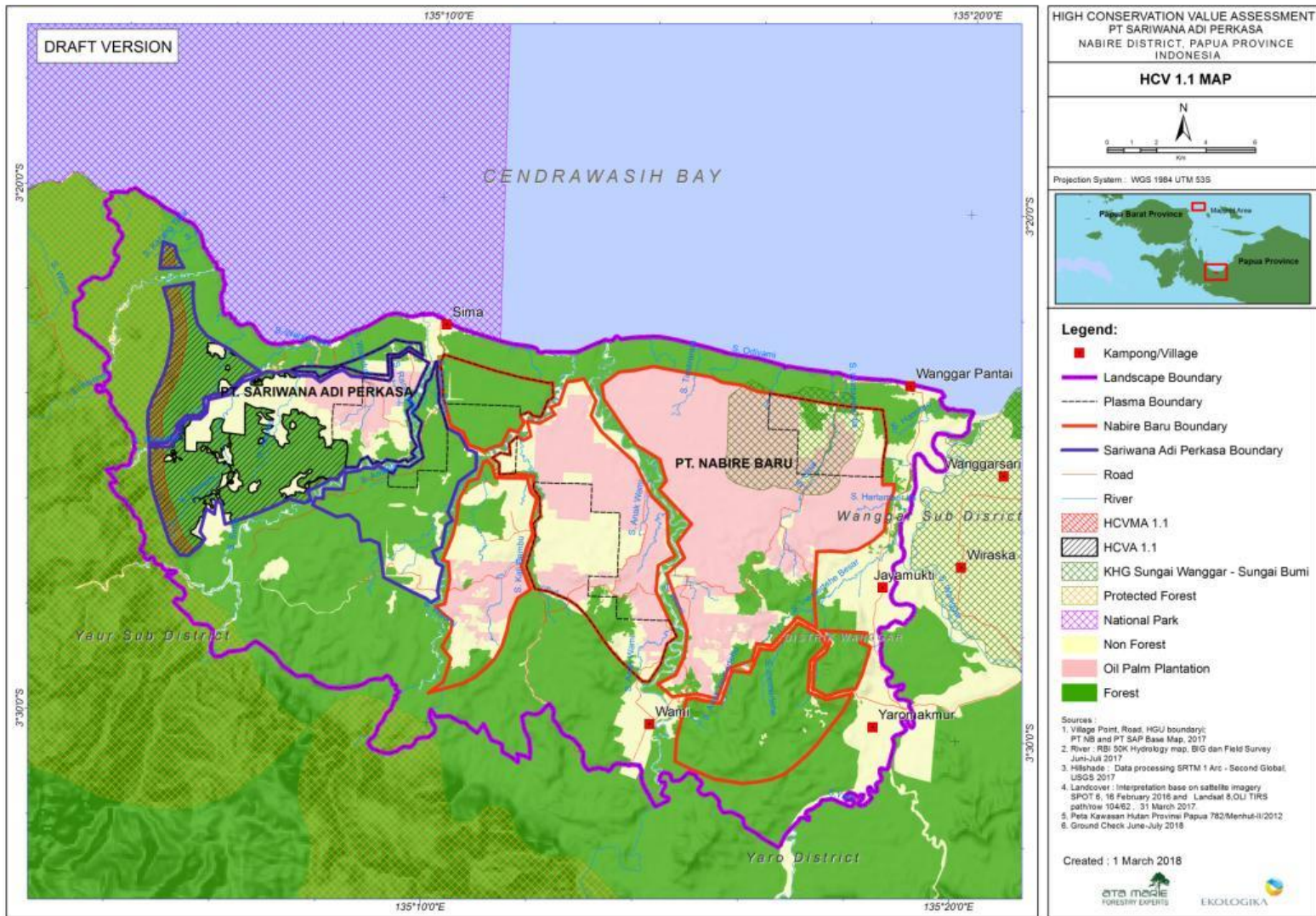


Figure 12. Map of HCVA and HCVMA 1.1 in SAP Assessment area and its Surrounding

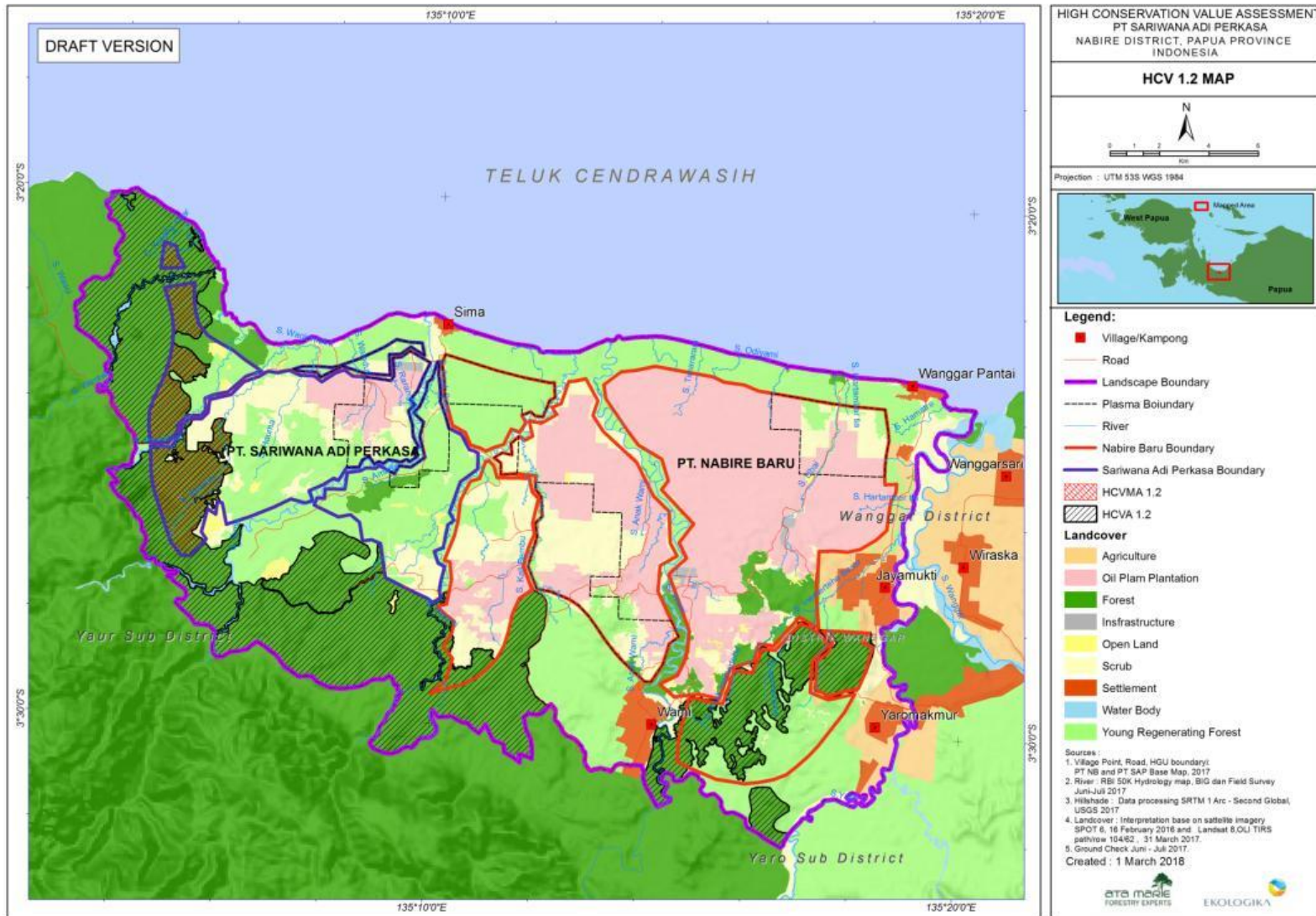


Figure 13. Map of HCV and HCVMA 1.2 in SAP Assessment area and its Surrounding

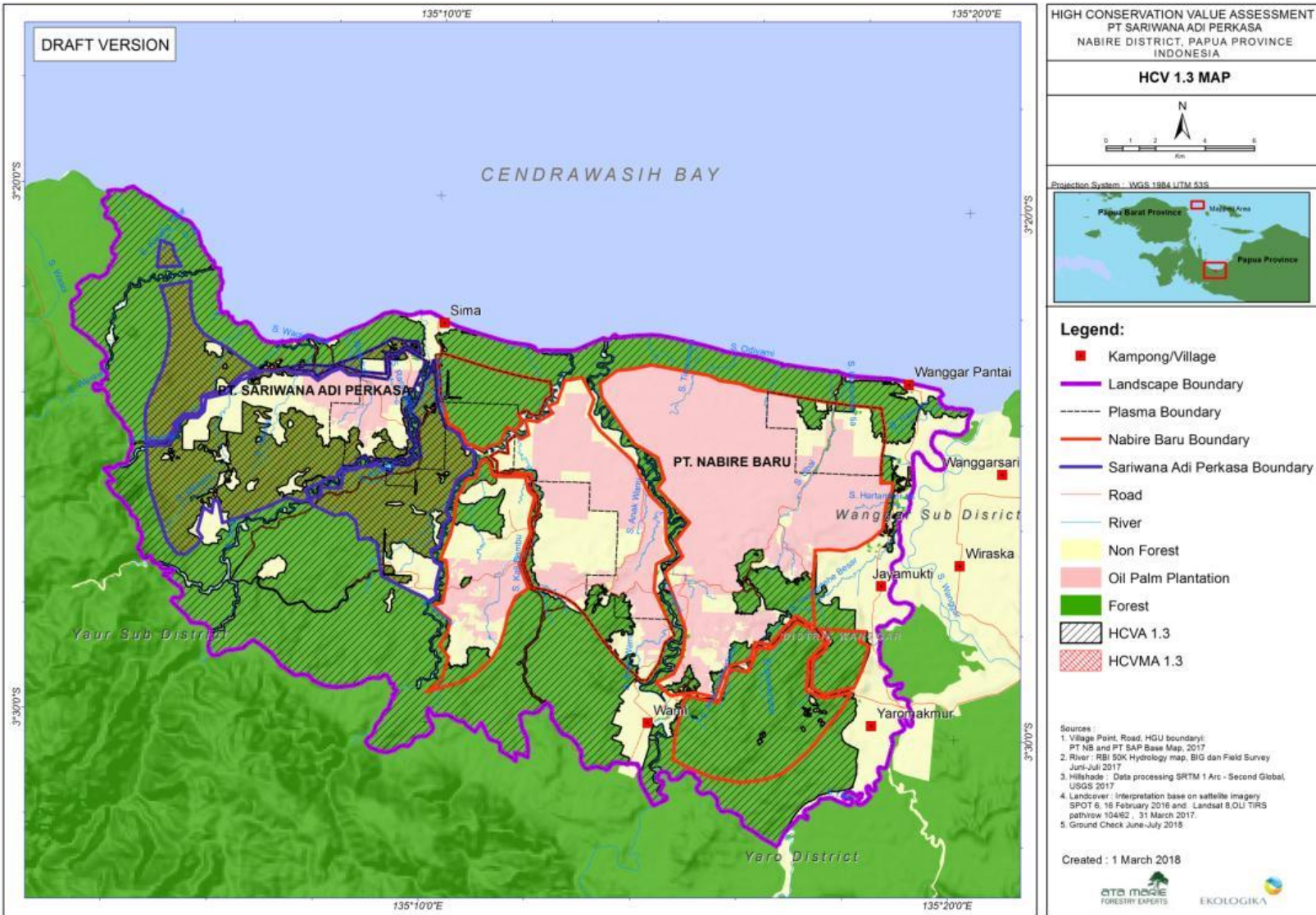


Figure 14. Map of HCV and HCVMA 1.3 in SAP Assessment area and its Surrounding

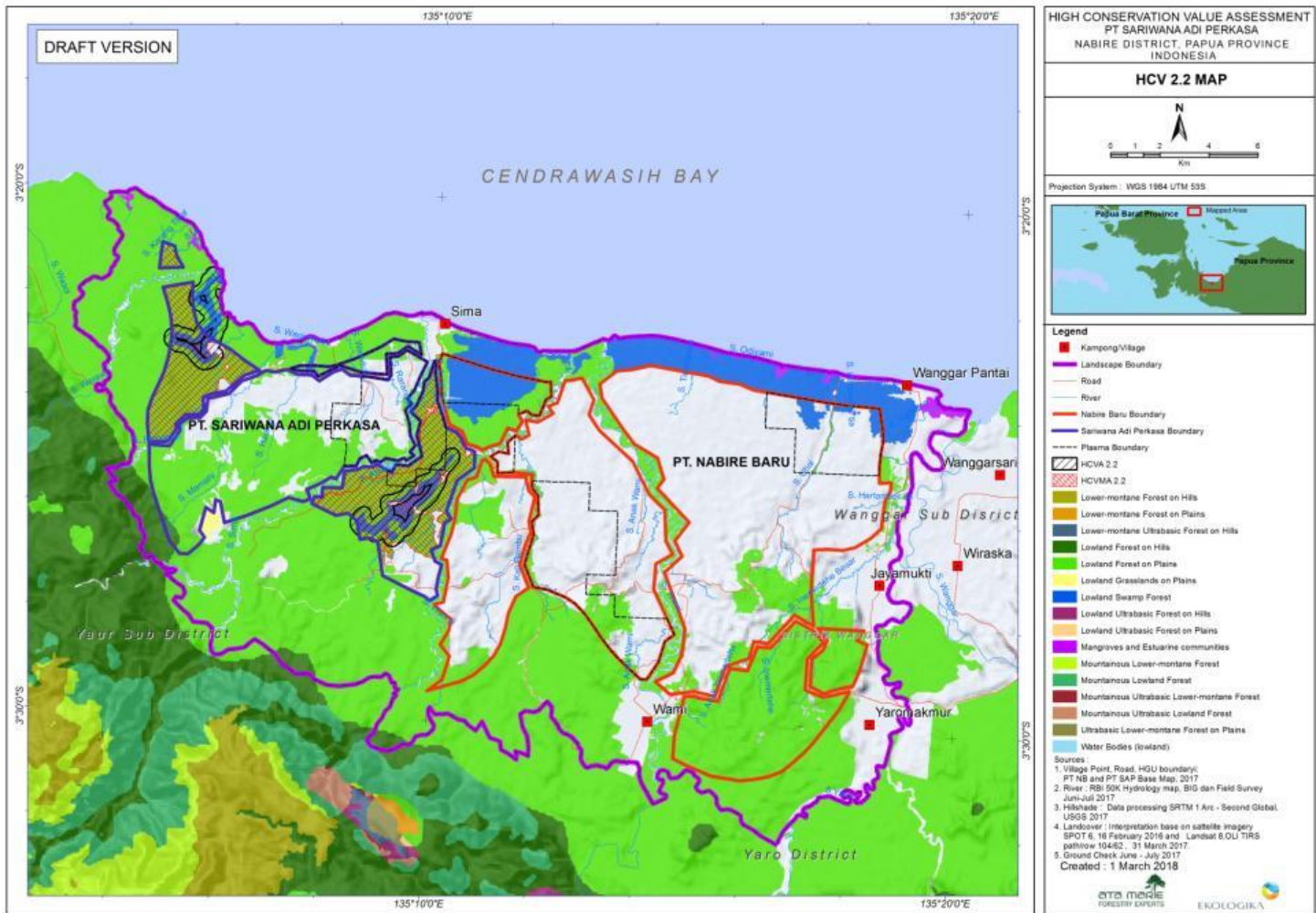


Figure 15. Map of HCV and HCVMA 2.2 in SAP Assessment area and its Surrounding

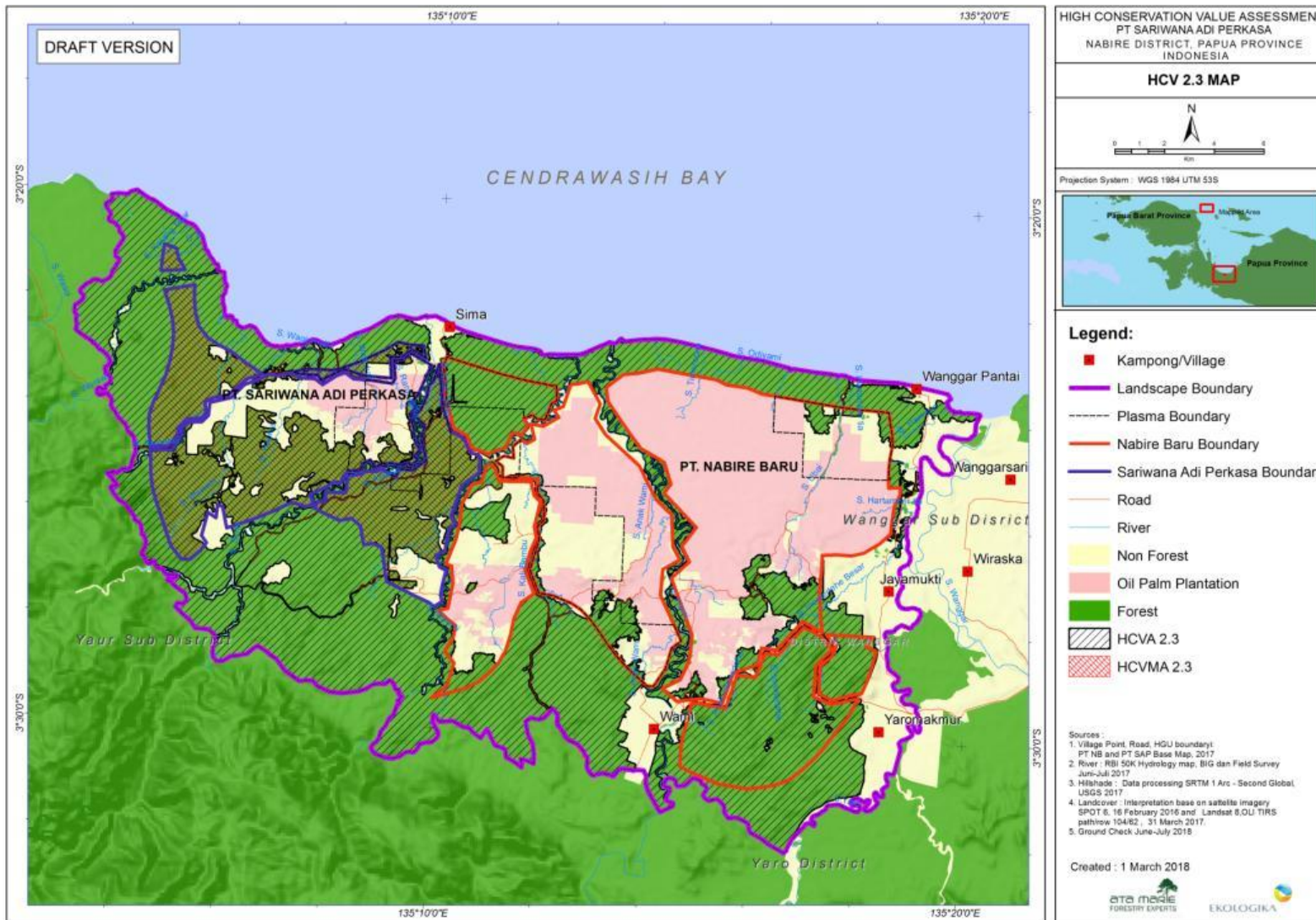


Figure 16. Map of HCV and HCVMA 2.3 in SAP Assessment area and its Surrounding

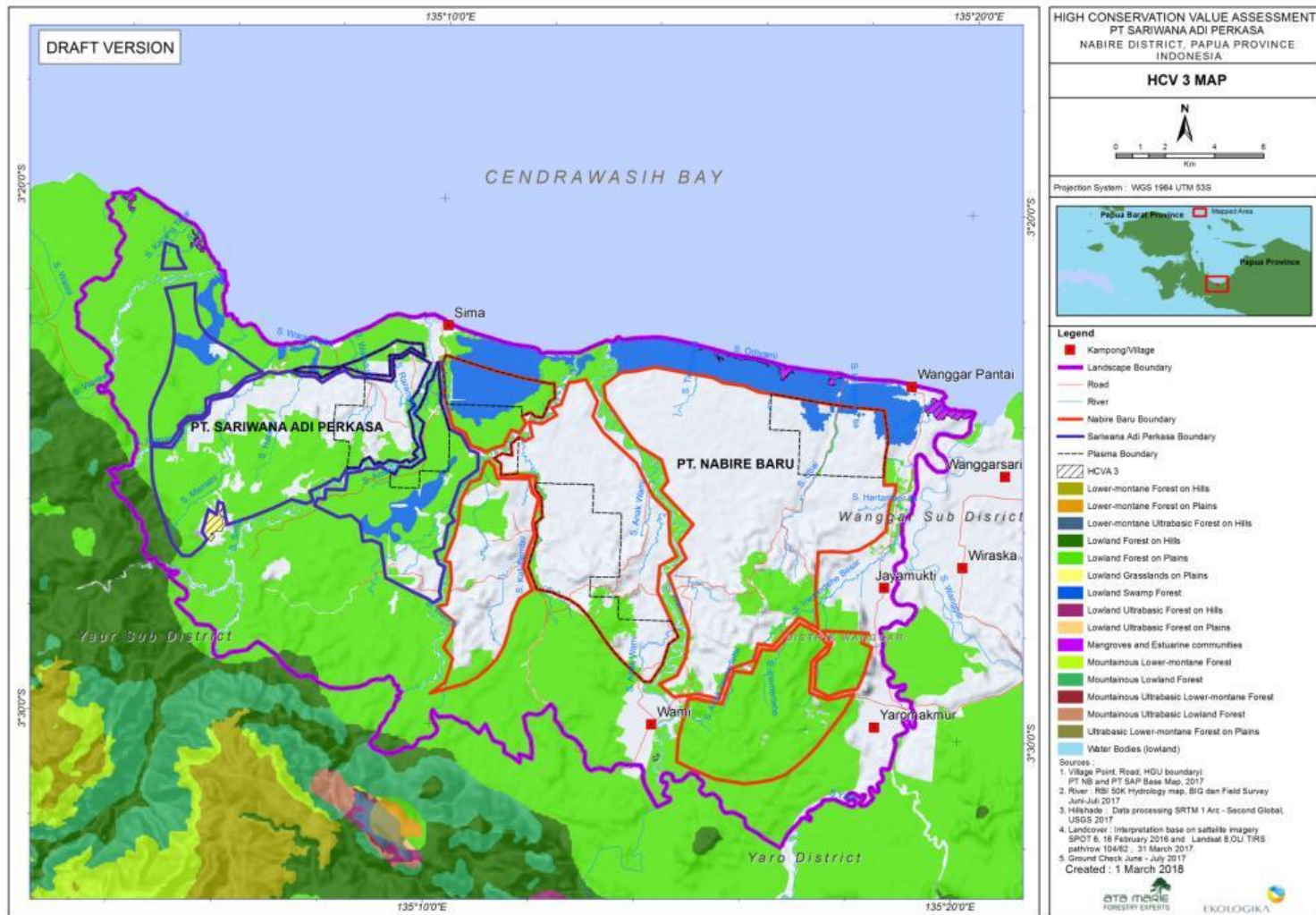


Figure 17. Map of HCVA and HCVMA 3 in SAP Assessment area and its Surrounding

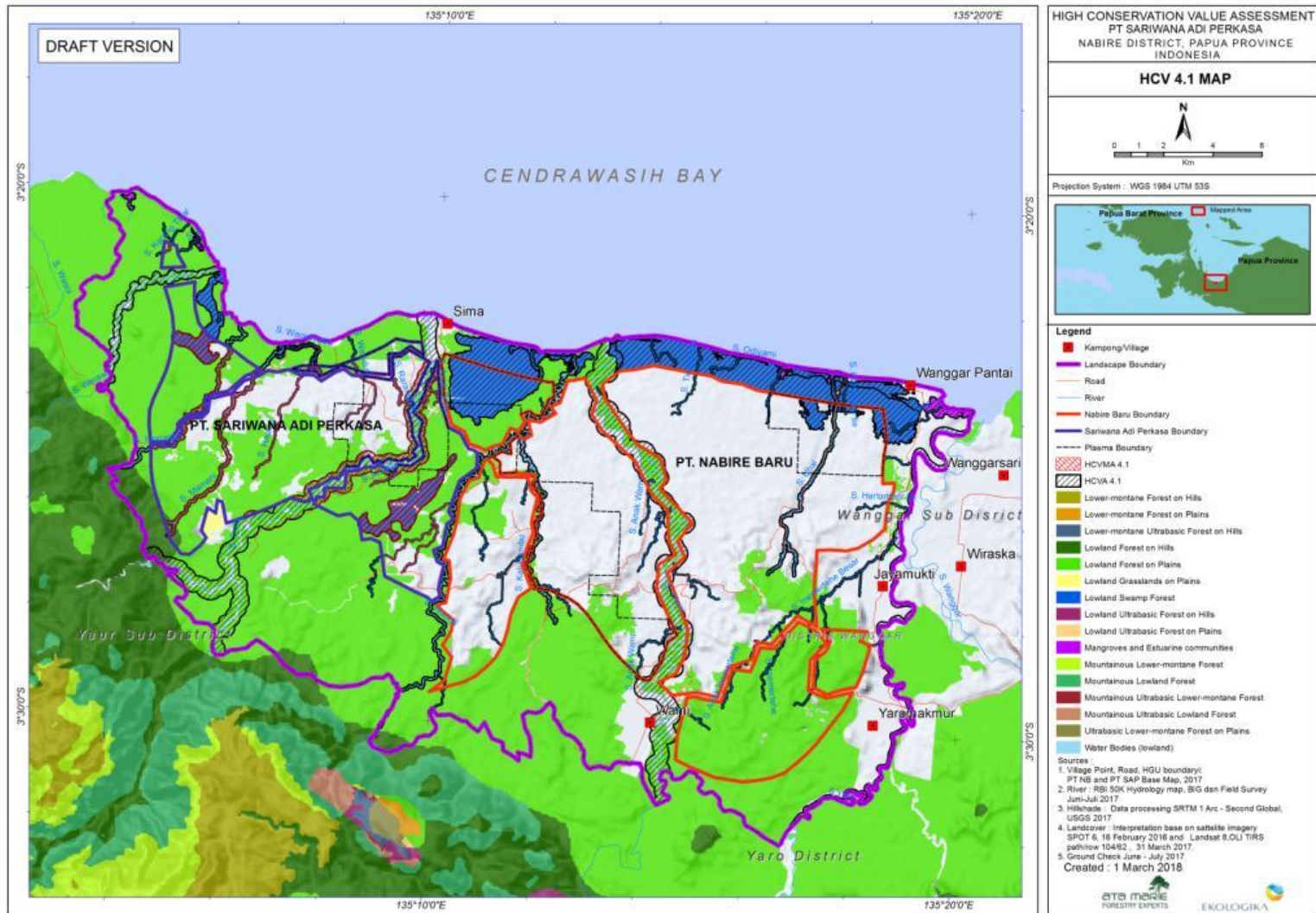


Figure 18. Map of HCVMA 4.1 in SAP Assessment area and its Surrounding

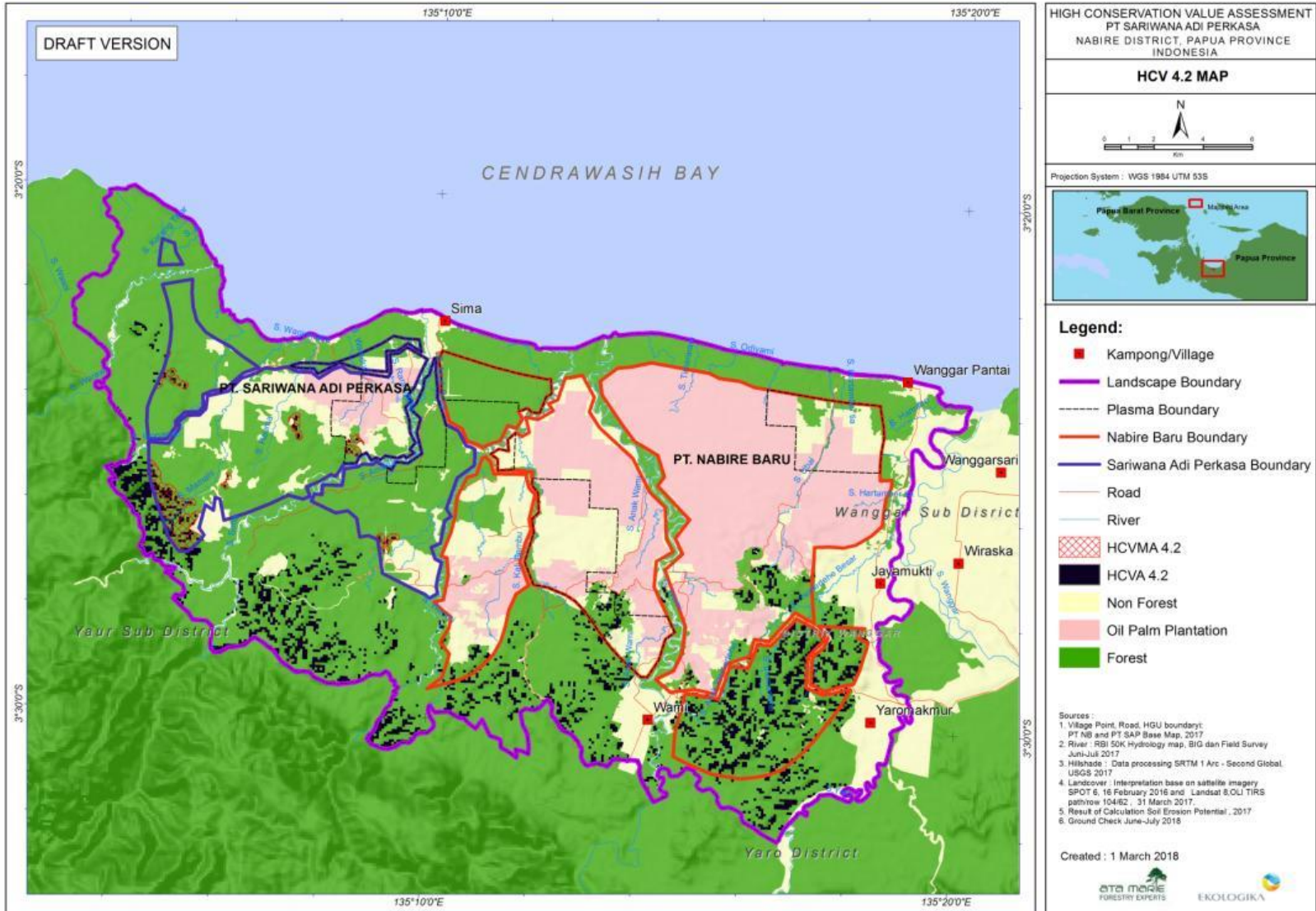


Figure 19. Map of HCVA and HCVMA 4.2 in SAP Assessment area and its Surrounding

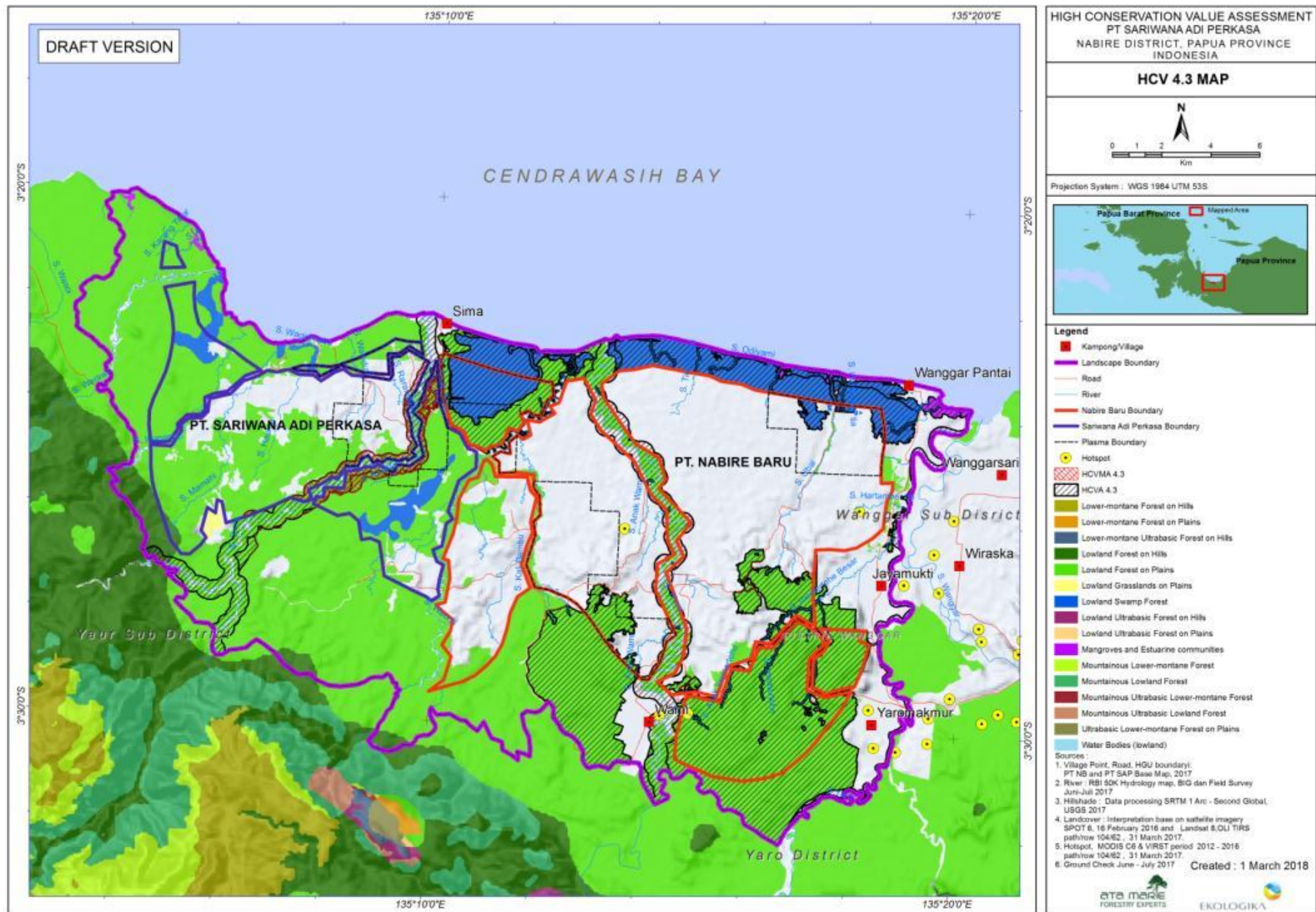


Figure 20. Map of HCVA and HCVMA 4.3 in SAP Assessment area and its Surrounding

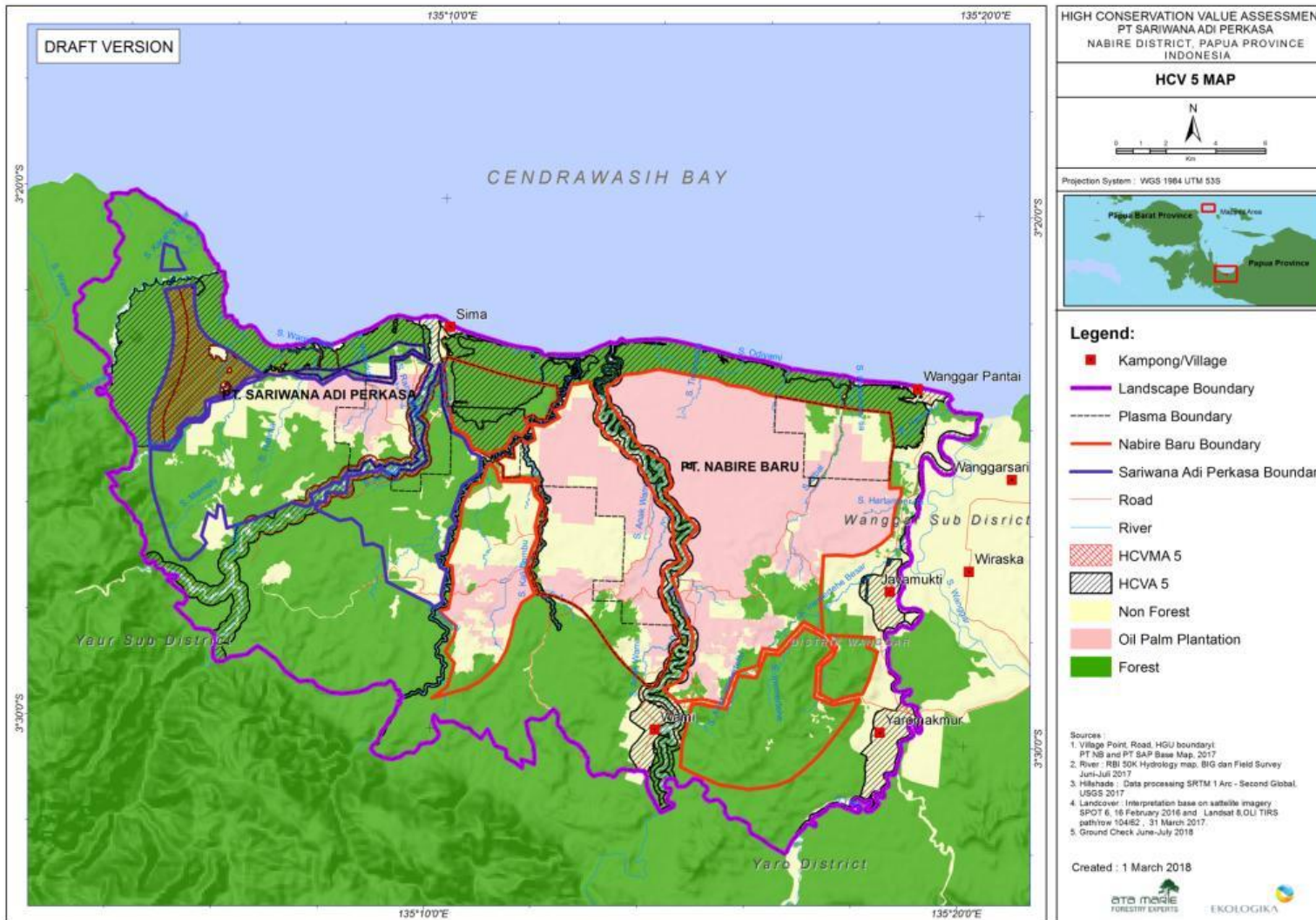


Figure 21. Map of HCVA and HCVMA 5 in SAP Assessment area and its Surrounding

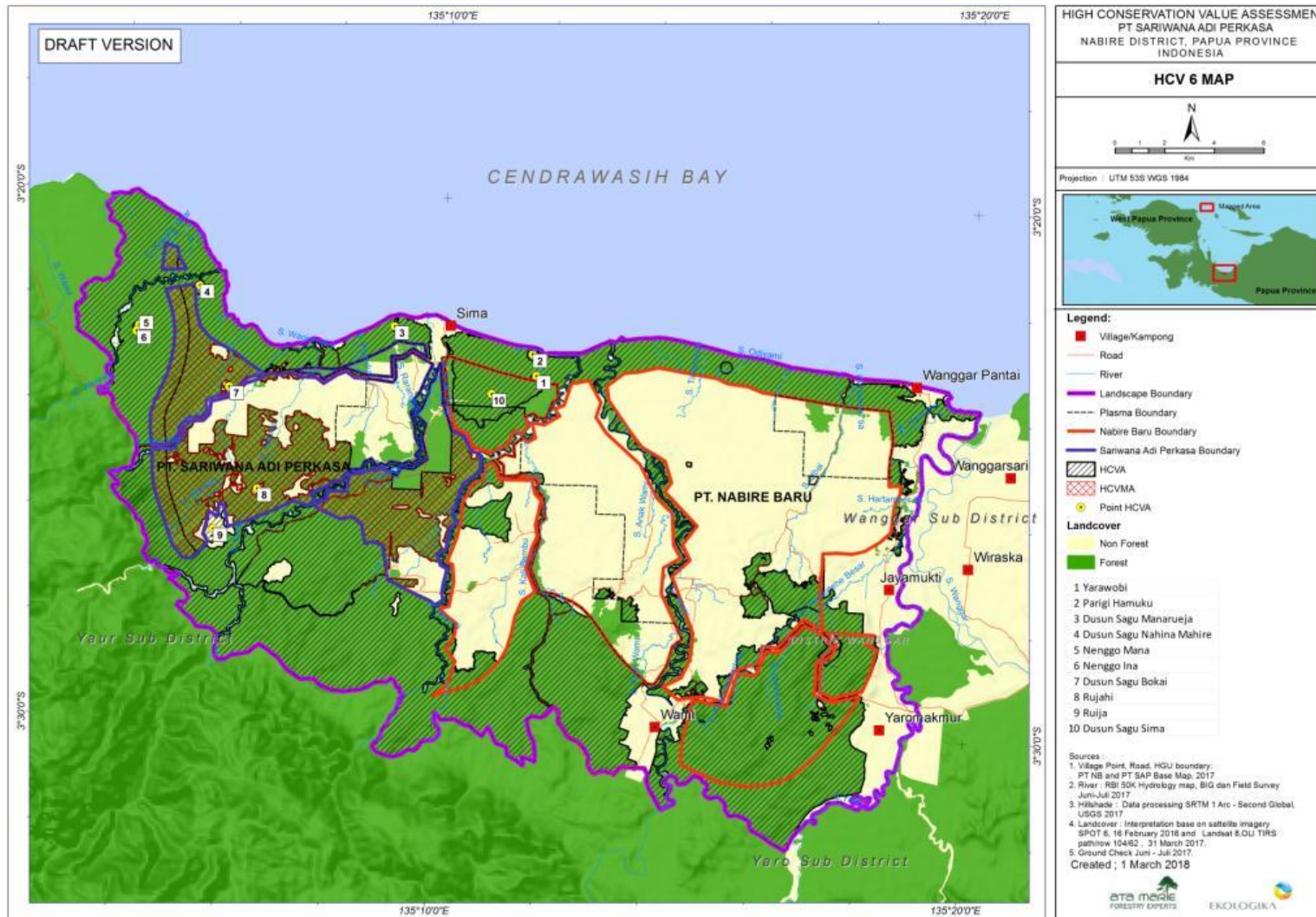


Figure 22. Map of HCVA and HCVMA 6 in SAP Assessment area and its Surrounding

Table 29. Summary of HCVA in PT SAP Assessment Area

HCV	Description	HCVA (ha)		
		Total HCVA in assessment landscape	Total HCVA in Core HGU	Total HCVA in Plasma HGU
1.1	Forest (Lowland Forest Ecosystem)	2.694	2.169	0
1.2	Forest (Lowland Forest Ecosystem)	10.233	815	0
1.3	Forest (Lowland Forest Ecosystem, Swamp Forest, Mangrove and Estuarine)	22.963	3.252	611
2.2	Ecotone (Swamp Forest and Lowland Forest Ecosystem)	833	543	21
2.3	Forest (Lowland Forest Ecosystem)	22.963	3.252	611
3	Grassland in Plains Ecosystem	52	0	0
	Mountainous Lowland Forest Ecosystem	3	0	0
	Mangrove and Estuarine Ecosystem	144	0	0
	Waterbodies/Lake	3	0	0
4.1	Forest	2.496	301	7
	Riverbanks	4.121	293	231
4.2	Soil Erosion Potential (TBE) > 180 ton/ha/year	2.157	46	5
