SUMMARY OF ASSESSMENT AND MANAGEMENT PLANS

Proposed New Plantings by Plasma PT Rimba Harapan Sakti,

Scheme Smallholder of Koperasi Makmur Sejahtera

Seruyan Regency, Central Kalimantan Province,

Indonesia

January 2022

List of Abbreviation

AGB : *Above ground biomass* (biomassa permukaan tanah)

ALS : *Assessor Licensing Scheme* (Skema Lisensi Penilai)

AOI : *Area of Interest* (Wilayah Kepentingan)

APL : Area Penggunaan Lain

BPD : Badan Permusyawaratan Desa

CITES : *Convention on International Trade in Endangered Species of Wild Fauna and Flora* (Konvensi Perdagangan Internasional Spesies Fauna dan Flora Liar yang Terancam)

CPCL : Calon Petani Calon Lahan

CR : *Critically Endangered*

DAS : Daerah Aliran Sungai

EMU : *Environmental Management Unit*

FGD *: Focus Group Discussion* (Diskusi Kelompok Terfokus)

Forina : Forum Orangutan Indonesia

GFW : *Global Forest Watch*

GRTT : Ganti Rugi Tanam Tumbuh

HCS : *High Carbon Stock* (Stok Karbon Tinggi – SKT)

HCSA : *High Carbon Stock Approach* (Pendekatan SKT)

HCV : *High Conservation Value* (Nilai Konservasi Tinggi – NKT)

HCVRN : *High Conservation Value Resource Network* (Jaringan sumber daya NKT)

HDF : *High Density Forest* (Hutan Kerapatan Tinggi – HK 3)

HK : Hutan Kerapatan

HP : Hutan Produksi

HPK : Hutan Produksi yang dapat dikonversi

HPP : *High Priority Patch* (Petak Prioritas Tinggi - PPT)

IBA : *Important Bird Area*

ICLUP : *Integrated Conservation and Land Use Plan* (Rencana Konservasi dan Penggunaan Lahan Terpadu)

IUCN : *International Union for Conservation of Nature*

KBKT : Kawasan Bernilai Konservasi Tinggi

KLHK : Kementerian Lingkungan Hidup dan Kehutanan

KMS : Koperasi Makmur Sejahtera

KPNKT : Kawasan Pengelolaan Nilai Konservasi Tinggi

LDF : *Low Density Forest* (Hutan Kerapatan Rendah - HK 1)

LiDAR : *Light Detection and Ranging* (Deteksi Cahaya dan Pengukuran Jarak/metode pengindraan jarak jauh)

LPM : Lembaga Pemberdayaan Masyarakat

LPMD : Lembaga Pemberdayaan Masyarakat Desa

LPP : *Low Priority Patch* (Petak Prioritas Rendah - PPR)

LSM : Lembaga Swadaya Masyarakat

LTS : *Land Tenure Study* (Studi Penguasaan Lahan)

MDF : *Medium Density Forest* (Hutan Kerapatan Sedang - HK 2)

MPP : *Medium Priority Patch* (Petak Prioritas Medium - PPM)

MOU : *Memorandum of Understanding* (Nota Kesepahaman)

NDPE : *No Deforestation, No Peat, No Exploitation* (Kebijakan pengembangan perkebunan kelapa sawit yang tidak membuka hutan, tidak membuka gambut dan juga tidak melakukan eksploitasi)

NPP : *New Planting Procedure*

OL : *Open Land* (LT - Lahan Terbuka)

OSS : *One Single Submission*

PADIATAPA : Persetujuan atas Dasar Informasi Awal dan Tanpa Paksaan (FPIC – *Free, Prior, and Informed, Concern*)

PADT : *Patch Analysis Decision Tree*

PKK : Pemberdayaan Kesehatan Keluarga

PM : *Participatory Mapping* (Pemetaan Partisipatif)

PRA : *Participatory Rural Appraisal*

RBA : *Rapid Biodiversity Assessment*

RePPProT : *Regional Physical Planning Programme for Transmigration*

RHS : Rimba Harapan Sakti

RSPO : *Roundtable Sustainable Palm Oil*

RTE : *Rare, Threatened, and Endangered*

RTRW : Rencana Tata Ruang Wilayah

SDA : Sumber Daya Alam

SEIA : *Social and Environmental Impact Assessment* (Kajian Dampak Sosial dan Lingkungan)

SIA : *Social Impact Assessment* (Kajian Dampak Sosial)

SIUP : Surat Izin Usaha Perdagangan

SK : Surat Keputusan

TDP : Tanda Daftar Perusahaan

UKL/UPL : Upaya Kelola Lingkungan/Upaya Pemantauan Lingkungan

USGS : *United States Geological Survey*

YRF : *Young Regenerating Forest* (Hutan Regenerasi Muda - HRM)

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1. Overview and Background

1.1. Overview

Scheme smallholder of Koperasi Makmur Sejahtera (KMS) is a smallholder under management of PT Rimba Harapan Sakti (RHS), a subsidiary of Wilmar International Limited (Wilmar). As a core element of our sustainability strategy for our upstream operations, Wilmar has joined Roundtable on Sustainable Palm Oil (RSPO) member since September 29th, 2004 with membership number 2-0017-05-000-00[1]. This scheme smallholder of KMS is located in Seruyan District, Kalimantan Tengah Province, Indonesia.

PT RHS has planned to develop scheme smallholder on behalf of Koperasi Makmur Sejahtera (KMS). In ensuring that all the process is comply with RSPO Principle and Criteria, the scheme smallholder KMS needs to be assessed through the new planting procedures (NPP) which required by the RSPO, prior land clearing activities. The proposed new planting of scheme smallholder are located adjacent with PT RHS (Figure 1). According to the RSPO Procedures for New Oil Palm Planting (RSPO NPP), this process will refer to the Guidance Document approved in November 20th, 2015.

Koperasi Makmur Sejahtera was established by Act No. 28 dated on 27 Juli 2009 issued by Notary Joni,SH,SP,N,MH,F,A and legalized by Ministry of Cooperative and SMEs of the Republic Indonesia No. 075/BH/XVIII.14/IDKUMKM/VIII/2009. The proposed project area is located between $2^0$50'50.43" S; $112^0$36"50.64" E and $2^0$49'47.03" S; $112^0$37"18.19" E. The scheme smallholder has obtained Principle Location Permit (Izin Prinsip Lokasi) by Regent of Seruyan No. 500/1787/EK/XI/2016 dated on 30 November 2016 for Plasma KMS with total area ± 224 Ha located in Pematang Limau Village, Seruyan Hilir District, Seruyan Regency, Kalimantan Tengah Province. In addition, the plasma has also obtained Location Permit (Ijin Lokasi) from Agency of OSS Management and Organizing dated 27 Juli 2017, and Plantation Business Permit (Ijin Usaha Perkebunan-IUP) on 12 October 2020 with the project number 201912-3112-3739-9029-533. There are 0.6 ha differences of the operational hectarage between legal document with the shapefile that was used for the spatial analysis of this NPP. The differences are not significant, and all the spatial process on this NPP is refer to the hectarage on the shapefile.