4.3	Forest (Swamp Forest and Lowland Forest Ecosystem)	10.612	151	202
5	Forest, River and Dusun Sagu	8.992	705	197
6	Bird of Paradise	21.437	3.235	
	Sagu (<i>Metroxylon sagu</i>)			
	Dusun Sagu Bokai	8	8	
	Dusun Sagu Kampung Sima	446		
	Dusun Sagu Manarueja	5		
	Dusun Sagu Nahina Mahire	13	1	
	Dusun Sagu Yarawobi	9		
	Goa Nenggoina	1		
	Goa Nenggomana	13		
	Sacred Springs Kampung Sima (Parigi Hamuku) and old sites of Kampung Hamuku	13		
	Ruija Sacred Site	52		
	Rujahi Sacred Site	14	14	

3.4. Soil and Topography

3.4.1. Topography

Based on Topography Map areal of PT SAP almost the whole of the study area consists of level to gently undulating to rolling, hilly, somewhat steep and steep land (0-50%+ or 0-25°+ slopes). Landscape of PT SAP concession is less than 317 metres above sea level. Based on the slope map of PT SAP, the area of assessment flat to very steep, but most of the area (81,6%) of the landscape is flat(0-8%), and the others are: 14,31% Slope Class 8 – 15% (Rolling); 3,97% Slope Class 16-25% (Hilly); 0,57% Slope Class 26 – 40% (Steep); and 0,09% >40 (Very Steep).

Table 30. Slope Classes in This Report

Slope Classes		Description
(%)	(°)	
0–4	0-2	Level
4–12	2-6	Undulating
12–24	6-12	Rolling
24–38	12-20	Hilly
38–50	20-25	Somewhat Steep
50–60	25-30	Steep

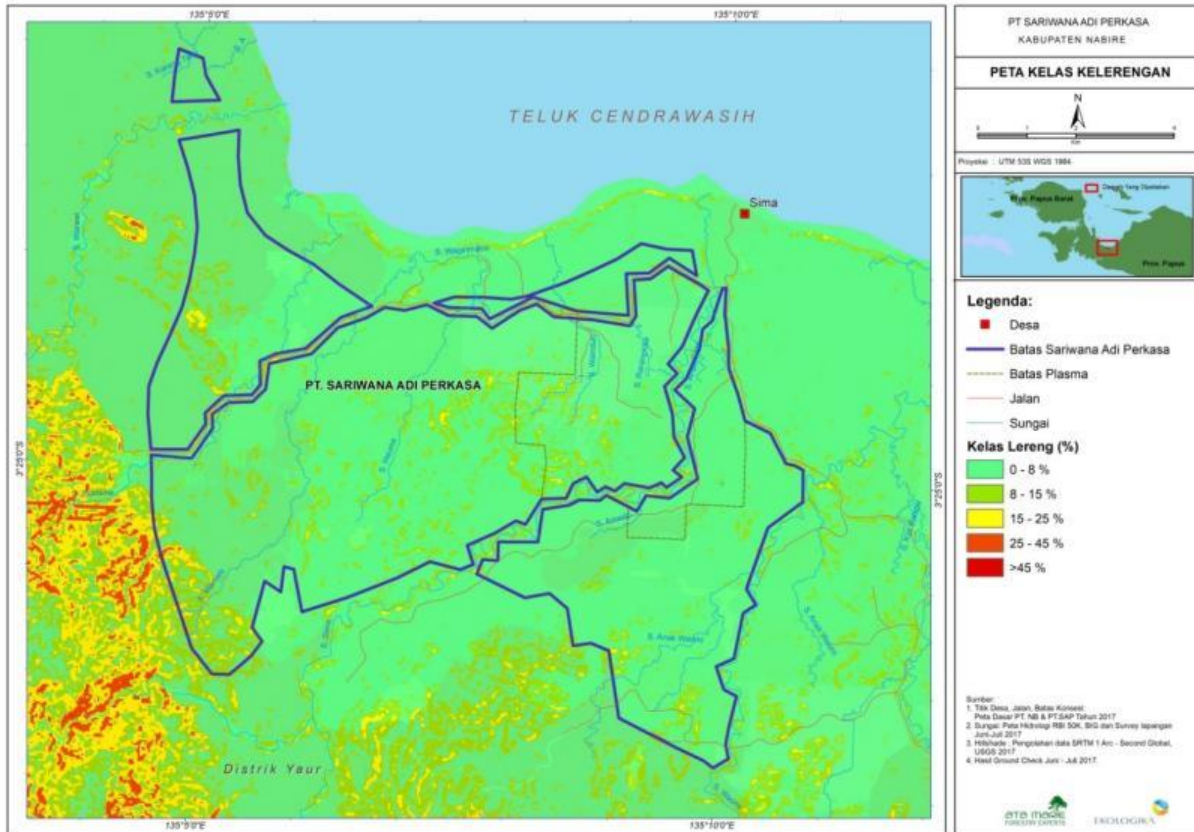


Figure 23. Topographic Map in PT SAP

3.4.2. Soil Type and Peat Land Identification

Based on the results of Soil studies conducted by companies (March 2017) and summarized in USDA Classification Land Classification; the soils in this area consist of ultisols, entisols, histosols and inceptisols. The dominant type of soil is ultisol with alluvium parent rock. This soil type is quite acidic, generally has a pH (4.2-4.8), red and yellow from the accumulation of iron oxide (carat) which is not very soluble in water. This type of soil has many nutrients such as calcium and potassium deficiency resulting in ultisol area cannot be used for permanent agriculture without the help of lime and other fertilizers such as superphosphates.