According to the Rencana Tata Ruang Wilayah Propinsi (RTRWP – Provincial Land use Plan) and forest designation from Kementerian Lingkungan Hidup dan Kehutanan (Ministry of Environmental and Forestry – MoEF), the proposed project area is located within Area Penggunaan Lain (APL), which can be used for palm oil plantation development (Figure 2 and Figure 3).

[1] https://rspo.org/members/88/Wilmar-International-Limited

Table 1. Information of the organization and contact person

Name of RSPO member	Wilmar International Limited
RSPO membership number	2-0017-05-000-00
Date of joining RSPO	16 August 2005
Name of subsidiary/management unit	PT Rimba Harapan Sakti – Scheme Smallholder Koperasi Makmur Sejahtera
Country of subsidiary/management unit	Indonesia
Province and district of subsidiary/management unit	Seruyan District, Kalimantan Tengah Province
Total area of management unit (ha)	224 ha
Address and Contact Person	Multivision Tower, 12th Floor Jl. Kuningan Mulia Kav.9-B Jakarta Selatan 12980 Group Estate Manager: Isnawan Haryoko Email : isnawan.haryoko@id.wilmar-intl.com
Geographical Location	$2^0$50'50.43" S; 112^{0}36"50.64" E, and $2^0$49'47.03" S; 112^{0}37"18.19" E
Boundary of the plasma	North: PT Rimba Harapan Sakti East: Community farm South: Community farm West: PT Rimba Harapan Sakti

From a landscape perspective, the study area is included in the Seruyan District, which has a climate type category A, which is very wet with rainfall conditions in the lowest range of 2,300 mm/year and the highest reaching 4,300 mm/year. This indicates that the rainfall in this area is in the moderate to high category where the rain time is almost evenly distributed every month of the year. The average temperature in Seruyan District is around 20-32^0 C with an average relative humidity of 75%.

Hydrologically the location of KMS is in the Saka Baru River which is in the south of the location, and the Pukun River in the east. Based on data from the Center for Soil and Agroclimate Research (2000), the soil types in this area are included in the Entisols and Spodosol categories. From the distribution of soil types and the Indicative Map of Postponement of New Permits / Peta Indikatif Penundaan Pemberian Izin Baru (PIPPIB), it can also be seen that the KMS plasma area is not in the peat soil zone. Meanwhile, in terms of topography, almost the location of Plasma KMS is included in the flat slope with a slope class of 0-8 degrees and the entire area is in the lowland elevation zone (0-500m).

Assessors team confirmed that the required legal documents such as Permitted Area (Ijin Lokasi), Plantation Development Permit (Ijin Usaha Perkebunan) and required environmental and social study documents such as Usaha Kelola Lingkungan/Usaha Pantau Lingkungan (UKL/UPL or EIA) which is

included Rencana Kelola Lingkungan/Rencana Pantau Lingkungan (RKL/RPL), as well as other required documents SIA, soil & topography, LUCA, GHG and integrated HCV and HCS reports are available.

Integrated HCV and HCS assessment had been conducted in April 2019 by Wilmar Sustainability Team, covering all the 224.06 ha of the location permit[2]. The identified HCV was HCV 4 with total area of 1,60 ha, with no primary forest identified within the concession. The HCV and HCS report was led by license HCVRN assessor, who is qualified to conduct integrated HCV and HCS assessment[3].

KMS has also conducted semi detail soil survey covered all the concession area to identify soil suitability on January 2013. The soil assessment resulted no peat soil was identified.

The Social Environment Impact Assessment (SEIA/UKL - UPL) was approved by Dinas Lingkungan Hidup (DLH – Environmental Agency) of Seruyan Regency on 25 November 2019 with No. 660/454.1/DLH.II/XI/2019 and the Environmental Permit (Izin Lingkungan) was approved by the Regent of Seruyan Regency No. 503-H.A/01.001/DPMPTSP/I/2020, issued date on 24 January 2020[4]. This permit also containing approval for Environment management plan and monitoring plan (RKL-RPL) as a part of Environmental Feasibility of Oil Palm Plantation Development Plan.

In the process of Free Prior Informed Concerned (FPIC), particularly on the preparation of plantation development, KMS has commenced a program to socialize information to the local communities on the project and to receive feedback. The socialization and meeting was started since 27 January 2010 between village head, representatives of local villages, land owner within plasma area, and Wilmar team. Land ownership also has been identified through participatory mapping and compensation. Socialization, meeting and survey has been recorded, including list of attendees, topics discussed and issues raised. All of the process has been compiled on the FPIC report on 2018 and based on those report, all the area within the concession is clean and clear[5].

The GHG assessment was conducted during 2019-2021[6]. The aim was to identify sources of GHG emissions from planned land clearing and new land operations in KMS, to estimate net GHG emissions from planned land clearing and new land operations in KMS, to obtain the best alternative scenario for the plan for opening and operating new land in KMS in the context of GHG emission mitigation, as well as to set a Management Plan for GHG emission mitigation.

A study on land cover changes in the KMS plasma area was conducted in 2021 as part of the implementation of Wilmar's environmental commitment to support a natural resource management based

[2] https://hcvnetwork.org/reports/laporan-penilaian-nkt-dan-skt-terintegrasi-plasma-koperasi-makmur-sejahtera/
[3] https://hcvnetwork.org/assessors/syahrial-harahap/
[4] Laporan UKL-UPL Plasma KMS, 2019
[5] Laporan Studi Penguasaan Lahan (*Land Tenure Study*), 2018
[6] Laporan Kajian Gas Rumah Kaca Untuk Penanaman Baru Koperasi Makmur Sejahtera, 2021

on the principle of environmental sustainability. This study is expected to provide information on changes in land cover in the KMS plasma area from 2005 to 2021[7].

As the conclusion from all of those reports, the proposed new planting area is located within the APL, outside the HCV-HCS area, and no fragile soil nor peat soil within the location permit. With all the processes, this scheme smallholder is ready to implement the recommended management plan as specified in the UKL – UPL, SIA, GHG and Integrated HCV and HCS reports.

1.2. New Development Plan

In accordance with the operational management data, from the 224.06 ha of the spatial data from location permit shapefile, the total estimated new planting area is approximately 222.46 ha, with 1.60 ha of conservation area (Figure 4). All potential development area will be functioned for scheme smallholders in order to contribute some income for the community and to maintain harmonious relationship with the local community. The development of plasma plantation in partnership program as stated in document "Perjanjian Kerjasama Kemitraan" dated on 7 November 2017. The proposed area will be opened for oil palm plantations in 2022, with the potential area for new planting is 222.46 hectares. This figure of new planting area is based on results from Integrated HCV and HCS, SIA, and FPIC studies.

[7] Laporan Perubahan Tutupan Lahan Plasma KMS, 2019

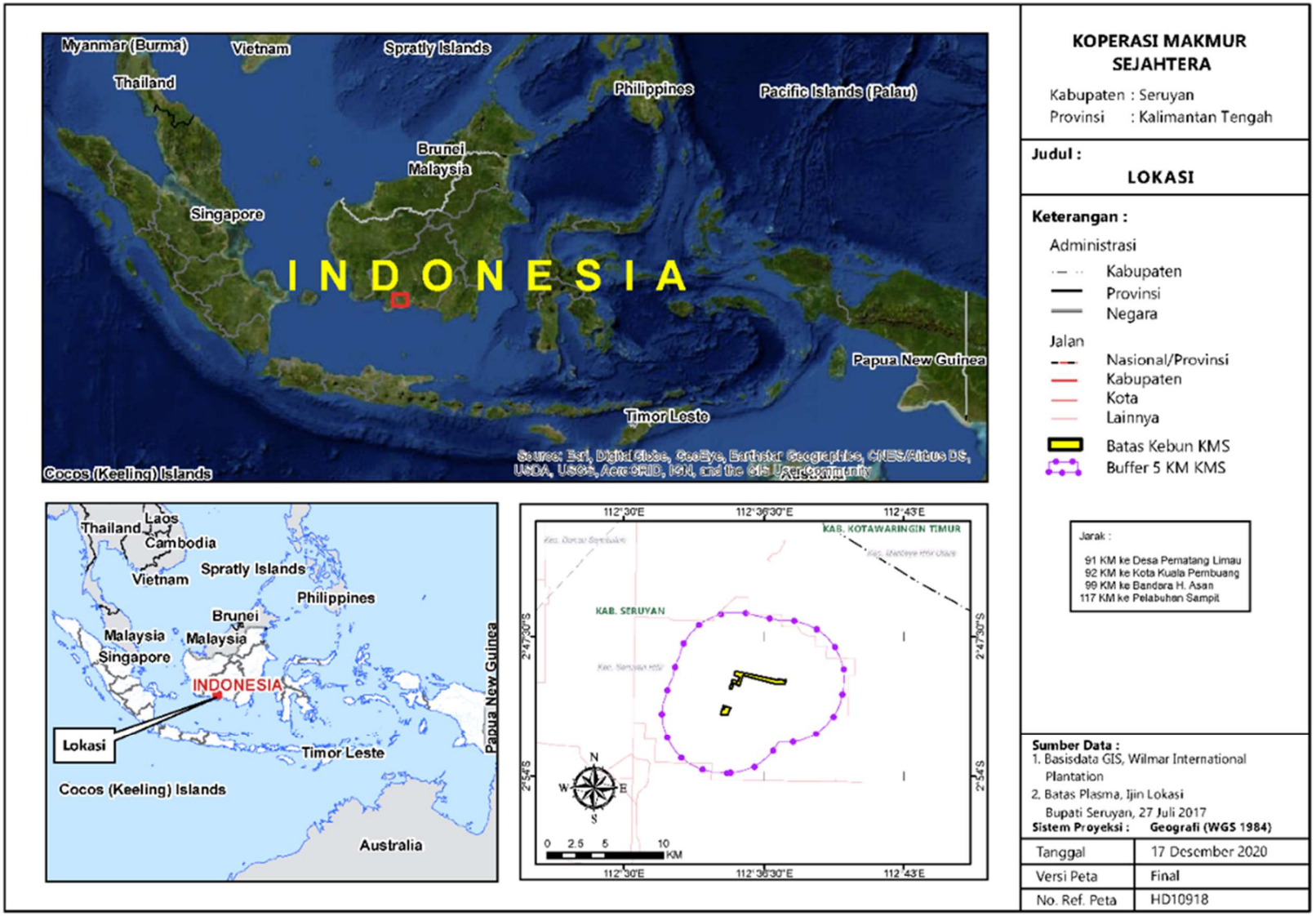


Figure 1. Location Area

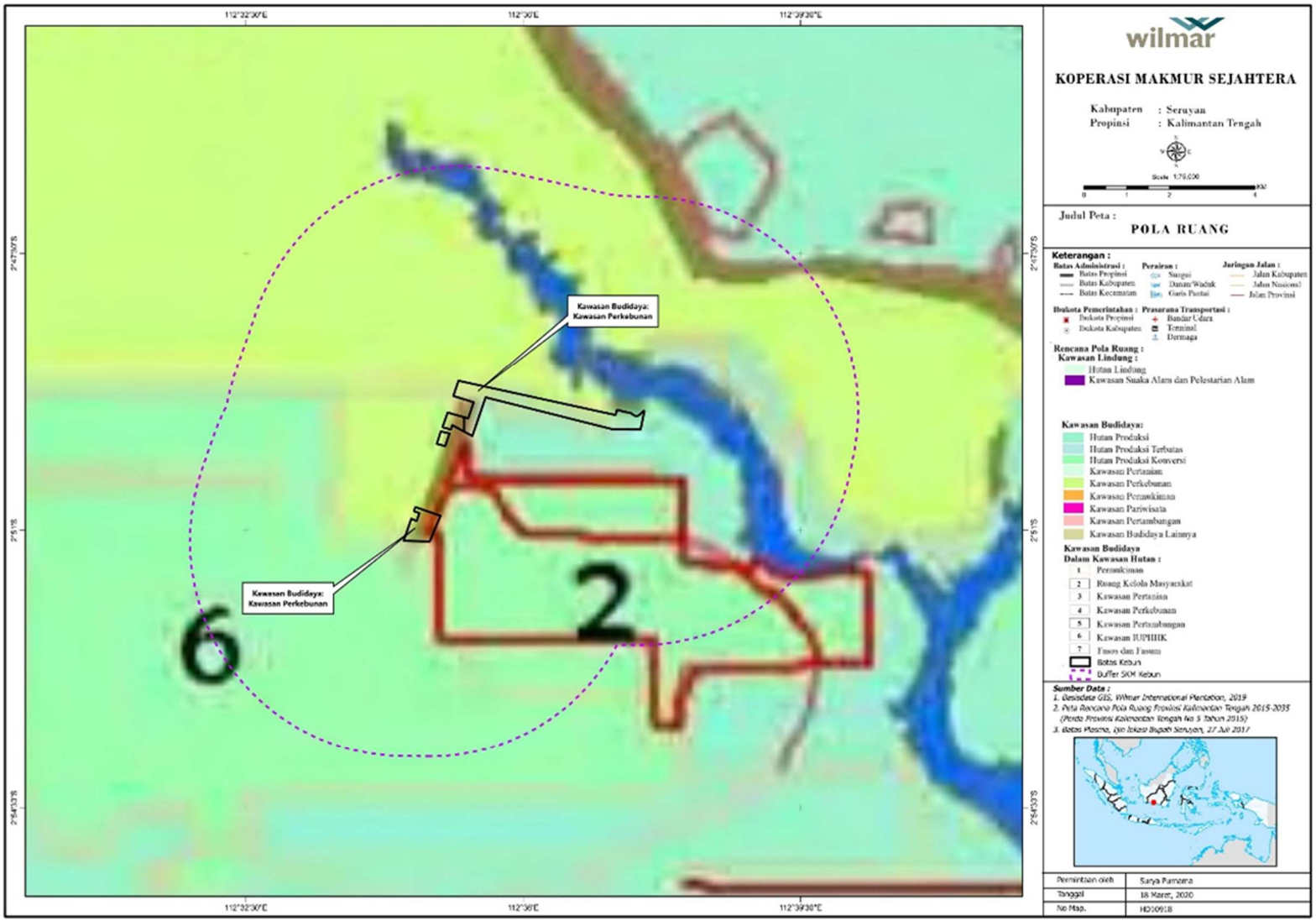