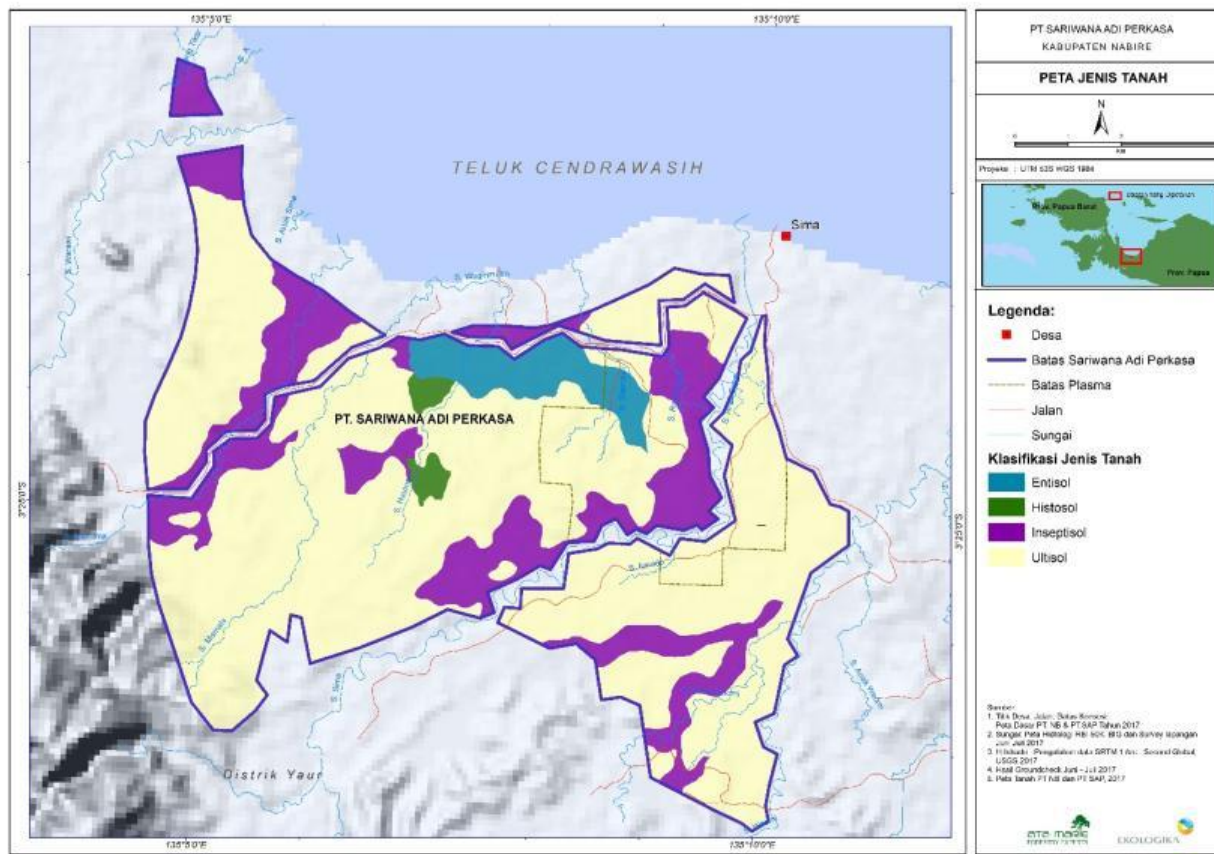


Figure 24. Soil map in PT SAP

The report “Soils of the PT Sariwana Adi Perkasa Estate” (March 2017) included ‘soil suitability evaluation for palm oil cultivation’ and states that based on soil map and evaluation of the area, almost the whole of the study area is potentially suitable for oil palm cultivation with the exception of steep slope. The results of the soil survey identified 8 ‘soil management groups’ in PT Sariwana Adi Perkasa HGU (7 mineral soil groups and one organic soil group). The report included best management practices recommended for each ‘soil management group’. The assessor acknowledged that these recommended practices are already being carried out but these can be further fine-tuned and monitored regularly.

The soil report identified organic soils of the following depths:

- 50-100 cm: 189.0 ha
- 100-150 cm: 212.6 ha
- 150-300 cm: 190.3 ha

Further sampling and analyses were completed in August 2017 by a second consultancy team as part of new HCV assessments. The results of the sampling identified sporadic areas of shallow peatland. There are no peat domes in the area. In total an estimated 31 Ha of peatland has been identified within PT Sariwana Adi Perkasa concessions, located in an area that have been delineated as peatland areas.

Table 31. Peatland Areas in PT Sariwana Adi Perkasa

Land Cover	Non HCV	HCV	Total
YRF	-	8.00	8.00
Scrub	23.00	-	23.00
Palm Oil Plantation	-	-	0
Open Land	-	-	0
Sub Total	23.00	8.00	31.00

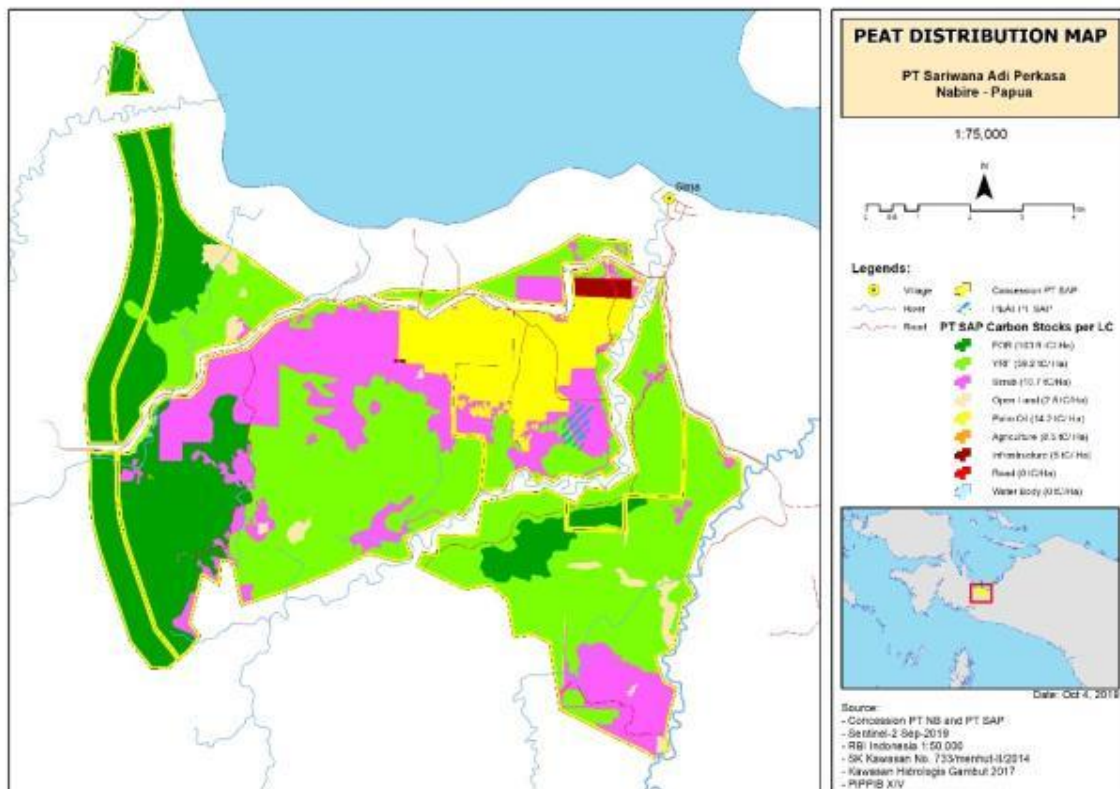


Figure 25. PT Sariwana Adi Perkasa Indicative Peat Distribution Map

3.5. Assessment of Carbon Stock and GHG Emissions

The GHG Assessment of PT NB and SAP states the estimated carbon stocks in the NB and SAP HGU areas, estimates the greenhouse gas emissions that will arise as a result of several scenarios for the development of oil palm plantations, and provides recommendations for low emission development scenarios. The report is intended to meet the standards of the RSPO NPP with the aim of minimizing greenhouse gas emissions.

3.5.1 Carbon Stock

Carbon stock in forest strata is estimated to be 103.9 tons/ha on mineral soils and 105.2 tons / ha on peat soil (Table 32).

Table 32. PT Sariwana Adi Perkasa Carbon Stocks by Land Cover and with extent of HCV and Peat

Land Cover	(Ton C/ ha)	Hectarage			Ton Carbon		
		Non HCV	HCV	Total	Non HCV	HCV	Total
Mineral Soil							
Forest	103.90	-	1,557.70	1,557.70	-	161,845	161,845
YRF	59.20	5.00	2,823.50	2,828.50	296	16,715	17,011
Scrub	10.70	1,175.00	103.40	1,278.40	12,573	1,106	13,679
Agriculture	8.50	1.10	-	1.10	9	-	9
Palm Oil Plantation	14.20	568.50	-	568.50	8,072	-	8,072
Infrastructure	5.00	32.60	-	32.60	163	-	163
Road	-	19.30	-	19.30	-	-	-
Settlement	5.00	0.00	-	0.00	-	-	-
Water Body	-	3.80	-	3.80	-	-	-
Open Land	2.50	57.00	59.00	116.00	143	148	290.00
Sub Total		1,862.30	4,543.60	6,405.90	21,256	179,814	201,069
Peat Soil							
Forest	105.20	-	-	-	-	-	-
YRF	59.90	-	8.00	8.00	-	479	479
Scrub	10.80	23.00	-	23.00	248	-	248
Agriculture	8.50	-	-	-	-	-	-
Palm Oil Plantation	14.20	-	-	-	-	-	-
Infrastructure	5.00	-	-	-	-	-	-
Road	-	-	-	-	-	-	-
Settlement	5.00	-	-	-	-	-	-
Water Body	-	-	-	-	-	-	-
Open Land	2.50	-	-	-	-	-	-
Sub Total		23.00	8.00	31.00	248	479	727
Total		1,885.30	4,551.6	6,437.00	21,504	180,293	201,796

Soil Type	Hectarage	Carbon Stock (tonC)
Mineral Soil	6,405.90	201,069
Peat Soil	31.00	727
Total	6,437.00	201,796

Peat Soil			
Average Peat depth (cm)	Basic Density (gr/cm3)	%C	Carbon Stock/ Ha (tonC/ha)
125,9	0,2	51%	1292

3.5.2. Scenarios Considered

For the purpose of estimating emissions, two scenarios are considered:

- 1) In Scenario A, conservation areas include HCV plus remaining forest land (forest & YRF) and all peatland. i.e. develop all available land except HCV, forest, YRF and peatland which has not been developed.
- 2) Scenario B is designed in accordance with the existing HCS report case where part of the forested land is opened to fulfill the agreed plasma commitments between the company and the community, especially the Sima villagers. i.e. develop as in Scenario A plus forest area (37 ha) and YRF (1,074 ha) which have been identified as HCS solution for Plasma Case Studies.

Scenario A has been selected for proposed new plantings in order to maintain compliance with Goodhope's Sustainability Policy, in particular no development on HCV areas or HCS forest.

Table 33. Scenarios Considered for PT NB dan SAP Development

Scenario	Area for New Development		Area for Conservation
	Area (ha)	Description	
A	3,653	All available land except HCV, forest, YRF and peatland which has not been developed	HCV, forest, YRF and peatland which has not been developed
B	4,765	Same with scenario 3 plus forest area (37 ha) and YRF (1.074 ha) which have been identified as HCS solution for Plasma Case Studies	Same with scenario 3 plus forest area (37 ha) and YRF (1.074 ha) which have been identified as HCS solution for Plasma Case Studies

3.5.3. Emissions from Plantation Operations

Table 34. Projection of Total GHG Emission from New Planting Activities

No	Description	(tCO ₂ e)			tCO ₂ e/ha		
		Scenario			Scenario		
		A	B	All land cleared	A	B	All land cleared
1	Land clearing	5,586	15,480	105,677	1.53	3.25	8.20
2	Crop sequestration	-34,184	-44,582	-120,689	-9.36	-9.36	-9.36
3	Fertilisers	2,620	3,417	9,250	0.72	0.72	0.72
4	N ₂ O	3,489	4,119	12,689	0.96	0.86	0.98
5	Field fuel	830	1,082	2,930	0.23	0.23	0.23
6	Peat	0	0	48,155	0.00	0.00	3.74

7	Conservation credit	-21,783	-19,020	0	-5.97	-3.99	0.00
Total		-43,442	-39,504	58,011	-11.90	-8.30	4.50

Notes: Negative(-) means keep carbon stocks

3.5.4. Emissions from Mill Operations

Below table shows the emission value from Mill operations in each scenario. Assumption of FFB processed by Mill in each scenario includes FFB potential in proposed new planting area and the FFB produced in existing palm oil plantations.

Table 35. Projection of GHG Emissions from Mill Operations

No	Description	(tCO ₂ e)			tCO ₂ e/ha)		
		Scenario			Scenario		
		A	B	All land cleared	A	B	All land cleared
1	POME	61481.80	67577.95	112196.98	16.84	14.19	8.70
2	Mill fuel	5010.46	5507.26	9143.49	1.37	1.16	0.71
3	Purchased electricity	0.00	0.00	0.00	0.00	0.00	0.00
4	Credit (excess electricity exported)	0.00	0.00	0.00	0.00	0.00	0.00
5	Credit (sale of biomass for power)	0.00	0.00	0.00	0.00	0.00	0.00
Total		66492.26	73085.21	121340.47	18.21	15.35	9.41

Notes: Negative(-) means keep carbon stocks

3.5.5. Final Development Map and GHG Emissions Projection Chart

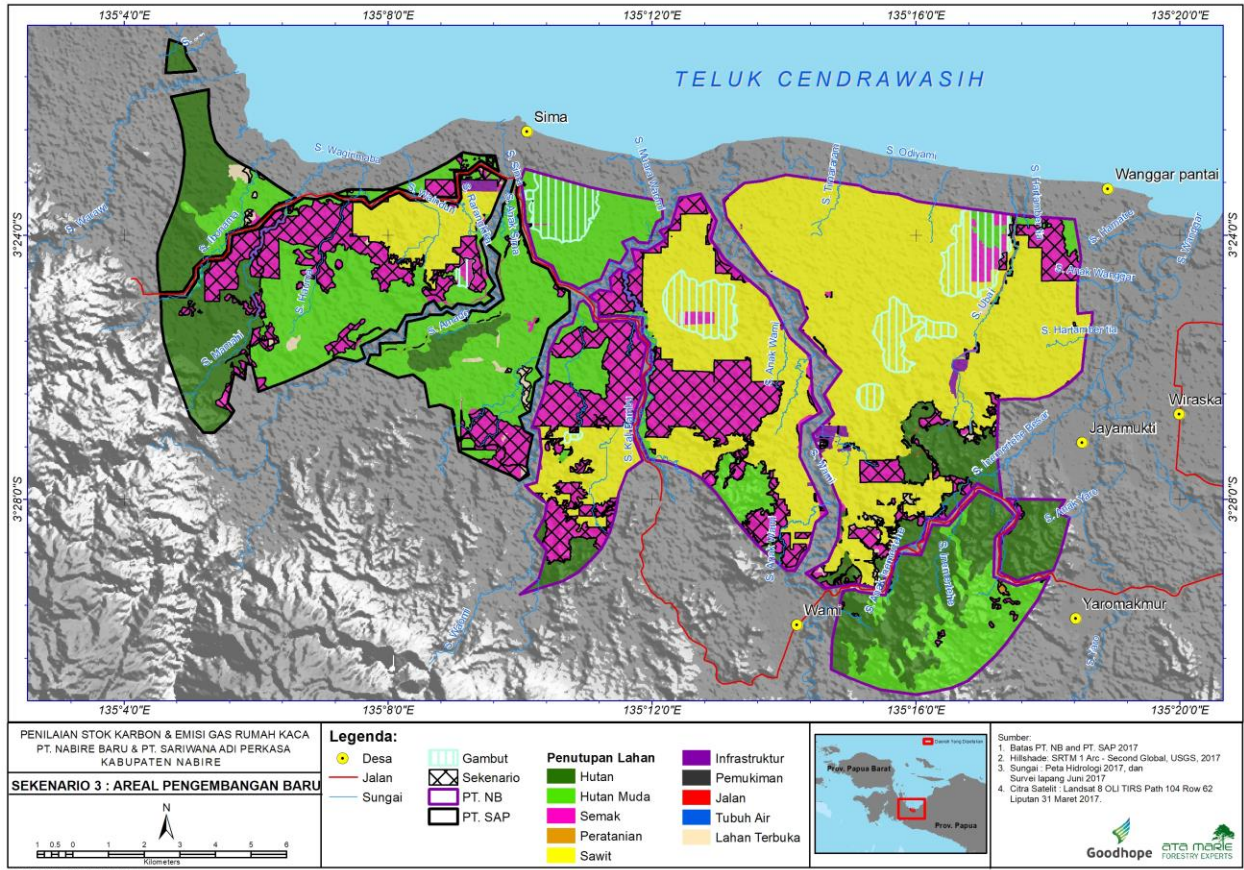


Figure 26. Final Development Map (Scenario A)

Table 36. GHG emissions projection chart

Field emissions & sinks (Assumes vigorous growth for oil palm - for use by large scale operations)			
	t CO ₂ e	t CO ₂ e/ha	t CO ₂ e/t FFB
Land clearing	5.586,01	1,53	0,05
Crop sequestration	-34.183,75	-9,36	-0,33
Fertilisers	2.619,82	0,72	0,03
N2O	3.488,88	0,96	0,03
Field fuel	829,79	0,23	0,01
Peat	0,00	0,00	0,00
Conservation credit	-21.782,64	-5,97	-0,21
Total	-43.441,88	-11,90	-0,42

Mill emissions & credit			
	tCO ₂ e	t CO ₂ e/ha	tCO ₂ e/tFFB
POME	61.481,80	16,84	0,20
Mill fuel	5.010,46	1,37	0,02
Purchased electricity	0,00	0,00	0,00
Credit (excess electricity exported)	0,00	0,00	0,00
Credit (sale of biomass for power)	0,00	0,00	0,00
Total	66.492,26	18,21	0,21

Total emissions, tCO₂e (field and mill)			
	23050,38	6,31	-0,21

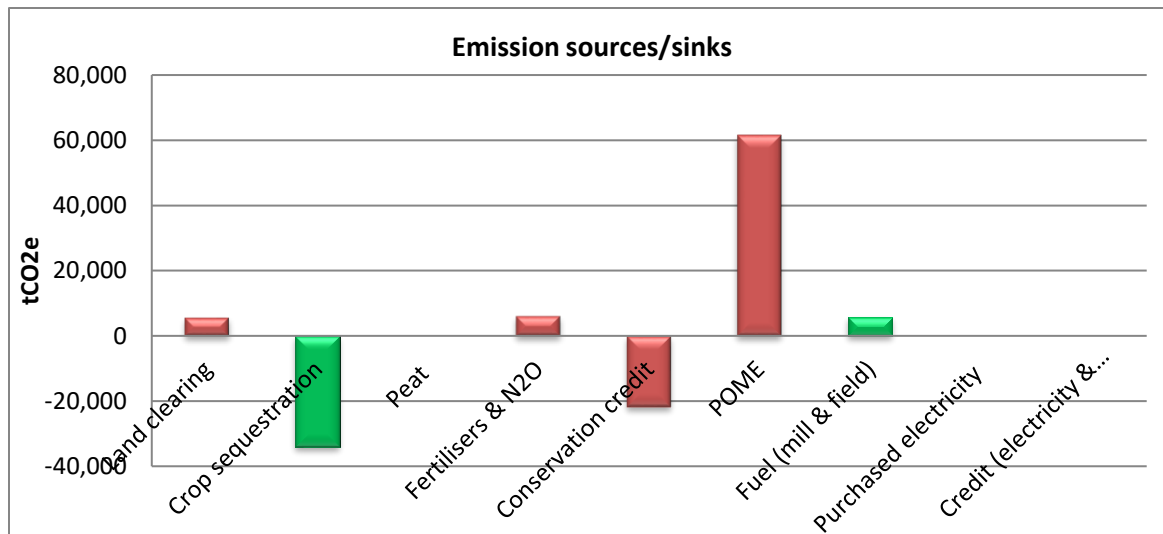


Figure 27. GHG emissions chart – Sources and Sinks

3.6 Community Engagement and FPIC

3.6.1. Community Engagement and FPIC Prior to Development

Prior to release of land, a process of consultation and consent seeking took place:

1. DPRD Nabire members and Customary Land Owner Representatives were invited on site visits to PT Agro Indomas (Goodhope Group mature plantation in Central Kalimantan) in 2009 and 2011.
2. Socialization of the proposed development was done formally in village level, and informally with each of sub tribes, and to other selected target groups. Discussion included opportunities and risk associated with plantation development and the proposed plasma partnership scheme.
3. Participatory mapping/land inventory was carried out with all sub-tribes.
4. Land ownership transfer was carried out through a process of land compensation and compensation for any planted crops.
5. Consent to land release was signed by heads of sub tribes and individual land owners.
6. Price agreement is documented in written agreements.
7. A list of planned compensation payments was placed on announcement boards for the whole community to see and check who was entitled for land compensation and how much.
8. Entitled parties came to claim the land compensation as per agreed and announced.

3.6.2. Community Engagement and FPIC Regarding ICLUP Following New HCV Assessment and HCS Assessment

The key objectives of the community engagement activities were as follows:

- To share information about the HCS and HCV assessment processes with communities.
- To seek community consent and participation for planned HCS and HCV assessment related activities.
- To seek information and knowledge on current and future land use at community level as input into preparation of the HCV, HCS and Integrated Conservation and Land-Use Plan (ICLUP).
- To seek community informed consent to the final draft boundaries of conservation areas.

3.6.2.1. Participatory Mapping

Land use and land tenure systems were analysed during participatory mapping as well as FGDs to meet the objectives of both HCV and HCS Assessments. Objectives include description of land ownership structure, and identification and mapping of community land use and cultural sites (HCV 5 and 6). Mapping was primarily carried out with Wanggar and Sima communities as these are the two land owner villages. A large part of the participatory mapping effort was in identification of sago areas.

3.6.2.2. Summary of Community Engagement Findings Regarding Land Use

The land tenure system at Sima and Wanggar is communal. Land tenure maps developed from participatory surveys during land release negotiations by the Company are available and were vetted by the LINKS team (see the LINKS FPIC Gap Analysis Study in Sharepoint).

The major types of land use identified are sago collection, timber cutting, fishing, hunting and gathering of various other non-timber forest products. Smallholder agriculture activity is very small scale and located outside concession boundaries.

The final “FGD FPIC” were held at each village between 20-25 August between the HCV/HCS teams and Communities. The objective was to present and discuss the findings of the HCV, HCS, and participatory mapping surveys carried out during the initial site visit. Large scale maps of the draft land use plan were displayed, and Community members invited to check and add comments as desired during the discussions. Additional input was also received during the two-day final stakeholder consultation meeting held on 30-31 August in Nabire. There is a clear need to find a solution to the as yet unresolved issue of community requests for continued development of plasma areas.

3.6.2.3. Key points from the FGD FPIC at Village Level

Sima: Community accepted the HCV 1-6 and HCS areas identified during participatory mapping although some small changes were made to HCV 5 (some additional sago patches were identified during the meeting). Key points coming from the meeting:

1. It was agreed that all sago areas will be included in HCV 5 and conserved.
2. Apart from sago areas, communities requested that all plasma areas be developed including forested areas (Note this request does not align with results of HCV 1-4 or HCS assessments).

Wanggar: Community accepted the HCV 1-6 and HCS areas identified during participatory mapping. Key points coming from the meeting:

1. Communities requested that all plasma areas be developed including forested areas (Note again as at Sima, this request does not align with results of HCV 1-4 or HCS assessments)
2. Communities requested any plasma land that needs to be conserved (due to HCV/HCS/peat) should be replaced elsewhere.

3.6.2.4. Key Points from the Final Stakeholder Consultation Meeting

Many community members raised concerns about uncontrolled logging and gold mining impacting on their environment. Although community members admitted they were often employed in these activities, they were not the drivers. Community members frequently mentioned a lack of effective planning, control and monitoring from relevant government agencies, and “co-operation” between local businessmen and individuals in the agencies.

The importance of implementing a participatory approach to environmental management and monitoring was mentioned. Some attendees said many community members do not understand the requirement for environmental management, and also were not aware of the exact location of boundaries (Concession boundaries, plasma area boundaries, conservation area boundaries etc).

Participatory management will both educate as well as enable better implementation of management plans.

3.6.3 Addressing Stakeholder Concerns

Continued efforts have been made to improve levels of mutual understanding and repair relations between the company and local communities. In particular, the company has worked to address main concerns that were raised by Yayasan Pusaka on behalf of the indigenous Yerisiam Gua community. These include the following key issues: i. development without a collective decision-making process or consent given by local communities; ii. land disputes; iii. destruction of Sago groves; iv. violence by state security forces; v. deforestation implicated with flooding.

From March 2017 until July 2018 the resolution process was supported by the Conflict Resolution Unit (CRU) of the IBCSD (Indonesian Business Council For Sustainable Development) under the framework of the RSPO Dispute Settlement Facility (DSF).

In July-August 2018, the Dispute Resolution Agreement was negotiated and agreed by representatives from the company and local communities. The signed agreement was notarized by Nabire Regency government officials on 9th August 2018.

In accordance with the obligations of the Dispute Resolution Agreement (August 2018), negotiations have resulted in the development of a Memorandum of Understanding for community engagement and empowerment. The Memorandum of Understanding: Corporate Social Responsibility (CSR) PT Nabire Baru (NB) was signed by representatives from company and community on 17th January 2019.

4. SUMMARY OF MANAGEMENT PLANS

Goodhope commits to carry out management and monitoring activities in accordance with the Group's Sustainability Policy and RSPO Principles and Criteria.