Figure 2. Proposed New Planting Area in Provincial Land Use Plan

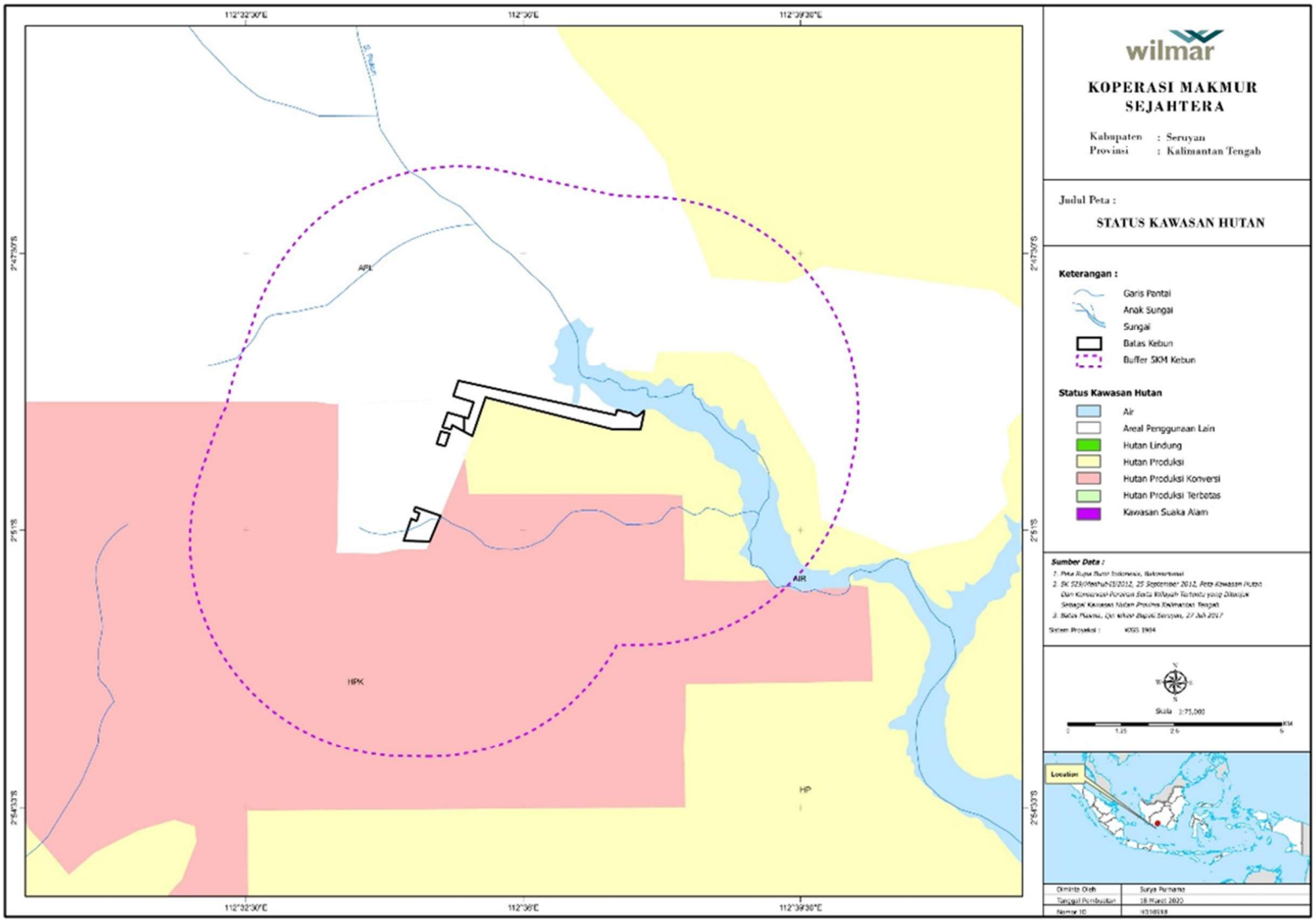
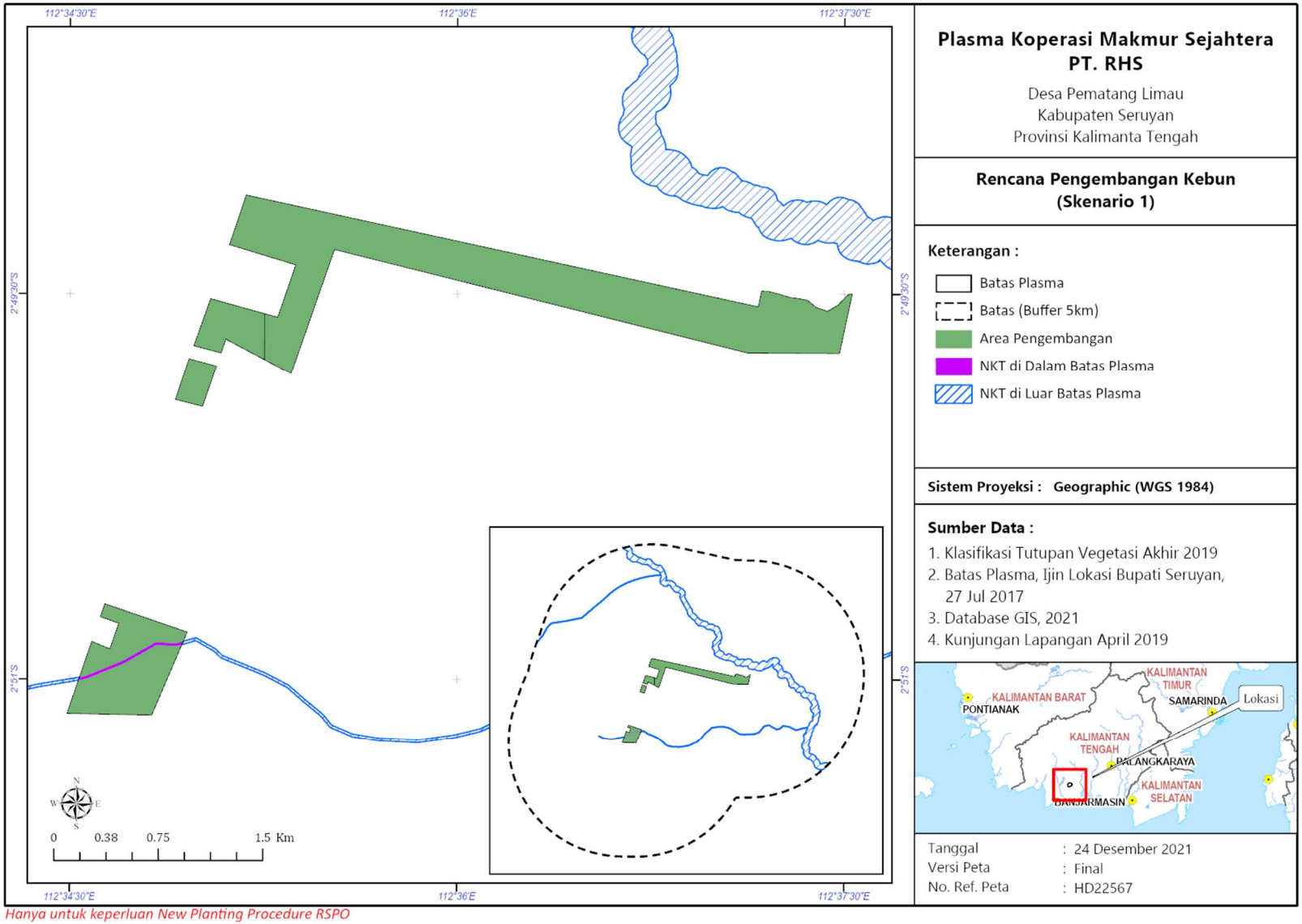