4.1. Team Responsible for Developing Management Plans

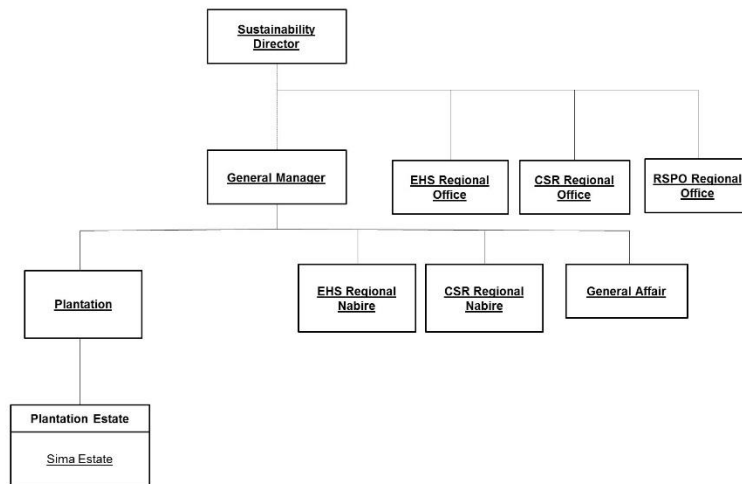


Figure 28. Personnel involved in planning and implementation of New Planting Procedure in PT Sariwana Adi Perkasa

4.2. Stakeholders to be involved

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

The company has been carrying out a public consultation which it held on June 2017, August 2017, and February 2018 involved community, local government who live in the neighborhood concession HGU company. The villages that follow the public consultation that village on and around Yaur District and Yaro District, Nabire Regency, Papua.

Below is The List of participants of stakeholder consultation (Not limited to, but including):

a. Organisation and Local Community Representative/Tribes:

1. Kampung Sima
2. Kampung Wanggar Pantai
3. Desa Wami
4. Desa Jaya Mukti
5. Desa Yaro Makmur

6. Suku Wate Asiaina
7. Suku Besar Yerisiam Goa - Sub Suku Sarakwari, Akaba, Koroba, Waoha

b. Government Organisation:

1. Kecamatan Yaur
2. Kecamatan Yaro
3. Badan Konservasi Sumber Daya Alam Kab. Nabire
4. Badan Lingkungan Hidup Daerah (BLHD) Kab. Nabire
5. Badan Pertanahan Nasional Kab. Nabire
6. Dinas Pertanian Tanaman Pangan dan Peternakan Kab. Nabire
7. Dinas Perkebunan Kab Nabire
8. Dinas Perikanan dan Kelautan Kab. Nabire
9. Bappeda Kab Nabire - Kepala Bidang Data, Penelitian dan Pengembangan, dan Statistik
10. Dinas Pekerjaan Umum Kab. Nabire
11. Badan Pemberdayaan Masyarakat dan Pemerintahan Kampung Kab. Nabire
12. Dinas Koperasi dan UKM Kabupaten Nabire
13. Badan Penanggulangan Bencana Daerah Kabupaten Nabire
14. Taman Nasional Teluk Cendrawasih

c. Non Government Organisation:

1. Keuskupan Timika
2. Klasis GKI Paniai
3. Klasis Gereja Pantekosta
4. Dewan Adat Papua Kabupaten Nabire
5. WALHI Papua
6. KASIH Papua
7. PRIMARY
8. KOMPAK
9. Universitas Satya Wiyata Mandala
10. Yayasan Pusaka

e. Company and Plasma Cooperative (Mitra Koperasi Plasma:

1. PT Jati Dharma Indah
2. KPMA Wate Asiaina
3. KPMA Waoha
4. KPMA Akaba
5. KPMA Sarakwari dan Koroba

4.3. Summary of Social and Environmental Management Plan

4.3.1. General Recommendations

Management of negative impacts is carried out in accordance with the mitigation negative impact hierarchy, namely: (1) Avoid, namely by trying to prevent negative impacts; (2) Reduce, namely by trying to reduce the potential negative impacts that can occur; (3) Repair, which is by trying to correct the negative impact

Recommendations on the management of key issues that can be undertaken by the management unit are as follows:

- Cooperate with local government of Nabire district in an effort to improve the quality of human resources in the local area, especially health and education.
- Cooperate with the local government of Nabire district as well as service providers in basic infrastructure development that can support the lives of affected communities.
- Cooperate with the local government of Nabire district and other related parties in poverty alleviation efforts.
- Cooperate with the local government of Nabire district and also the village government in an effort to strengthen the capacity of the village government apparatus and support the improvement of the quality of the administrative services of the village administration.
- Cooperate with the local government of Nabire district, particularly the Regional Disaster Management Agency (BPBD), and other relevant parties and local communities in disaster risk management efforts in the local area.
- Cooperate with local government of Nabire district, customary institution, and TNI / Polri in law enforcement in local area.
- Encourage the presence of relevant multi-stakeholder forums in local area landscape management.
- Cooperate with local governments of Nabire districts, customary institutions, religious institutions (church clans, MUI, etc.) and other stakeholders for strengthening cultural and religious practices for communities in the local area.
- Cooperate with the local government of Nabire district and other concerned parties to undertake the development and strengthening of the capacity of social organizations such as community business cooperatives, youth organizations, women's organizations and so on.
- Develop feedback and complaints handling mechanisms.
- Facilitate the process of arranging agreements between the management unit and the community
- Develop and implement a participatory monitoring plan with indicators to monitor changes over time. Conduct periodic evaluations and reviews and adaptive management.

Table 37. Recommendation for Negative Impacts Management

No.	Impacts	Activities act as impact source	Impact Management
1	Potential reduced access to the production of customary land such as sago, hunting, timber, rattan, etc.	Land Clearing	Providing support to the community to access production sources in other areas
			Strengthening community knowledge and capacity on replacement nutrition sources such as cultivation / livestock
2	Potential conflicts arise due to differences in the amount of compensation received by each community member / KPMA.	Land Provision	Encourage the application of transparent land sharing compensation mechanisms to KPMA management and tribal and sub-tribal leaders
			Socialization to KPMA members together with KPMA management
3	Increase in the number of disease sufferers caused by mosquitoes as disease vectors	Land Preparation	Conducting disease prevention efforts caused by mosquito vectors
			Conduct monitoring of public health conditions and prepare health care support if needed
4	Potential disruption to the source of clean water	Land clearing	Conducting sustainable water management efforts by involving the community
			Monitoring the community's water supply and preparing clean water support if needed
5	Potential loss of nutrients due to reduced location of hunting	Land clearing	Conducting management of important areas for the community (HCV 5)
			Strengthening community knowledge and capacity on replacement nutrition sources such as cultivation / livestock
6	Potential loss of local food sources due to land clearing activities	Land clearing	Conducting management of important areas for the community (HCV 5)
			Strengthening community knowledge and capacity on replacement food sources such as cultivation
7	Reduced sago reserves belonging to communities due to land clearing errors	Land clearing	Monitoring of land clearing activities in accordance with the planning
			Replacement of damaged sago tree
8	Potential conflicts between the board and members of KPMA as well as between KPMA	Partnership	Strengthening the capacity and knowledge of the board and members of the community about

No.	Impacts	Activities act as impact source	Impact Management
	members (the public) and the company due to the limited understanding of KPMA members to business processes, including operational costs to cooperatives and the distribution of plasma output.		the plantation business process Maximize grievance and conflict resolution mechanisms
9	KPMA management is not working well	Partnership	Capacity building and knowledge of KPMA management on an ongoing basis Monitoring of KPMA management periodically
10	Potential of river water pollution that can decrease the quality of river water and disruption of water biota life due to the use of fertilizers and pesticides	Nurseries	Apply the appropriate pattern of fertilizer and pesticide usage Monitoring the environmental impacts of rivers and other water sources
11	Potential occurrence of landslide disaster due to soil erosion in the process of planting oil palm on hilly areas	Planting	Prevent landslide prevention in hilly areas Perform periodic monitoring of hilly areas especially during the rainy season
12	A potential declining in productivity of oil palm crops due to massive pest attacks due to the planting of homogeneous plant species (palm)	Planting	Perform pest and disease management regularly Conduct regular monitoring of the condition of oil palm trees
13	Potential health problems due to increased dust content due to mobilization of operational vehicle plantations	Planting	Perform periodic road watering Conduct public health monitoring and prepare health care support if needed
14	Potential disruption of community mobility due to road damage due to mobilization of operational vehicle plantations	Planting	Improving the quality of plantation roads so as not to be easily damaged Conduct monitoring of road conditions and repairs in case of damage
15	river water pollution that can decrease the quality of river water and disruption of water biota life due to the use of fertilizers and pesticides	Maintenance	Apply the appropriate pattern of fertilizer and pesticide usage Monitoring the environmental impacts of rivers and other water sources
16	Potential reduced water	Maintenance	Conducting sustainable water

No.	Impacts	Activities act as impact source	Impact Management
	discharge that can disrupt public water supply due to water use		management efforts by involving the community Monitoring the community's water supply and preparing clean water support if needed
17	Potential health problems during maintenance activities due to the use of chemical fertilizers and pesticides	Maintenance	Apply the appropriate pattern of fertilizer and pesticide usage Conduct public health monitoring and prepare health care support if needed
18	Potential Health problems due to increased dust content due to mobilization of operational vehicle plantations	Maintenance	Perform periodic road watering Conduct public health monitoring and prepare health care support if needed
19	Potential disruption of community mobility due to road damage due to vehicle mobilization plantation operations	Maintenance	Improving the quality of plantation roads so as not to be easily damaged Conduct monitoring of road conditions and repairs in case of damage
20	The emergence of potential conflicts between indigenous peoples and migrant workers	Maintenance	Strengthening Capacity and work patterns of the community in order to compete with migrant communities Maximize grievance and conflict resolution mechanisms
21	Potential health problems due to increased dust and noise content due to mobilization of plantation operations	Harvesting	Perform periodic watering of the road Conduct public health monitoring and prepare health care support if needed
22	Potential disruption of community mobility due to road damage due to mobilization of plantation operations	Harvesting	Improving the quality of plantation roads so as not to be easily damaged Conduct monitoring of road conditions and repairs in case of damage
23	The emergence of potential conflicts between indigenous peoples and migrant workers	Development of Palm Oil Mill	Strengthening Capacity and work patterns of the community in order to compete with migrant communities Maximize grievance and conflict resolution mechanisms
24	Potential health problems due to increased dust and noise content due to mobilization of operational vehicle of	Development of Palm Oil Mill	Perform periodic road watering activities Conduct public health monitoring and prepare health care support if

No.	Impacts	Activities act as impact source	Impact Management
	plantation		needed
25	Potential disruption of community mobility due to road damage due to mobilization of plantation operations	Development of Palm Oil Mill	Improving the quality of plantation roads so as not to be easily damaged Conduct monitoring of road conditions and repairs in case of damage
26	Potential health problems arising from air pollution and noise due to the activity of palm oil mill machinery	Development of Palm Oil Mill	Implementation of waste management and factory pollution well Conduct public health monitoring and prepare health care support if needed
27	Potential health problems caused by environmental pollution from oil palm machine activity	Palm Fruits Processing	Implementation of waste management and factory pollution well Conduct public health monitoring and prepare health care support if needed
28	Potential health problems due to increased dust and noise content due to mobilization of plantation operations	Palm Fruits Processing	Perform periodic road watering activities Conduct public health monitoring and prepare health care support if needed
29	Potential disruption of community mobility due to road damage due to mobilization of plantation operations	Palm Fruits Processing	Improving the quality of plantation roads so as not to be easily damaged Conduct monitoring of road conditions and repairs in case of damage
30	Potential conflict arising between indigenous peoples and migrant workers	Palm Fruits Processing	Strengthening Capacity and work patterns of the community in order to compete with migrant communities Maximize grievance and conflict resolution mechanisms
31	Potential reduction in income of KPMA members due to reduced plasma area due to reduction of areas that support the existence of HCV and HCS	Environmental management	Re-negotiating with indigenous peoples and preparing plasma replacement mechanisms Maximize grievance and conflict resolution mechanisms
32	A reduce in potential of public food sources due to the imposition of legal sanctions for illegal activities of hunting for protected species	Environmental management	Providing community support for access to other hunting areas Strengthening community knowledge and capacity on replacement nutrition sources such as cultivation / livestock

Table 38. Social and Environmental Management Plan

Program	Activity	Strategy	Time Plan
Resolving land tenure related to customary right around company area	Problem solving disagreements communal land development plan for oil palm plantations	<ul style="list-style-type: none"> Held a customary meeting of all the sub-tribes in tribe Yeresiam 	2018-2020
	Inventory land ownership around the village areas	<ul style="list-style-type: none"> Build communication involving heads of tribes, sub-tribes, village officials, community leaders and law enforcement agencies in solving the problem of customary rights Enclave on the location-the location that does not allow for open palm plantation (settlement, forest sago, sago tree, sacred areas) 	2018-2020
Build communication and network with all related stakeholders of PT. Sariwana Adi Perkasa	Regular meeting with all stakeholders	<ul style="list-style-type: none"> Develop a routine meeting schedule Determine a topic of each meeting Documentation of meeting result Follow up the meeting result 	Start from 2018
	Socialization with customary right tribe	<ul style="list-style-type: none"> Conduct regular meetings, especially with the chiefs, heads of sub-tribes, village officials, community leaders and land owners 	2018
Improve the educational quality of society	Develop a plan to improving an educational aspect from kindergarten to Senior High School	<ul style="list-style-type: none"> Using educational consultant Cooperation and communication with Educational Agency of Nabire 	Start from 2020
	Provide the auxiliary teacher	<ul style="list-style-type: none"> Provide the auxiliary teacher for teaching in the Sima Village 	Start from 2020
	Provide the scholarship	<ul style="list-style-type: none"> Develop a detail plan related to scholarship scheme Conduct a selection process with related stakeholder 	Start from 2018
Improve the health quality of society	Conducting studies on issues and health problems in Sima Village	<ul style="list-style-type: none"> In cooperation with the Health Agency of Nabire Optimizing the company's health officer 	2018
	Conduct a counseling, health checks and treatment to communities	<ul style="list-style-type: none"> Determine the counseling materials most needed by the community Conduct activities in cooperation with local health office 	Start From 2018
Economic Empowerment of	Conduct Potential Economic Analysist	<ul style="list-style-type: none"> Focus group discussion with local community for identifying potential economic that can be 	2018

Program	Activity	Strategy	Time Plan
Society		<ul style="list-style-type: none"> developed Conduct a study involving a consultant related to community economic development 	
	Develop a demonstration plot of annual food crops	<ul style="list-style-type: none"> Preparation of Organizational and Institutional in the community level Conduct a training related to annual food crops cultivation. Continuous mentoring related to annual food crops cultivation 	2018-2022
	Counseling and training in order to create business opportunities and alternative livelihoods	<ul style="list-style-type: none"> Continuous mentoring Conduct a training for entrepreneurship Facilitation of capital and business equipment Ongoing mentoring activities both in terms of production and marketing 	2018-2022
	Develop a small holder scheme	<ul style="list-style-type: none"> Conduct intensive meetings to disseminate information about the scheme of plasma cooperation especially with respect to area, the rules and requirements necessary Conduct a meeting with the community to create a plasma participatory planning Involving the community, traditional leaders and village government in the plasma program development 	2018-2022
Environmental Improvement Program	Campaigning, training and dissemination of 3R (Reduce-Reuse-Recycle) to the community	<ul style="list-style-type: none"> Cooperating with professional consultants in the 3R implementation Creating productive goods as a result of activities 3 R. 	Start from 2018
	Management / conservation of ground water	<ul style="list-style-type: none"> Fresh water monitoring, especially in the dry season Conduct a ground water conservation training to the company staff and local community 	Each year, start from 2018
	Reduction of river water pollution	<ul style="list-style-type: none"> Conduct training on a regular basis to the waste management officer Regular training of waste treatment Improvement the quality of waste treatment technology Monitoring the quality of river water periodically 	Each year, start from 2018
Accessibility and	Facilitating the repair and construct of roads and	a. Make a road in the company area that can improve a	2012

Program	Activity	Strategy	Time Plan
public facilities Improvement Program	bridges	connection between villages b. Maintaining road quality together with local community	
	Supporting electricity program	<ul style="list-style-type: none"> • Cooperation with third party to search and implementing alternative electricity sources • Socialization to the community related to electricity program 	2018-2023

4.4. Summary of HCV-HCS Management and Monitoring Plan

Our integrated Management and Monitoring Plan has been developed to incorporate the important principles of the HCV approach and HCS Approach. The plan sets out objectives and targets to mitigate threats according to the results and recommendations from assessments. This includes commitments to:

1. Maintain and if possible, improve HCVs in the management area by addressing the threats against HCVs, in particular to protect rare, threatened and endangered species and safeguard rare ecosystems.
2. Prevent deforestation or degradation of High Carbon Stock forest.
3. Prohibit any new development on peatland, regardless of peat depth.
4. Implement Best Management Practices for the development and management of oil palm plantations with minimal environmental impacts, e.g. to protect from the effects of soil erosion and sedimentation to safeguard watersheds and minimise the risks of flooding.
5. Ensure local and indigenous communities have sustainable access to basic needs and cultural values and that their rights are fully respected.

Management and monitoring will be implemented in a collaborative manner through engagement with key stakeholders including government institutions NGOs and local communities.

The major risk to HCV and HCS forest areas in PT SAP is forest degradation due to continued uncontrolled logging for timber production. The site is located in an area that was previously Permanent Production Forest. Some of the timber / timber companies that have been operating in this region include PT Nabire Raya (1982-1986), PT Cedco (1987-1991), PT Pakarti Yoga (1992-1997), PT Barito Pacific, and PT Kaibus (1992- 1997). Logging company concessions all ended by 2001 but illegal logging continues.

The second risk identified is from clearing of land for smallholder agriculture. Fire is traditionally used by communities to open up land during the dry season. NASA hotspot data 2012-2016 revealed that small scale fires have occurred inside concession area - most fires were in the vicinity of villages. Interviews and field observation show that area surrounding concession area never suffered from large scale fire.

Table 39. The important principles of the HCV approach.