Figure 3. Proposed New Planting Area in Forest Designation of MoEF



Hanya untuk keperluan New Planting Procedure RSPO

Figure 4. New Development Plan of KMS

2. Assessment Process and Method

2.1. Social and Environmental Impact Assessment (SEIA)

2.1.1. Date of Assessment

The social and environmental impact assessments (SEIA) in plasma KMS is comprised of environmental impact assessment (for area smaller than 3,000 ha and located in medium or low risk area, it is known as Usaha Kelola dan Usaha Pantau Lingkungan or UKL – UPL) and Social Impact Assessment. EIA was conducted and finalized in 2019, while SIA was first conducted in 2017 and then reviewed in 2020. Thus, both of the assessments is used as the reference for this NPP.

Table 2. Timeframe of Social Impact Assessment

No	Activity	Timeframe
1.	Preparation and equipment: 1. Team building and method consolidation evaluation. 2. Submission of Proposals to Management. 3. Secondary data collection. 4. Coordination of FGD preparation time with all Cooperative.	25 – 30 September 2017
2.	FGD and visits to Cooperative: Koperasi Makmur Sejahtera Pematang Limau Village	09 - 30 October 2017
3.	Interview with Avalis team	01 November 2017
4.	Report writing	02 – 14 November 2017
5.	Socialization and approval for social impact management & monitoring plan for all Cooperative.	14 – 16 November 2017

The SIA assessment was reviewed on 08-09 June 2020 since the SIA report had been 3 years to update any changes made on society.

2.1.2. SEIA Assessors

The EIA was conducted by CV. Green Mentaya Environtmental Consultant, who had qualification to conduct the study, and also has recognized by government. The team is comprised from the multiple experts on agriculture, forestry, biology, socio-economics and public health. The SIA was carried out by internal Wilmar Social team, who also experienced and trained to conduct the assessment. The details of SIA assessors are presented on Table 3 below.

Table 3. SEIA Assessor Team

Name	Certified	Position	Relevant Expertise
Yulian Mara Alkusma, S.Hut., M. Si	AMDAL A & B, Auditor	Team Lead UKL UPL	Environmental Management, Spatial, and Forestry
Ir. Muhammad Wahyudin, M.Si.	AMDAL A, B, C, Auditor	Team Member UKL UPL	Environmental Management
Ir. H. Hermansyah, M.Si	AMDAL A, B	Team Member UKL UPL	Biology
Drs. Guldani	AMDAL A	Team Member UKL UPL	Social and culture
Riko Ijami, SKM, M.Kes	AMDAL A, B, C. Auditor	Team Member UKL UPL	Public health
Kukuh Setiadi, ST	AMDAL A	Team Member UKL UPL	Air quality
Laksamana Reza Saputra, ST	Kualitas Udara dan K-3 Lingkungan	Team Member UKL UPL	Air quality and emission expert
Yudi Khairiawan, ST	AMDAL A	Team Member UKL UPL	Industry
Rija Rianto, SE	AMDAL A	Team Member UKL UPL	Social and economy
Jery New Year Sandy	AMDAL A	Team Member UKL UPL	Social and economy
Social Impact Assessment Team			
Iskandar Zulkarnain	SIA expert	Team Coordinator SIA	Social and Community Development
Asep Marpu	-	Team Member SIA	Social and Community Development
Fajar Asianoor	HR expert	Team Member SIA	Human Resources
Ferdinand Lirrey	EHS expert	Team Member SIA	Environment, Health & Safety

Roy Sianturi	EHS expert	Team Member SIA	Environment, Health & Safety
Roni Susanto	EHS expert	Team Member SIA	Environment, Health & Safety

2.1.3. SEIA Method

A. EIA Method

Data collection in EIA was carried out with a set of environmental and social surveys according to the assessment parameters (i.e. Geo-physical-chemical, biology, cultural socioeconomic, and community health) and predictions of environmental condition in each phase of company's operational activities (i.e. pre-construction, construction, operation, and post operation).

Descriptive and quantitative analysis were used in the analysis of EIA. Result of the analysis was compiled in a matrix to present impact classification from each operational activity based on source of impact, kind of impact, remark of the impact (positive vs negative), and efforts of management and monitoring of each impact.

B. SIA Method

The scope of SIA covers the local social entities within the location permit area. It is also expanded into Pematang Limau village and other areas which considerably important to the proposed surrounding scheme smallholder area.

As the requirements of RSPO P&C NPP on the SIA must be carried out before the operational activities of the company begin. The method used in the assessment is rapid assessment through a qualitative approach to selected informants, and the information retrieval process is carried out in a *Focus Group Discussion* (FGD). This method was developed by Lokanath (2016). The social assessment method was chosen in order to be participatory and representative of the social group and in accordance with the principles of FPIC as suggested in the Guidelines.

Framework approach was used to identify the existing condition in scheme smallholder area especially the sosio-economic condition, the socio-economic impacts to local communities, the community's perception and expectation. Based on the existing condition, a SEIA document and social management plan is prepared to create ideal condition derived from community's expectation.

Description of each step on the social assessment are described below:

1. **Interviews** as well as in-depth interviews with community members who are deemed to have the necessary information (Village Head, Badan Permusyawarahan Desa/BPD Chair, Lembaga Pengembangan Masyarakat Desa/LPMD Chair, Rukun Warga/RW Chair, Rukun Tetangga/RT Head, community leaders, religious leaders, leaders of local institutions, and others).
2. **Focus group discussion** with community groups. The FGD participants consisted of the Village Head, BPD Management, LPMD, Cooperative, RW/RT heads, representatives of youth leaders, representatives of religious figures, representatives of women leaders, and representatives of other community leaders.
3. **Observation** of the conditions of the physical environment, social environment, social relations, matching the initial land cover map with actual conditions in the field, local community habits such as land use patterns and Natural Resources or Forest Resources.
4. **Data triangulation**. Every information result then checked about the validity by *Triangulation Methods.* This is integrated method to mutually verify issues, opinions, and ideas that arise, such as the emergence of new norms and rules regarding land use, and natural resource management that apply in local communities.

Sampling Technique used were *purposive sampling*, as the researchers chooses the sample based on who they think would be appropriate for the study and *simple random sampling* which is selected so that all samples of the same size have an equal chance of being selected from the entire population. Sample size determination concerning the representativeness of population based on characteristic of population. *Purposive sampling* is used to determine the village sample whilst *simple random sampling* is used to determine the selected respondents in village sample. The determination of village sample based on administrative area coverage of the village, characteristic of local communities, accessibility, social vulnerability and feedback from Koperasi Makmur Sejahtera lead and member. Both secondary data and primary data were analyzed with *quantitative methods* and *qualitative methods* and validated by triangulation techniques or cross examination that facilitates validation of data through cross verification from more than two methods to increase the credibility and validity of the results. The secondary data source is "*Kecamatan Seruyan Hilir dalam Angka, 2018*".

2.2. Integrated HCV – HCS Assessment Process and Method

2.2.1. Team Assessor and Their Credential

The assessor team composition consists of a lead assessor, experts on biodiversity, social, mapping (GIS), forestry, surveyors, and local species identifiers. This assessment has been conducted by Sustainability-Wilmar team including the 'HCV-HCS assessor provisional license', and the HCSA-registered GIS experts ('HCSA-registered GIS experts). Detail of the assessment team are presented on Table 4, Table 5, and Table 6 below.

Table 4. HCV and HCS Assessor Team

Name	Role	Institution	Relevant Expertise
Syahrial Anhar Harahap **ALS license ALS17003SH**[8] **HCSA Registered Practicioners**[9]	Lead Assessor	Wilmar International Plantation	Conservation Ecology
Tri Haryo Sagoro **HCSA Registered Practicioners**[9]	GIS and remote sensing expert	Wilmar International Plantation	GIS

Table 5. Expert Team Member and Qualifications

Name	Role	Institution (if relevant)	Relevant Expertise
Moch. Dasrial[9]	Forestry Analyst	Wilmar International Plantation	Forest Ecology
Ami Priyani	GIS – HCV Analyst	Wilmar International Plantation	GIS
Rusli Awaluddin	GIS – HCS Analyst	Wilmar International Plantation	GIS
Astriyanti	GIS – HCV Analyst	Wilmar International Plantation	GIS
Surya Purnama	Environmental and Carbon Expert	Wilmar International Plantation	Ornithology, Biodiversity, Carbon Specialist
Iskandar Zulkarnain	Social Expert	Wilmar International Plantation	Social, Community Empowerment

[8] https://hcvnetwork.org/assessors/syahrial-harahap/
[9] http://highcarbonstock.org/hcs-approach-quality-review-process/hcs-approach-registered-organisations/

Table 6. Forest Inventory Team

Name	Position
Hairul Fatah[9]	Inventory team leader
Apriansyah, Amir, Mades Nehang, Hari Setiyono	Tree species identification
Dony Rahmansyah, Hari Setiyono	Tree measurement assistant
Ambeng, Amir, Natarcia Maudobe	Transect line maker
Dedy Syafrianto, Hairul Fatah	Hip chain measuring instrument operator
Dedy Syafrianto, Pajar Hariadi	Compass officer
Natercia Maudobe, Apriansyah	Land Pacer

2.2.2. Timeframe

The assessment was carried out from April to October 2019. Referring to the HCV and HCS assessment manual, there were four key phase on this assessment, including (1) preliminary assessment, (2) scoping study, (3) main assessment, and (4) post-assessment process. Summary and timeline for each phase is presented on the Table 7 below.

Table 7. Assessment Timeline

Activity	Timeline
Pre Assessment Stage: a. Initial communication of the HCV and HCS study b. Initial FPIC, social mapping c. Land tenure study, participatory mapping, and Social Impact Assessment d. Initial landcover analysis and desk study	a. 17 Oktober 2016 b. 19 Desember 2016 – 11 Oktober 2018 c. 25 September – 16 November 2018 dan 8 – 9 Juni 2020 d. Februari – April 2019
Initial and scoping study a. Collecting primary and secondary data (social and environment) b. Conduct rapid assessment (document review and field checking) c. FPIC, Consultation and discussion with local community (including to get full assessment approval from community)	a. 1- 5 April 2019 b. 1- 5 April 2019 c. 8 April 2019

Full assessment a. HCV identification b. Forest inventory c. Social study (participatory mapping, FPIC, FGD)	8 – 12 April 2019
Data Analysis	April – Mei 2019
Map analysis and decision tree	April – Juli 2019
Rapid Biodiversity Assessment	17 – 22 Oktober 2019
Draft report	Agustus – Oktober 2019
Threat analysis and recommendation	Oktober 2019
ICLUP discussion and public consultation	15 Januari 2020
Development of management and monitoring recommendation	15 Januari 2020
Revise the report	Februari – Maret 2020
Submission to HCVN	30 April 2021
1st resubmission	30 November 2021
2nd resubmission	15 March 2022

2.2.3. HCV – HCS Assessment Method

The HCV and HCS assessment uses five main guidance, which are (1) Common Guidance for the Identification of High Conservation Value (Brown, et al., 2013; amended on Sept 2017)[10], (2) HCV Assessment Manual (HCVRN, 2014; updated on March 2019)[11], (3) HCV and HCS Assessment Manual (HCVRN, 2017)[12], (4) Common Guidance for Management and Monitoring of HCV (HCVRN, 2014; amended April 2018)[13], and The HCS Approach Toolkit version 2 (HCSA, 2017)[14]. Detail of the methods for each activity is presented on the Table 8 below.