Principles	Description ^{4 5}
<p>Legality and safeguards of land tenure rights, customary rights and consent</p>	<p>Land use right can be demonstrated and are not questioned by local community who hold tenurial right. Land use or land management should not reduce customary rights of local community, indigenous people, or other land users, without free, prior, informed consent. A good land management should be based on proper economic planning to ensure the prosperity of community who depends on the land. Free prior informed consent (FPIC) covers the rights of indigenous people or local community to give, hold or withdraw their agreement on activities that may be detrimental to their rights.</p>
<p>Wider landscape approach</p>	<p>The influence of management unit may reach areas outside concession. Some HCV management areas are designed to preserve a HCV both inside concession and in area outside concession that might be influenced by management unit in a wider landscape. Management unit has a responsibility to be involved with other management unit of nearest areas and related stakeholders to coordinate for management plan and initiatives for the wider landscape. Organization is responsible to avoid HCV destruction beyond their concession area and to take into account activities occurred outside their area. If possible, they should involve surrounding stakeholders to help solving HCV management problems.</p>
<p>Precautionary approach</p>	<p>If there is a credible and sensible indication of an HCV, management unit should always assume that the HCV is present. They should make an appropriate decision to manage and monitor the HCV. "Precautionary approach demands that if information available shows that management activities will cause severe or irreversible damage to the environment and/or threaten human welfare, organization will take explicit and effective measures to prevent the damage and risks, even when the scientific information is incomplete or inconclusive, and when the vulnerability and sensitivity of values are uncertain" (FSC 2012b5).</p>
<p>Participatory and Transparent</p>	<p>Stakeholder involvement and consultation with experts are necessary, especially if production scale and intensity or external threat against HCV are considered high. Consult with people who know the area well (researcher, government specialist, NGO, and other relevant stakeholders) to obtain new knowledge. Build consensus on management strategy to solve conflicts.</p>

⁴ Brown, E., N. Dudley, A. Lindhe, D.R. Muhtaman, C. Stewart, and T. Synnott (eds.). 2013 (October). Common guidance for the identification of High Conservation Values. HCV Resource Network.

⁵ Brown, E. and M.J.M. Senior. 2014 (September). Common guidance for the Management and Monitoring of High Conservation Values. HCV Resource Network.

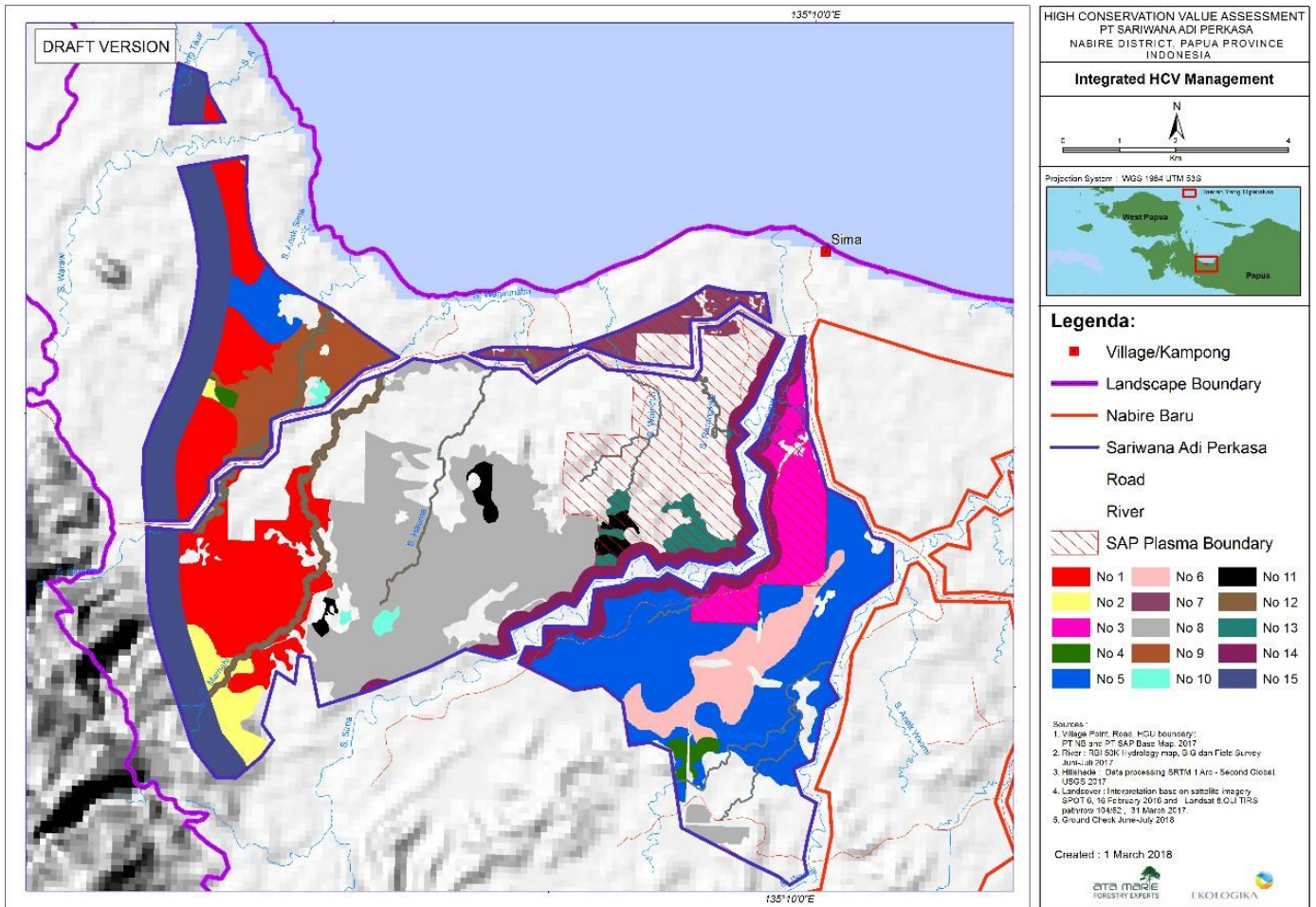


Figure 29. Map of integrated HCV Management in PT SAP

Table 40. Integrated Management Plan in PT Sariwana Adi Perkasa

No.	Integrated Management Area	Core	Smallholders	Total
1	Management Area for CR species (Black Spotted Cuscus), RTE Wildlife and Vegetation, naturally occurred representative species, and wildlife viewed as cultural identity (HCVMA 1.2, HCVMA 1.3, HCVMA 2.3 and HCVMA 6)	661 ha		661 ha
2	Management Area for CR species (Black Spotted Cuscus), RTE Wildlife and Vegetation, naturally occurred representative species, erosion prevention, and wildlife viewed as cultural identity (HCVMA 1.2, HCVMA 1.3, HCVMA 2.3 , HCVMA 4.1 and HCVMA 6)	99 ha		99 ha
3	Management Area for RTE Wildlife and Vegetation, ecotone and naturally occurred representative species (HCVMA 1.2, HCVMA 1.3, HCVMA 2.3)		239 ha	239 ha
4	Management Area for RTE Wildlife and Vegetation, ecotone and naturally occurred representative species, erosion prevention and wildlife viewed as cultural identity (HCVMA 1.3, HCVMA 2.2, HCVMA 2.3 , HCVMA 4.2 and HCVMA 6)	34 ha		34 ha
5	Management Area for RTE Wildlife and Vegetation, ecotone and naturally occurred representative species , and wildlife viewed as cultural identity (HCVMA 1.3, HCVMA 2.2, HCVMA 2.3 ,and HCVMA 6)	810 ha		810 ha
6	Management Area for RTE Wildlife and Vegetation, ecotone and naturally occurred representative species , and wildlife viewed as cultural identity, water source and flood control (HCVMA 1.3, HCVMA 2.2, HCVMA 2.3 , HCVMA 4.1 and HCVMA 6)	215 ha		215 ha
7	Management Area for RTE Wildlife and Vegetation, naturally occurred representative species (HCVMA 1.3 and HCVMA 2.3)		117 ha	117 ha
8	Management Area for RTE Wildlife and Vegetation, naturally occurred representative species , and wildlife viewed as cultural identity (HCVMA 1.3 , HCVMA 2.3 and HCVMA 6)	977 ha		977 ha
9	Management Area for RTE Wildlife and Vegetation, naturally occurred representative species, and wildlife viewed as cultural identity, as well as construction material (HCVMA 1.3 , HCVMA 2.3 , HCVMA 5 and HCVMA 6)	199 ha		199 ha
10	Management Area for Cultural Sites (HCVMA 6 Situs)	23 ha		23 ha
11	Management Area for RTE Wildlife and Vegetation, naturally occurred representative species, wildlife viewed as cultural identity, and erosion prevention (HCVMA 1.3, HCVMA 2.3 , HCVMA 4.2 and HCVMA 6)	31 ha	24 ha	55 ha
12	Management Area for Riverbanks (HCVMA 4.1)	178 ha	28 ha	206 ha
13	Management Area for RTE Wildlife and Vegetation, naturally occurred representative species (HCVMA 1.3 and HCVMA 2.3)		67 ha	67 ha
14	Management Area for Riverbanks functioning as natural fire barriers, flood control, source of water, and to ensure the sustainability of feshwater fish (HCVMA 4.1 , HCVMA 4.2 and HCVMA 5)	115 ha	202 ha	318 ha
15	Management of Buffer Zone Area for Sima Protected Forest (HCVMA 1.1)	526 ha		526 ha
Total		3,867 ha	678 ha	4,545 ha

Table 41. Identification of Internal Threats and Mitigation (Management) to Protect HCV in SAP area

HCV/Sub-HCV	HCV Attributes/Presence	Internal Threat	Management for Internal Threat
HCV 1.1 Areas that Contain or Provide Biodiversity Support Function to Protection or Conservation Areas	Forest inside concession area adjacent to Sima protected forest	Low understanding among staffs about protected areas	<ul style="list-style-type: none"> - Affirmation and protection of HCV Area 1-3 by not converting forest within assessment area into plantation area - Establishment of protected area for HCV 1 and HCV 2 inside concession area. - Protected areas for HCV 1-3 are marked with stone border marker instead of road or ditch, and information boards are installed. - Awareness campaign for staffs, day laborers, and contractors on the existence and the importance of HCV 1-3 wildlife, vegetation, habitat and ecosystem - Provide handbook/pocket book and information boards contains pictures and general description of HCV 1 – 3, HCV 1.2, HCV 1.3 species and HCV 2.3 species indicator - Hunting prohibition (for HCV 1.2 and 1.3 species) for staffs, day laborers and contractors, accompanied by sanctions for the perpetrators. - Develop SOP for land clearing and maintenance operations conducted near HCV 1-3 protected area to avoid disrupting HCV 1.2, HCV 1.3 and HCV 2.3 species - Road planning and construction should not create fragmentation on forest to protect HCV 1-3 as the habitat for HCV 1.2 and HCV 1.3 species. - Not constructing roads near HCV 1-3 protected area - Close and reroute infrastructures (road, ditch, mill) which caused habitat fragmentation for HCV 1.2 and HCV 1.3 species - Ensure that the construction of wooden infrastructure refrains from using timber from HCV 1.3 species and/or harvested from HCV Area 1-3, by establishing SOP to prevent contractors from harvesting HCV 1.3 species and from HCV area 1-3.
HCV 1.2 Critically Endangered Species (IUCN red list - CR)	Mammals Black Spotted Cuscus (<i>Spiloglossus rufoniger</i>)	HCV 1.2 Species hunting by company staff Low understanding among staffs about protected wildlife Access or access improvement that encourages hunting Opening of block roads	
HCV 1.3 Viable Populations of Endangered, Restricted Range or Protected Species	Vegetation: <i>Flindersia pimenteliana</i> (Rutaceae) (EN) , <i>Intsia bijuga</i> , <i>Pterocarpus indicus</i> (Fabaceae), <i>Myristica subalulata</i> (Myristicaceae), <i>Anisoptera thrurifera polyandra</i> (Dipterocarpaceae)(VU), and <i>Aquilaria filaria</i> (Thymelaeaceae)	Staff and contractor’s lack of understanding about HCV 1.3 species Access or access improvement that disrupt habitat Timber demand for infrastructure construction	
HCV 1.3 Viable Populations of Endangered, Restricted Range or Protected Species	Mammals: <i>Phalangeridae</i> Familia; <i>Spiloglossus rufoniger</i> , <i>Spiloglossus maculatus</i> , <i>Phalanger intercasttelanus</i> ; <i>Macropodidae</i> Familia: <i>Dorcopsis muelleri</i>	HCV 1.3 Species hunting by company staff Low understanding among staffs about protected or rare wildlife Access or access improvement that encourage hunting	
HCV 1.3 Viable Populations of Endangered, Restricted Range or Protected Species	30 avian species	Low understanding among staffs about protected or rare wildlife Access or access improvement that encourage hunting Opening of block roads	
HCV 2.2 Areas that Contain Two or More Contiguous	Ecotone between lowland swamp forest and lowland forest	Fragmentation of forest ecosystem due to infrastructure construction (roads, ditches, and building)	

HCV/Sub-HCV	HCV Attributes/Presence	Internal Threat	Management for Internal Threat
Ecosystems		Low understanding among staffs on the importance of ecosystem	
HCV 2.3 Areas that Contain Representative Populations of Most Naturally Occurring Species	All eagles, hornbill, Pigeons, Lories and Cockatoo, Cassowary, Bird of Paradise, Lao-lao	Fragmentation of forest ecosystem due to operational activities Low understanding among staffs on the importance of ecosystem	
HCV 3. Rare, threatened, or endangered ecosystems, habitats or refugia.	Rare ecosystem: Lowland Grassland on Plains ecosystem, Mountainous Lowland Forest ecosystem, Mangroves and Estuarine ecosystem, waterbodies/lakes (no management area)	Fragmentation of forest ecosystem Lack of understanding on rare and endangered among company staff	
HCV 4.1. Areas or Ecosystems Important for the Provision of Water and Prevention of Floods for Downstream Communities	Waterbodies and riverbank, swamp forest ecosystem, mangroves and estuarine ecosystem	Clearing of riverbank for oil palm plantation Construct road and other infrastructure by filling the river Lack of information on river position Ditch construction that alter river flow. Washing spray equipment in the river Liquid Waste discharge into river (later when factory is built) Lack of understanding on ecosystem service (supplying water and preventing flood) among company staff	<ul style="list-style-type: none"> - Affirmation and protection of HCV Area 4.1, 4.2 and 4.3 to prevent forest conversion - Practicing Best Management Practices for land clearing around HCV Area 4.1, 4.2, and 4.3 - Repairing altered river courses - Mapping all rivers and tributaries up to order 2-3 and re-measuring riverbanks - Ensure the implementation of SOP on washing boundary of spray equipment (drainage into river) and give sanctions for perpetrators. - Ensure the implementation of SOP on waste management - Using mechanical and vegetative land conservation techniques for road construction in slope area or area with TBE <180 ton/ha/year - Ensure the implementation of SOP on land cover crop planting and maintaining in slope area or area with erosion potential <180 ton/ha/year - Provide handbook/pocket book and information
HCV 4.2 Areas Important for the Prevention of Erosion and Sedimentation	Hilly area with TBE value > 180 ton/ha/year	Land clearing and oil palm planting in riverbank Land clearing in hill slope Area with TBE 180/ton/ha/year Road construction through hills Lack of understanding on forest function in preventing erosion riverbank sedimentation among staffs	

HCV/Sub-HCV	HCV Attributes/Presence	Internal Threat	Management for Internal Threat
HCV 4.3 Areas that Function as Natural Barriers to the Spread of Forest or Ground Fire	Swamp forest and Sima River	Forest clearing for oil plam planting Forest clearing for infrastructure construction Lack of understanding on forest function as fire barried among staffs	boards contains pictures and general description of HCV 4.1, 4.2, 4.3 <ul style="list-style-type: none"> – Awareness campaign for staffs and contractors on ecosystem service functions – Regular participatory patrol in HCV Management Area 4.1, 4.2, 4.3 to control illegal logging in forest and upstream area
HCV 5 Carbohydrate Source	Natural and cultivated sago, tubers (betatas, ubi jalar, singkong, sukun hutan)	Land Conversion of dusun sago and farmlands into oil palm plantation Conflicts between various HCV managements	<ul style="list-style-type: none"> – Establish SOP on HCV 5 management which provide protection on HCV 5 against potential damage caused by plantation/operation activities, and to ensure community access to HCV 5 natural resources – Dissemination of HCV 5 management tools and implementation enforcement – Installation of information board on restriction on operational activities in HCV 5 management area
HCV 5 Protein Source	Freshwater fish: Ikan gabus, lele, bethik, tawes, gurami, nila, belut, udang, kepiting Brackish water fish; bolana/belanak (mullet fish), somasi (bass), kakap putih (baramundi), kakap merah (mangrove jack) Saltwater fish; ikan kombong, mumar, oci, cakalang, tengiri, barakuda, layur, goropa, bobara, gumuru, ikan terbang, sako, udang, kepiting, bia, gurita, suntung, puri. Non fish: soa-soa, snakes, crocodile, kerang/bia, ulat kayu bakau, bats	Migration of fish and non-fish protein source due to habitat loss following the construction of oilpalm plantation. Access to protein source to harvest and use them sustianably is blocked	
HCV 5 Fresh water for drinking and cooking	Wells (groundwater)	Potential construction activities and plantation operation in water catchment area No buffer between oil palm trees and spring protection area Potential contamination from fertilizer residue, herbicide, pesticide and rodenticide around water catchment area	
HCV 5 Fresh water for sanitation	Wells and river	Potential construction activities and plantation operation in water catchment area Potential contamination from fertilizer residue, herbicide, pesticide and rodenticide around water catchment area.	

HCV/Sub-HCV	HCV Attributes/Presence	Internal Threat	Management for Internal Threat
		Alteration of riverflow and oil palm planting in riverbanks Land conversion of riverbank as local protection area	
HCV 5 Direct Income Source (sea)	Fish and other seafood products: ikan kombong, mumar, oci, cakalang, tengiri, barakuda, layur, goropa, bobara, gumuru, ikan terbang, sako, udang, kepiting, bia, gurita, suntung, puri, puri halus/nasi	Potential contamination from fertilizer residue, herbicide, pesticide and rodenticide Potential contamination of oil, lubricant oil, domestic waste and CPO liquid waste	
HCV 5 Non-Timber Construction Material	Nibung stem and leaves, Rattan	Potential land conversion for plantation expansion or infrastructure construction Excessive oilpalm planting over forest ecosystem boundary	
HCV 5 Timber Construction Material	Timber: Merbau, matoa, agatis, damar, masoi, empaka, lawang	Potential land conversion for plantation expansion or infrastructure construction Excessive planting over forest ecosystem boundary Conflicted HCV management between different HCVs	
HCV 5 Vitamin Source	Fruits (Dusun Cempedak, Surrounding Goa Nenggoina and Goa Nenggomana)	Potential land conversion for expansion or infrastructure	
HCV 6 Sacred Sites	Goa Nenggoina Goa Nenggomana Ruija Rujahi Parigi Hamuku Bekas Kampung Hamuku Sungai busuk (Rarantiruma) Air Mabuk Anapireoonggre (in Yaur language)/ Babrauguapi (in Yerisiam language)	Reduced and loss of HCV 6 sites along with the loss of artifacts within and local/tribal history Expansion of oil palm plantation and opeational activities, such as land preparation Lack of understanding HCV 6 sites among contractors and Staffs.	<ul style="list-style-type: none"> - Establish SOP on land preparation which integrated with HCV 6 components - Dissemination of aforementioned SOP to staffs and contractors, including introduction to identified sacred sites/HCV 6 - Land clearing is supervised by Land Preparation Assistant with the knowledge on the importance of HCV 6 - Implementing more ecological management and construction of ditches, especially in areas near HCVA/HCVMA - Affirmation, marking and protection activities for HCVA/HCVMA Sago (<i>Metroxylon sagu</i>) (HCV 5/6)
HCV 6 Important Cultural Sites	Dusun Sagu Bokai, Dusun Sagu Kampung Sima, Dusun Sagu Manarueja, Dusun Sagu Nahina Mahire, Dusun Sagu Yarawobi	Staffs and contractors are not knowledgeable on the location of HCV 6 sites	
HCV 6	Bird of Paradise	Land clearing contractor and supervisory staffs do	

HCV/Sub-HCV	HCV Attributes/Presence	Internal Threat	Management for Internal Threat
Culturally Important Species		not know the location of the habitat of bird-of-paradise Hunting of Bird-of-Paradise	
HCV 6 Culturally Important Species	Sago (Metroxylon sago)	Land clearing contractor and supervisory staffs do not know the location of sago grooves for HCV 5-6 purposes Drying of sago habitat due to drainage ditch management Potential conversion of sago habitat/swamp forest and dusun sago.	