[10] https://hcvnetwork.org/wp-content/uploads/2018/03/HCVCommonGuide_English.pdf
[11] https://hcvnetwork.org/wp-content/uploads/2019/03/HCV-Assessment-Manual-2019.pdf
[12] https://hcvnetwork.org/wp-content/uploads/2018/05/HCV_HCSA_Manual_Final_Eng.pdf
[13] https://hcvnetwork.org/wp-content/uploads/2018/04/HCV_Mgmt_Monitoring_final_english.pdf
[14] http://highcarbonstock.org/the-hcs-approach-toolkit/

Table 8. HCV-HCS Assessment Method

Activity	Method
Pre-assessment study	
1. Data collection	Data has been collected through online searching from several websites, library, and interview with relevant stakeholders, such as management of plasma and PT RHS, and local government.
2. FPIC	The FPIC process was conducted through Focus Group Discussion (Lokanath, 2016), and also personal interview with key person such as Head of village (Kepala Desa), Head of Cooperative, Local community leader (Ketua Adat, Tokoh Agama, Tokoh Perempuan, Tokoh Pemuda)
3. Preliminary analysis	a. On non-spatial data, assessor team was compared baseline data, which gathered during the pre-assessment, with minimum data requirement from HCV and HCS assessment manual. b. On spatial data, there was two imagery analysis as the baseline data: (1) Land cover change analysis between 2015 – 2019, and (2) initial land cover stratification to identify potential HCS area. Those imagery analysis has been carried out through manual and visual interpretation, and corrected through the geometric, radiometric and topographic processes. The classification of the land cover area was referring to HCSA Toolkit ver. 2 (HCSA, 2017), which are *Forest, Regenerating Forest, Shrub, Open Land, Agriculture Estate,* and *Other Land Cover.*
Scoping study	
1. Field verification of environmental aspect	The assessor has visited points that has been identified in the preliminary study. At each point, the team conducted field observations and made a descriptive analysis to compare the field conditions with the results of the previous analysis. Elements that was observed including biodiversity, soil, land cover, topography, and contour.
2. Social and FPIC	The social and FPIC process was conducted through Focus Group Discussion (Lokanath, 2016), and also personal interview with key person such as Head of village (Kepala Desa), Head of

	Cooperative, Local community leader (Ketua Adat, Tokoh Agama, Tokoh Perempuan, Tokoh Pemuda)
Full Assessment	
1. HCV social identification, including FPIC process	The method used in the assessment was rapid assessment through a qualitative approach to select informants, and the information retrieval process is carried out in a Focus Group Discussion (FGD), due to limitation of time for study (Lokanath, 2016). Through this FGD process, information about HCV can be gathered from specific people who well understand with the situation and familiar with their villages area. The social assessment method was chosen in order to be participatory and all the social group can be represented in accordance with the FPIC principles as suggested in the toolkit (HCVRN, 2013 and HCSA ver. 2, 2017). Summary method on social aspects are as follow: a. Interview with community b. Focus Group Discussion with community representatives c. Field observation in the village area, including within schemed-smallholder concession d. Triangulation data to crosscheck accuracy of the data and information, and e. Participatory mapping with the community The sampling technique used is purposive sampling and simple random sampling. Determination of sample size concerns the representativeness of the population based on population characteristics. Purposive sampling is used to determine the sample group in the community, while simple random sampling is used to determine the respondents selected in the community sample. Determination of the community sample based on the social structure in the local community which includes government institutions, social institutions, and professions or occupations. The secondary and primary data obtained will be analyzed by quantitative and qualitative methods. The next step is to verify the data and analysis by using triangulation or cross-checking techniques using more than two methods to increase the credibility and accuracy of the results. The emphasis of data and information

	collection is focused on attributes or elements of social HCVs (HCV 5 & HCV 6) and land tenure. All of these social field activities were carried out in the Pematang Limau Village area, including the Village Office, the Pematang Limau Village meeting building, and residents' houses.
2. HCV environment identification	The integrated HCV and HCS assessment are carried out by combine method, including recce walk (mamalia and herpetofauna), point count (birds), and forest plot inventory (vegetation and carbon). The assessment team also conducted interviews with the local community. Interviews were carried out with residents who often have activities in the river or forest area. a. **Mamals and herpetofauna** survey were carried out using Reconnaissance survey (Recce Walk). Recce walk technique was conducted in an exploration way such as local community path for logging or harvesting. Parameters recorded including species, geographic coordinate, individual observed, activity, sex, distance from observer, and land cover condition. Any observation on animal signs was also collected or recorded to the closest known taxonomy class. Team also collecting potential threat both for species and habitat. b. The **bird surveys** were gathered using the Visual point count method (VPC) (making circles 50m in diameter, placed along a 500m line with distance of 100m between each plot). The data collected includes the type and number of individual birds recorded within 15 minutes of observation at each plot. c. The **herpetofauna** survey was conducted using the reconnaissance walk (Recce Walk) method at a distance of 20 meters to the left and 20 meters to the right from the survey line. Herpetofauna survey was carried out by examining tree holes and roots, puddles and ponds, litter and rocks. The distinctive footprints and tail drag, remnants of snake skin molting and vocalizations can be used to identify the types of Herpetofauna that are not found directly. The species found were counted, photographed, recorded their habitat characteristics and identified.

3. HCS analysis	a. **Vegetation data** were collected following HCSA Toolkit version 2 (2017) methodology by using circular nested-sampling plots. Two circular plots sizes were used for different types of vegetation growth based on the Diameter Breast Height (DBH). Large plot with 13 m radius was used for trees with DBH>15 cm, and sub-plot with 6 m radius was used for trees with DBH between 5 cm and 15 cm. In each sub-plots, recorded parameters are tree species, DBH, and tree height. The coordinates of the sampling plots were recorded using GPS at the plot's center. b. For **biomass calculation**, two steps were incorporated in estimating the above-ground biomass in this study, including (1) determine the tree dimension and characteristics (DBH, total height, and wood density), and (2) select appropriate and validated allometric equation. According to the topographic and soil type of the area, we are using two allometric aquation for carbon calculation, which are Basuki (2009) for dry land forest, and Manuri (2014) for wetland forest and peat. The carbon results from DBH calculation need to be multiplied with 0.47, because IPCC (2006) states that woody biomass is composed of 47% carbon. c. **Statistic**, the HCSA Toolkit (2017) requested that an ANOVA test should be applied to determine whether there are significant differences in the carbon estimates per class, and that a Scheffe pairwise multiple comparisons test should also be used to determine which groups are significantly different. Statistically, there are pre-requisite before one can use ANOVA test, namely: (1) The samples must be random; (2) The samples must be independent to each other; (3) The populations must be normally distributed; (4) The populations must have the same variance. As the ANOVA test is a requirement from the HCSA Toolkit, then the assessors followed the toolkit, assuming all the pre-requisites are fulfilled. d. **Patch Analysis Decision Tree (PADT)** are a spatial approach, which considering size and connectivity of each patch. The size of forest patch is important to determine the presence of a core zone with a buffer width of 100 meters from the edge of patch.