Table 42. Identification of External Threats and Mitigation (Management) to Protect HCV in SAP Area

HCV/ Sub HCV	HCV Attributes	External Threat	Management for External Threat
HCV 1.1 Areas that Contain or Provide Biodiversity Support Function to Protection or Conservation Areas	Forest inside concession area adjacent to Sima protected forest	<ul style="list-style-type: none"> - Lack of knowledge among local people on protected forest area - Forest fragmentation due to provincial road - Illegal logging 	<ul style="list-style-type: none"> - Provide alternative protein source to alleviate/reduce hunting of HCV 1.2. and HCV 1.3 species, and HCV 2.3 indicator species - Hunting prohibition for HCV 1.2. and HCV 1.3 species within HCV 1.2 and HCV 1.3 protection area inside SAP HGU - Joint patrol with local people to reduce illegal logging and poaching.
HCV 1.2 Critically Endangered Species	Mammals Black Spotted Cuscus (<i>Spiloglossus rufoniger</i>)	<ul style="list-style-type: none"> - Hunting of HCV 1.2 species for food - Illegal logging at HCV 1.2 habitat - Lack of knowledge and awareness on wildlife conservation, especially HCV 1.2 species. 	<ul style="list-style-type: none"> - Encourage law enforcement for illegal logging cases - Work with local tribes to regulate logging in forest classified as HCVMA 1.2, 1.3, 2.2 and 2.3
HCV 1.3 Viable Populations of Endangered, Restricted Range or Protected Species	Vegetation: <i>Flindersia pimenteliana</i> (Rutaceae) (EN) , <i>Intsia bijuga</i> , <i>Pterocarpus indicus</i> (Fabaceae), <i>Myristica subululata</i> (Myristicaceae), <i>Anisoptera thrurifera polyandra</i> (Dipterocarpaceae)(VU), and <i>Aquilaria filaria</i> (Thymelaeaceae) (Appendix.II).	<ul style="list-style-type: none"> - Forest clearing in water catchment area or upstream area by local people - Harvesting HCV 1.3 species for carpentry material - Lack of knowledge and awareness on HCV 1.3 species (rare, threatened, endangered) 	<ul style="list-style-type: none"> - Facilitate agreement between timber user communities to regulate/manage logging, such as restriction on diameter, restriction on number of trees to be cut down, and encourage the agreement into practice. - Work with local tribes and village government to develop village and farmland development plans.
HCV 1.3 Viable Populations of Endangered, Restricted Range or Protected Species	Mammals: Phalangeridae Familia; <i>Spiloglossus rufoniger</i> , <i>Spiloglossus maculatus</i> , <i>Phalanger intercasttelanus</i> ;	<ul style="list-style-type: none"> - Hunting of HCV 1.3 species by local people - Lack of understanding and awareness of local people on the importance of wildlife conservation, not only protected animals but also game animals. - Illegal logging 	<ul style="list-style-type: none"> - Facilitate intensive farming pattern to reduce expansion to HCV area 2 and 3

HCV/ Sub HCV	HCV Attributes	External Threat	Management for External Threat
	Macropodidae Familia: <i>Dorcopsis muelleri</i>	<ul style="list-style-type: none"> - The existence of Provincial road provide easy access for mammals hunting. 	
HCV 1.3 Viable Populations of Endangered, Restricted Range or Protected Species	30 avian species (see Error! Reference source not found.)	<ul style="list-style-type: none"> - Excessive hunting of HCV species - Lack of understanding and awareness on HCV 1.3 species among local people - Illegal logging 	
HCV 2.2 Areas that Contain Two or More Contiguous Ecosystems	Ecotone between lowland swamp forest and lowland forest	<ul style="list-style-type: none"> - Conversion from forest into non-forest by local people - Lack of understanding and awareness on the importance of ecosystem and ecotones among local people 	
HCV 2.3 Areas that Contain Representative Populations of Most Naturally Occurring Species	All eagles, hornbill, Pigeons, Lories and Cockatoo, Cassowary, Bird of Paradise, <i>Lao-lao</i>	<ul style="list-style-type: none"> - Conversion from forest into non-forest by local people - Lack of understanding and awareness on natural ecosystem - Hunting of natural population indicator species - Illegal Logging 	
HCV 3. Rare, threatened, or endangered ecosystems, habitats or refugia.	Rare ecosystem: Lowland Grassland on Plains ecosystem, Mountainous Lowland Forest ecosystem, Mangroves and Estuarine ecosystem, waterbodies/lakes (no management area)	<ul style="list-style-type: none"> - Lack of understanding on rare ecosystem 	
HCV 4.1. Areas or Ecosystems Important for the Provision of Water and Prevention of Floods for Downstream Communities	Waterbodies and riverbank, swamp forest ecosystem, mangroves and estuarine ecosystem	<ul style="list-style-type: none"> - Land conversion in water catchment area and riverbank for farming purposes. - Illegal logging activities in upstream area, both by companies and communities - Gold and sand mining activities - Construction of government/provincial road that alter river course - Lack of understanding on ecosystem services in providing water and preventing flood among local people. 	<ul style="list-style-type: none"> - Participatory patrols within HCVMA 4.1, 4.2, and 4.3 to control illegal logging at upstream area - Create agreement with communities, tribe elders and village officials to regulate timber harvesting and land clearing in order to avoid disrupting ecosystem services (HCV 4.1, 4.2, 4.3) - Installation of information board that contains picture and general description of HCV 4.1, 4.2 and 4.3, in the name of village government, local tribe and company
HCV 4.2 Areas Important for the Prevention of Erosion and Sedimentation	Hilly area with TBE value > 180 ton/ha/year	<ul style="list-style-type: none"> - Illegal logging on area with high erosion hazard level (>180 ton/ha/year) and on upstream area - River sedimentation due to mining activities - Land conversion of riverbanks by local people - Land conversion in area with high erosion hazard level (>180 ton/ha/year) by local people 	<ul style="list-style-type: none"> - Raise awareness and provide information to local people on forest and river ecosystem service functions

HCV/ Sub HCV	HCV Attributes	External Threat	Management for External Threat
		<ul style="list-style-type: none"> – Lack of understanding on forest function in preventing erosion and riverbank sedimentation among local people 	
HCV 4.3 Areas that Function as Natural Barriers to the Spread of Forest or Ground Fire	Swamp forest and Sima River	<ul style="list-style-type: none"> – Land conversion for farming purposes – Land clearing using fire on dry season – Illegal logging – Lack of understanding on forest function as natural fire barrier among local people 	
HCV 5 Carbohydrate Source	Natural and cultivated sago, tubers (betatas, ubi jalar, singkong, sukun hutan)	<ul style="list-style-type: none"> – Land conversion of <i>Dusun Sagu</i> and farming area for settlement expansion and infrastructure construction purposes – Whirlwind, lightning, land and forest fire 	<ul style="list-style-type: none"> – Establish and enforce HCV 5 management rules – Community organizing and capacity building for communities who manage HCV 5 attributes – Socialisation and education on HCV 5 management in each community
HCV 5 Protein Source	<ul style="list-style-type: none"> – Freshwater fish: <i>Ikan gabus, lele, bethik, tawes, gurami, nila, belut, udang, kepiting</i> – Brackish water fish; <i>bolana/belanak</i> (mullet fish), <i>somasi</i> (bass), <i>kakap putih</i> (baramundi), <i>kakap merah</i> (mangrove jack) – Saltwater fish; <i>ikan kombong, mumar, oci, cakalang, tengiri, barakuda, layur, goropa, bobara, gumuru, ikan terbang, sako, udang, kepiting, bia, gurita, suntung, puri.</i> – Non fish: <i>soa-soa</i>, snakes, crocodile, <i>kerang/bia, ulat kayu bakau</i>, bats 	<ul style="list-style-type: none"> – Excessive hunting of protein source with no consideration for species limitation and without regard of protection status – Local community do not have any regulation whatsoever in regard to limit or manage hunting mechanism – Local community do not have any traditionally agreed catchment space or area – Local people do not possess optimum understanding on protected species 	<ul style="list-style-type: none"> – Installation of information board in the name of village government, local tribe and company – Community based hydrometeorological risk management and climate change adaptation, in relation to HCV 5 attributes – Establish village spatial pattern
HCV 5 Fresh water for drinking and cooking	Wells (groundwater)	<ul style="list-style-type: none"> – Potential conversion of spring protection area into farming area, settlement, and/or public facilities. – Illegal logging in spring protection area – Prolonged dry season 	
HCV 5 Fresh water for sanitation	Wells and river	<ul style="list-style-type: none"> – Conversion of local protection area – Illegal logging in local protection area 	
HCV 5 Direct Income Source	Fish and other seafood products: <i>ikan kombong, mumar, oci, cakalang, tengiri,</i>	<ul style="list-style-type: none"> – Harvesting of fish and non-fish product through unsustainable method (bomb, poison, trawl) 	

HCV/ Sub HCV	HCV Attributes	External Threat	Management for External Threat
(sea)	<i>barakuda, layur, goropa, bobara, gumuru, ikan terbang, sako, udang, kepiting, bia, gurita, suntung, puri, puri halus/nasi</i>	use), by people from other area – Excessive fish harvesting using small-eyed net (less than 2 inch) – Water pollutions, liquid and solid domestic waste from settlements along rivers that emptied into Teluk Cendrawasih	
HCV 5 Non-Timber Construction Material	– Nibung stem and leaves, – Rattan	– Potential of illegal logging activities by people who lives near material sources – Conversion of land into other purposes	
HCV 5 Timber Construction Material	Timber: <i>Merbau, matoa, agatis, damar, masoi, empaka, lawang</i>	– Potential of illegal logging activities by local people. – Conversion of land into other purposes	
HCV 5 Vitamin Source (Fruit)	Fruits (<i>Dusun Cempedak, Surrounding Goa Nenggoina and Goa Nenggomana</i>)	– Conversion of farmland into other purposes – Pest, flood, drought	
HCV 6 Sacred Sites	– <i>Goa Nenggoina</i> – <i>Goa Nenggomana</i> – <i>Ruija</i> – <i>Rujahi</i> – <i>Parigi Hamuku</i> – <i>Bekas Kampung Hamuku</i> – <i>Sungai busuk (Rarantiruma)</i> – <i>Air Mabuk</i> – <i>Anapireoonggre</i> (in Yaur language)/ <i>Babrauguapi</i> (in Yerisiam language)	– Conversion of HCV 6 area into farms, settlement, smallholders. – Abrasion	– Develop model on information of site location, from relevant authority and/or village government/customary institution – Periodic check on land trade by the authorities – Participatory mapping on HCV 6 and establish the area as local protection zone – Establish spatial pattern for village/tribes – Affirmation, marking and protection activities for HCVA/HCVMA Sago (<i>Metroxylon sago</i>) (HCV 5/6)
HCV 6 Important Cultural Sites	<i>Dusun Sagu Bokai, Dusun Sagu Kampung Sima, Dusun Sagu Manarueja, Dusun Sagu Nahina Mahire, Dusun Sagu Yarawobi</i>	Conversion <i>Dusun Sagu</i> into farmland, settlement, or smallholders.	– Revitalize sago (<i>Metroxylon sago</i>) honoring traditions among local tribes and communities.
HCV 6 Culturally Important Species	Bird of Paradise	– Opportunistic hunting of bird-of-paradise species – Illegal logging – Forest conversion	
HCV 6 Culturally Important Species	Sago (<i>Metroxylon sago</i>)	– Excessive use by local people – Disruption to sago habitat due to unsustainable cultivation / use of sago – Potential of land conversion or land release of sago habitat/swamp forest and <i>Dusun Sagu</i>	

Table 43. Management Recommendation to Protect/Enhance HCV in PT SAP

HCV /Sub-HCV Attribute		HCV Area/HCV Management Area	Management	Monitoring
HCV 1.1	Forest inside concession area, directly adjacent to protected forest	<ul style="list-style-type: none"> – Buffer zone with Sima Protected Forest – Forest (HCVMA) (Lowland Forest on Plains and swamp forest adjacent to PF) 	<ul style="list-style-type: none"> – FPIC on HCV management (management plan and area) to local people/tribes – Habitat improvement using local vegetation species in area presumed as habitat for HCV 1.2 and HCV 1.3 – Build monitoring system for threat against HCV 1-3 – Rehabilitate all riverbank area which connected to forest – Restore degraded HCV 1.3 and HCV 2.3 using vegetation species preferred by birds. – Protect nesting trees of HCV 1.2, HCV 1.3 species and HCV 2.3 indicator species – Develop information and education media on HCV 1-3 	<ul style="list-style-type: none"> – Annual Quantitative Monitoring of HCV 1.2 and HCV 1.3 species to ensure their abundance – Monitoring result shall be analyzed by competent parties (expert/academician) and company – Conduct FGD with local people and staffs to measure their understanding level on HCV 1-3 – Conduct internal monitoring and evaluation in accordance to M&E SOP for land clearing – Construct permanent plot to monitor composition and structure vegetation. – Perform annual vegetation monitoring to ensure quantity, structure, composition, distribution, and abundance of indicator species using cruising method for 2 km on permanent or non-permanent forest transect – Perform annual quantitative mammals monitoring to ensure the abundance and distribution of indicator species using cruising method for 4 km transect. – Perform annual bird monitoring to ensure the abundance of indicator species using cruising method for 4 km transect. – Information on poaching, illegal logging and land conversion should be collected every three months to determine quality and quantity of damage – Evaluation on patrol result to identify any illegal activities within protected areas. – Perform update on rare ecosystem monitoring data – Threat monitoring using integrated monitoring system.
HCV 1.2	Mammals Black Spotted Cuscus (<i>Spiloglossus rufoniger</i>)	Forest (Lowland Forest on Plains ecosystem) (HCV Area and HCVMA)		
HCV 1.3	Vegetation: Flindersia pimenteliana (Rutaceae) (EN), Intsia bijuga, Pterocarpus indicus (Fabaceae), Myristica subululata (Myristicaceae) (VU), Anisoptera thurifera polyandra (Dipterocarpaceae)(VU) dan Aquilaria filaria (Thymelaeaceae) (Appendix II).	Forest (Lowland Forest on Plains ecosystem, Swamp Forest ecosystem) (HCV Area and HCVMA)		
HCV 1.3	Mammals: Phalangeridae Familia; <i>Spiloglossus rufoniger</i> , <i>Spiloglossus maculatus</i> , <i>Phalanger intercastellanus</i> ; Macropodidae Familia: <i>Dorcopsis muelleri</i>	Forest (Lowland Forest on Plains ecosystem, Swamp Forest ecosystem) (HCV Area and HCVMA)		
HCV 1.3	30 avian species (see Error! Reference source not found.)	Forest (Lowland Forest on Plains ecosystem, Swamp Forest ecosystem) (HCV Area and HCVMA)		

HCV /Sub-HCV Attribute		HCV Area/HCV Management Area	Management	Monitoring
HCV 2.2	Ecotone between lowland swamp forest and lowland forest	<ul style="list-style-type: none"> – Forest (Lowland Forest on Plains ecosystem, Swamp Forest ecosystem) (HCVMA) – Ecotone (HCV Area) 		
HCV 2.3	All eagles, hornbill, Pigeons, Lories and Cockatoo, Cassowary, Bird of Paradise, <i>Lao-lao</i>	Forest (Lowland Forest on Plains ecosystem, Swamp Forest ecosystem) (HCV Area and HCVMA)		
HCV 3	Rare ecosystem: Lowland Grassland on Plains ecosystem, Mountainous Lowland Forest ecosystem, Mangroves and Estuarine ecosystem, waterbodies/lakes (no management area)	Lowland Grassland on Plains Ecosystem, Mountainous Lowland Forest ecosystem, Mangroves and Estuarine ecosystem, waterbodies/lakes (without management area) (HCV Area)		
HCV 4.1.	Waterbodies and riverbank, swamp forest ecosystem, mangroves and estuarine ecosystem	<ul style="list-style-type: none"> – Forest – Riverbank (HCV Area and HCVMA) 	<ul style="list-style-type: none"> – Using gully plugs to manage and secure small cracks on waterway cliffs – Rehabilitate riverbanks and upstream forest using local vegetation. – Rehabilitation for degraded slope area with high erosion hazard level (>180 ton/ha/year) – Information and education media development for HCV 4.1, 4.2, 4.3 – Build threat monitoring system 	<ul style="list-style-type: none"> – Ensure that internal monitoring and evaluation is conducted in accordance to SOP – Conduct <i>Ground check</i> to ensure no oil palm planting in area with high erosion hazard level (> 180/ton/ha/year) and in riverbanks – Periodic quality measurement (during plantation and later when the mill is active) to rivers affected by operational activities – Monitoring drainage outlet (ditch and river) that emptied to Cendrawasih Bay in cooperation with BKSDA and Teluk Cendrawasih Marine National Park) – Monitor erosion and sedimentation in slope area where oil palm is planted by constructing erosion monitoring traps every three months – Monthly measurement of river turbidity during rain season and every three month during dry season – Monitor potential hotspot during dry season – Monitor threat against HCV 4.1, 4.2 and 4.3 using Integrated monitoring system
HCV 4.2	Hilly area with TBE value > 180 ton/ha/year	<ul style="list-style-type: none"> – Potential <i>TBE</i> > 180 ton/ha/year (HCV area) – Hills with <i>TBE</i> > 180 ton/ha/year (HCVMA) 		
HCV 4.3	Swamp forest and Sima River	<ul style="list-style-type: none"> – Swamp Forest and River (HCVA and HCVMA) – Riverbank (HCVMA) 		

HCV /Sub-HCV Attribute		HCV Area/HCV Management Area	Management	Monitoring
HCV 5	Natural and cultivated sago, tubers (betatas, ubi jalar, singkong, sukun hutan)	<ul style="list-style-type: none"> - <i>Dusun Sagu</i> and swamp forest - Housing (HCVA) - <i>Dusun Sagu Bokai</i> (HCVMA) 	<ul style="list-style-type: none"> - Recommend company to provide subsidy to support food program as listed in village RPJM (<i>Rencana Pembangunan Jangka Menengah</i>, medium term development plan) - Support farmer and sago farmer by providing them access to productivity improvement, such as training and technical support. - Support to stakeholders in the effort to uphold the law and conduct collaborative management of marine environment in Teluk Cenderawasih - Provide support for fishermen to improve catchment result and to develop fish product marketing model - Support spatial planning for villages for food production and management purposes - Collaboration between SAP and local farmer group to increase economic value of natural sago and other crops - Install information board in the name of Village government, elders, and SAP. - Ensure the existence of <i>Dusun Sagu</i> and farmland to ensure food availability - Maintain connectivity of game's habitat inside UM area and outside UM area. - Conduct mapping on area where protected species present to lessen difficulties in monitoring and management - Identify and develop potential livestock to provide more access to protein. - Identify and develop alternative for direct income sources together with local people - Agreed and enforce regulations on timber harvesting (such as limiting timber diameter, limiting the number of trees to harvest, etc) 	<ul style="list-style-type: none"> - Document and analyze grievance and infraction for entering HCV management area for sago without permission from right holders or tribe elders. - Document and analyze the implementation of SOP that prohibit company operation activities in local protection area - Document and analyze the implementation of SOP that regulates fertilizer, herbicide, pesticide and rodenticide usage - Document and analyze fishing activities by local community/tribes - Document and analyze traditional fishing activities inside landscape - Document and analyze construction material collection and utilization - Document and analyze measures taken to protect, maintain, increase availability and access to freshwater fish in HCV 5 and HCV 6 management area - Patrol and threat documentation with local stakeholder, local people and tribes in groundwater and springs protection area. - Periodic patrols with local people and documenting potential threat against natural sago location and farmland - Involving right holders or tribe elders in land preparation activities conducted near HCV 5-6 management area - Periodic survey to staffs/contractors - Periodic survey to the community (interview and FGD with local community)
HCV 5	<ul style="list-style-type: none"> - Freshwater fish: <i>Ikan gabus, lele, bethik, tawes, gurami, nila, belut, udang, kepiting</i> - Brackish water fish; <i>bolana/belanak</i> (mullet fish), <i>somasi</i> (bass), <i>kakap putih</i> (baramundi), <i>kakap merah</i> (mangrove jack) - Saltwater fish; <i>ikan kombong, mumar, oci, cakalang, tengiri, barakuda, layur, goropa, bobara, gumuru, ikan terbang, sako, udang, kepiting, bia, gurita, suntung, puri.</i> - Non fish: <i>soa-soa, snakes, crocodile, kerang/bia, ulat kayu bakau, bats</i> 	<ul style="list-style-type: none"> - River and riverbanks (HCVMA) - River (HCVA) 		
HCV 5	Wells (groundwater)	- Settlement (HCVA)		
HCV 5	Wells and river	- River and riverbanks (HCVMA)		
HCV 5	Fish and other seafood products: <i>ikan kombong, mumar, oci, cakalang, tengiri, barakuda, layur, goropa, bobara, gumuru, ikan terbang, sako, udang, kepiting, bia,</i>	- River and riverbanks (HCVMA)		

HCV /Sub-HCV Attribute		HCV Area/HCV Management Area	Management	Monitoring
	<i>gurita, suntung, puri, puri halus/nasi</i>		<ul style="list-style-type: none"> - Establishment of groundwater and spring protection area - Enact that groundwater and spring protection area as restricted area and excluded from UM operational activities - Establishment of protection area /buffer area/riverbank with the involvement of local people - Diversification and/or intensification medicinal plants - Diversification and/or intensification timber production using superior local timber species - Develop public information media on river protection, in the name of local government and SAP - Conduct review on new planting/ expansion with the involvement of local stakeholders and tribes - Disseminate information on efficient and healthy use of firewood - Agreement to limit access to natural sago habitat (HCVMA) and sago plantation without permit from rightholders or tribe elders. 	
HCV 5	<ul style="list-style-type: none"> - Nibung stem and leaves, - Rattan 	Forest around Kampung Sima (HCVA and HCVMA)		
HCV 5	Timber: <i>Merbau, matoa, agatis, damar, masoi, empaka, lawang</i>	Forest around Kampung Sima (HCVA and HCVMA)		
HCV 5	Fruits (<i>Cempedak, etc</i>)	<i>Dusun Cempedak, near Goa Nenggoina and Goa Nenggomana</i> (HCVA)		
HCV 6	<ul style="list-style-type: none"> - <i>Goa Nenggoina</i> - <i>Goa Nenggomana</i> - <i>Ruija</i> - <i>Rujahi</i> - <i>Parigi Hamuku</i> - <i>Bekas Kampung Hamuku</i> - <i>Sungai busuk (Rarantiruma)</i> - <i>Air Mabuk</i> - <i>Anapireoonggre</i> (in Yaur language)/ - <i>Babrauguapi</i> (in Yerisiam language) 	Forest, River, Grassland (HCVA)	<ul style="list-style-type: none"> - Establish buffer zone for each site after HCV 6 is agreed upon consultation with relevant stakeholders. - Determine on site area, together with relevant parties. - Conduct ethnographic study on Yerisiam Tribe - Strengthen traditional governance and revitalize local traditional, cultural and social values - Develop information and education media on HCV 6 - Participatory mapping on <i>Dusun Sagu</i> - Develop information and education media 	<ul style="list-style-type: none"> - Routine monitoring to guard against vandalism or destruction on HCV 6 - Monitoring the implementation of SOP for land clearing where HCV 6 is present - Disseminate information on HCV 6 - Routine patrol and monitoring to protect HCV 6 - Record complaints from local people on access disruption to HCV 6 - Record complaints about HCV 6 boundary trespass caused by operational activities.

HCV /Sub-HCV Attribute		HCV Area/HCV Management Area	Management	Monitoring
HCV 6	<ul style="list-style-type: none"> - <i>Dusun Sagu Bokai</i> - <i>Dusun Sagu Kampung Sima</i> - <i>Dusun Sagu Manarueja</i> - <i>Dusun Sagu Nahina Mahire</i> - <i>Dusun Sagu Yarawobi</i> 	<ul style="list-style-type: none"> - <i>Dusun Sagu Bokai</i> (HCVMA) - <i>Dusun Sagu Kampung Sima, Dusun Sagu Manarueja, Dusun Sagu Nahina Mahire, Dusun Sagu Yarawobi</i> (HCVA) 	<ul style="list-style-type: none"> on the cultural value of <i>Dusun Sagu</i> - Bird-of-paradise habitat mapping and dissemination - Good practice of sago (<i>Metroxylon sagu</i>) use and cultivation in <i>Dusun Sagu</i> - Promote sago (<i>Metroxylon sagu</i>) honoring tradition to younger generation. 	
HCV 6	Bird of Paradise	Bird of paradise habitat (all remaining forest) (HCVA and HCVMA)		
HCV 6	Sago (<i>Metroxylon sagu</i>)	<ul style="list-style-type: none"> - <i>Sago (Metroxylon sagu) habitat (Swamp forest)</i> (HCVA) - <i>Dusun Sagu</i> (HCVMA) 		

4.5. Summary of Remediation and Compensation Plan

The result of LUCA and outcome of HCV Assessment has been used to calculate remediation and compensation liabilities (due to land clearance that followed the first HCV assessments).

Environmental Remediation:

In PT NB and SAP concessions a total of 571 ha of riparian areas is in need of environmental remediation while best management practices will be implemented for identified areas of peatland.

Social Remediation:

Identification of the loss of social HCV's (HCV 4, 5, and 6) was carried out via discussions, interviews and field inspections with relevant stakeholders, in particular Wanggar and Sima community members. There is no outstanding social liability as the loss of HCV 4 and 5 areas due to corporate activities has already been identified and remediated by the companies in a manner satisfactory to the affected parties.

Compensation:

Conservation liability has been decided by RSPO Compensation Panel and Complaints Panel according to the outcome of LUCA and HCV assessment. The Final Conservation Liability (FCL) for PT NB and SAP is 3,370 ha.

Concept note for the remediation and compensation plan has been approved by RSPO and full remediation and compensation plan is undergoing evaluation process. Remediation and compensation liabilities will be addressed through implementation of the following management plans:

1. PT NB and PT SAP On-site riparian zone remediation plan
2. PT NB and PT SAP On-site best management practices for peatland
3. Collective Compensation Plan for the Conservation of Customary Forest in Nabire, Papua.

The collective Compensation Plan will support the conservation of 3,370 ha of customary forest in Nabire, Papua Province. The proposed project area comprises forest currently designated as Other Land Use (*Areal Penggunaan Lain*), Protected Forest (*Hutan Lindung*) dan Production Forest (*Hutan Produksi*) under customary lands of Yaur and Yaro communities. Currently the quality of forest cover is good but there's no conservation program taken place in this area.

The Compensation plan aims to secure and restore forest quality through the social forestry mechanism to give the local people legal access in managing and utilizing the state forest. Under the social forestry scheme, the proposed compensation area will be granted a management right for a period of thirty-five years (can be extended). This will encourage customary communities to be involved in the planning, decision-making, implementation and management of the program. In the long-term, the community will be prepared to independently manage the Conservation Area for ecotourism and sustainable alternative incomes such as Non-timber Forest Product (NTFP) and environmental services.

The compensation project will be supported by a multi-stakeholder working group, comprising representatives of customary communities, local government agencies, nature conservation office (BBKSDA), academics and NGOs, engaging key stakeholders in a collaborative conservation program. It will be jointly designed with local key stakeholders such as the customary communities, Agency for

Regional Development (BAPPEDA), Natural Resources Conservation Office (BKSDA), academics and NGOs.

The proposed conservation compensation activities are designed to:

1. Enhance customary communities and stakeholders commitment in customary forest conservation management.
2. Reduce the direct pressures on forest and biodiversity.
3. Maintain and enhance forest quality.
4. Promote the sustainable use of natural resources.
5. Ensure the maintenance of ecosystem services.

Implementation of the participatory management plan will include forest monitoring and patrolling, regular meetings with the local community, capacity building activities and promoting sustainable livelihoods. A complete biodiversity baseline assessment will be required at the start of the project, building on the findings of the HCV. Monitoring and evaluation of the compensation plan will be conducted by measurable indicators of efficiency, effectiveness, and impact. Progress will be reported as documents and will be evaluated based on milestone according to the implementation timeline.

Methods of riparian remediation activities will combine conservation activities to promote the natural succession of forest trees species along with implementation of Best Management Practices in developed areas to minimize further negative impacts and to recover the riparian zone function as before land conversion into oil palm. There will be no chemical application in the riparian areas and only manual keeping activities will be applied. Components of the remediation plan shall include management and monitoring of threats and the vegetation and river water conditions as shall be defined in updated SOPs.

The peatland area remediation plan will involve delineation of peatland areas in concessions; water management and monitoring of the water table; prohibitions, restrictions and conservation activities in peatland areas. Through implementation of the management plan, we aim to maintain water levels and carbon stock and mitigate the negative impacts that can result from the cultivation of oil palm on peat. Implementation will be guided by soil assessment reports and RSPO according to the latest RSPO Manual on Best Management Practices for Existing Oil Palm Cultivation on Peat (2019).

Monitoring and evaluation of all remediation activities will be conducted using measurable indicators to determine impact and effectiveness of the program and to guide adaptive management decisions.

4.6. Summary of Management Plan for the Mitigation of GHG Emissions

A management plan will be implemented to minimize further greenhouse emissions. As recommended in the assessment report, the management steps will include:

1. Periodic monitoring of carbon stocks / greenhouse gas emissions to monitor changes against baseline data.
2. Regulated use of fertilizers and pesticides, monitoring and optimizing the type and dose of fertilizer used.
3. Management and monitoring of conservation areas to maintain and enhance carbon stocks:
 - a. Management of peat conservation areas and fire prevention in peat areas.

- b. Rehabilitation of degraded riparian zones / HCV areas.
 - c. Monitoring and maintaining forested areas from disturbances (especially illegal logging).
4. Implementation of a peatland / water management and monitoring system for areas planted on peat.

Table 44. The Summary of PT. SAP GHG Emission Management and Mitigation Plan

Source of Emissions	Mitigation Approaches	Monitoring Plan	PIC	Time Plan
Land Clearing and Planting (Land Use Change)	<ul style="list-style-type: none"> • Adopted Zero Burning Land Clearing methods • Adopted and Comply with Procedure and Documentation Required for New Planting in Indonesian Regulation (EIA/AMDAL) and Other Standards (RSPO, ISPO, etc.) • No Land Clearing in areas that identified as HCV/HCS area • Keep the HCV/HCS area as Carbon Stock /sequestration. • Socialization to employees and communities related with conservation and Green House Gas Mitigation programme 	Data collecting and reporting based on activities	EHS Dept and Plantation Dept	Annually
Heavy equipment for Land Clearing	<ul style="list-style-type: none"> • Routine Maintenance heavy equipment • Regularly emission test on heavy equipment • Socialization the impact of Green House Gas Emission to the worker 	Data collecting and report of emission source in operational activity	Plantation Dept and EHS Dept	Annually
Degradation of forest	<ul style="list-style-type: none"> • Rehabilitation of degraded HCV areas including riparian areas. • Routine inspection and patrol to avoid disturbance (especially illegal logging and fires) in forested areas, especially peatland. • 3. Socialization on forest and peatland conservation. 	Data collecting and reporting based on activities	EHS Departement and Plantation Dept	Annually

Source of Emissions	Mitigation Approaches	Monitoring Plan	PIC	Time Plan
Peatland subsidence (oil palm planted on peat soil)	<p>Management and monitoring according to the latest RSPO Manual on Best Management Practices for Existing Oil Palm Cultivation on Peat (2019) to minimize peat subsidence and associated greenhouse gas emissions.</p> <ul style="list-style-type: none"> Regulation of water flow: Main outlets are installed with water control structure (stop-offs or water gates) to regulate excess water flow to river preventing water from leaving the plantation during the dry months, mitigating the risk of over-drainage of the peat. Maintenance of vegetative ground cover is maintained as an approach to help reduce the drying of the peat surface and peatland oxidation. Monitoring of water management through the installation and use of water level gauge to measure water level in drainage systems and outlets and piezometers to measure the pressure of groundwater. Monitoring of peat subsidence through the installation and use of Subsidence poles. 	Data collecting and report of emission source	GRDC/Agronomist Agronomy and Plantation Dept	Annually
Fertilizer	<ul style="list-style-type: none"> Effective fertilizing based on dosages and recommendation from Agronomy Department Using EFB for mulching programme to reduce inorganic fertilizer usage No Fertilizing on Rainy Day No fertilizing on Riparian Zone Socialization to employee about Company's policy on Fertilizing 	Data collecting and report of emission source	Plantation Dept	Yearly
Pesticides	<ul style="list-style-type: none"> Actively monitor Pest-Diseases build-up and if so required Implement an effective control measures in order to minimize the potential loss of yield due to outbreak; Inspected all blocks first by plantation staff prior to spraying in order to enable appropriate selection of Herbicides and equipments to suit the field conditions; Seek advice from Agronomy Advisor for 	Data collecting and report of emission source in operational activity	Plantation Dept	Yearly

Source of Emissions	Mitigation Approaches	Monitoring Plan	PIC	Time Plan
	<p>the used of any new Herbicides that are constantly coming onto the market</p> <ul style="list-style-type: none"> Adopted in formulating desirable Pest-Disease control strategy and biological control agents: Introduction of Barn Owl, and adoption of appropriate weed management methods with beneficial plants. No chemical use in riparian areas Educate and awareness the worker regularly to implement good practices in chemical use activities 			
Transport (Harvesting and Maintenance)	<ul style="list-style-type: none"> Routine Maintenance for Transportation Regularly emission test on Transport Socialization the impact of Green House Gas Emission to the worker 	Data collecting and reporting based on activities	Plantation Dept	Annually
Housing Complex electricity	<ul style="list-style-type: none"> Energy conservation campaign. 	Monthly report	EHS Dept	Annually
Household waste to Landfill	<ul style="list-style-type: none"> Reduce, Reuse, Recycling Programs. 	Monthly report	Plantation Dept	Annually
Mill Power: Boiler and Generatorset (Genset) for electricity	<ul style="list-style-type: none"> Regularly conducted emission test in Boiler and Genset. Routine maintenance of boiler and genset. Using Shell and Fiber from FFB Process as a Fuel to reduce Fossil Fuel Use for Boiler. 	Data collecting and report of emission source in operational activity	Mill Operation Dept	Annually
POME (Palm Oil Mill Effluent)	<ul style="list-style-type: none"> Digested POME for Land Application to replace inorganic fertilizer (the location of application is around the Mill Location). 	Data collecting and report of emission source in operational activity	Mill Opretaion Dept	Annually

5. REFERENCES

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- Peatland Assessment: Peatland Assessment of PT Sariwana Adi Perkasa and PT Nabire Baru, dated July 2017. Conduct and prepared by PT Ekologika Consultants, Jakarta, Indonesia.
- RSPO GHG Assessment Procedure for New Development version 3, October 2016.
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- Social and Environmental Assessments (AMDAL) of PT Sariwana Adi Perkasa was finalized on 15th December 2014. Conduct and prepared by PT Widya Cipta Buana Consultant, Papua, Indonesia.
- Soils Suitability Report: "Soils of the PT Nabire Baru Estate" and "Soils of the PT Sariwana Adi Perkasa Estate". This semi-detailed soil survey and soil management groups and sub-groups assessment for oil palm plantation. Both prepared March 2017 by Carmiel Agrotech SDN BHD and Param Agricultural Soil Surveys (M) SDN. BHD.

6. INTERNAL RESPONSIBILITY

6.1. Acceptance of Interpretations

The content of this report summarizes the information in (i) Social Environment Impact Assessment (SEIA), (ii) High Conservation Value (HCV) Assessment, (iii) Land Use Change Analysis (LUCA) Assessment and (iv) High Carbon Stock (HCS) Assessment. The assessors confirm that the information in the reports has been accurately interpreted here in the NPP report.

Signed for and on behalf of PT Sariwana Adi Perkasa (Date: 30 October 2019)



Edi Suhardi
Sustainability Director

Signed for and on behalf of PT Ekologika Consultants (Date: 30 October 2019)



Nihil Jannah
PT Ekologika Consultants

Signed for and on behalf of PT Ata Marie (Date: 30 October 2019)



Alex Thon
Director

6.2. Acceptance of Responsibility

The outcomes of all assessment reports have been accepted by the Management of PT Sariwana Adi Perkasa and will be applied in developing and managing PT Sariwana Adi Perkasa as outlined in the management and monitoring plans presented in this report.

Management of PT Sariwana Adi Perkasa



Edi Suhardi
Sustainability Director