	From this analysis, we can categorize the patch in to High, Medium, or Low priority of patch. Second key consideration on patch analysis is connectivity. This connectivity is used to identify of the distance between HCS patches, level of risk and threat (roads, rivers, housing), and connectivity with other potential HCS patch within a 5 km from concession boundary. In refer to the core and connectivity analysis, assessor can define next step of the PADT, as well as information to carry out further studies in particular patches or not, for example Pre-RBA or RBA activity.
4. Threat and potential threat assessment; and Management and Monitoring recommendation	Threat assessment activities was carried out through FGD method in discussions with community and plasma representatives. Threat identification is carried out qualitatively by considering positive and negative impact on the existence of the HCV and HCS area. The results of the threat assessment will then be used as the basis for the preparation of a management and monitoring plan for each HCS and HCV type. This threat assessment is referring to the 5 – S framework, which has been developed by The Nature Conservancy (2003). Approaches in the 5 –S framework are focused on: 1). System, 2). Stress, 3). Source of Stress (Stressor), 4). Strategy, and 5) Success.
5. Integrated Conservation Land use Plan (ICLUP)	The ICLUP process was carried out through FGD process with community and plasma representatives. The assessor has provided map with indicative conserve and development area which has been taken from PADT. This activity has conducted together with final public consultation.

2.2.3.1. Satellite Imagery Analysis

Land cover analysis was carried out using a 10 m Sentinel 2A imagery, recorded on January 4, 2019 which was downloaded from the United States Geological Survey (USGS) online portal. The selection of imagery has been adjusted to the criteria given in the HCS Toolkit Ver. 2 (2017), which are the imagery used is less than one year, cloud cover is less than 5% and with a minimum spatial resolution of 10 m. To simplify the HCS analysis, several additional satellite imageries were used to show historical land cover, which are 10 m Sentinel 2A (26 December 2015, 08 February 2017, and 19 May 2017) and aerial photography in May 2017.

The images were then corrected on the geometric, radiometric, and topographic. When it was corrected, images were then analysed through onscreen digitization using the ArcGIS software for an initial land cover classification. This digitization process was based on several visual interpretation keys, such as colour, form, size, height, texture, pattern, position, and association with other objects. The land cover is classified into seven classes and will then be regrouped based on the HCS land cover class according to the HCS Toolkit ver.2 (2017).

Table 9 Initial stratification analysis

No	Land cover strata	Size (Ha)	Percentage (%)
1	Hutan Regenerasi Muda (Young Regeneration Forest)	26.54	11.85%
2	Belukar (Schrub)	78.97	35.25%
3	Lahan Terbuka (Open Land)	98.43	43.93%
4	Kebun Sawit (Oil Palm)	20.13	8.98%
Total		**224.07**	**100%**

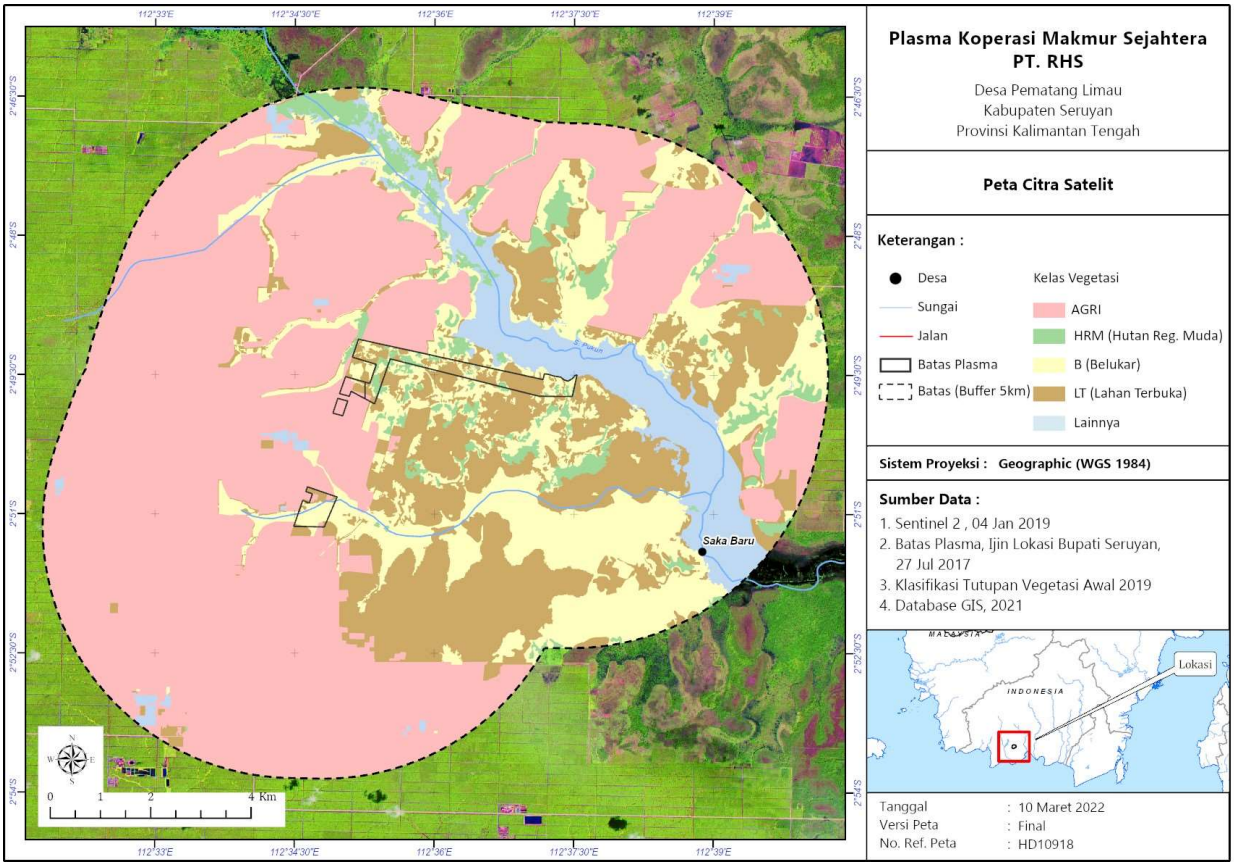


Figure 5 Map of Initial Stratification Analysis

Verification of satellite image interpretation result data into a particular classification results need to be analyzed to test the accuracy and precision of the results of classification. To verify the land cover data that has been generated, then we do the field verification on scoping study phase and field measurement on full assessment phase. Accuracy of the analysis was then calculated using Confussion Matrix, and re-interpretation based on the forest inventory. In field verification during the scoping study process, there was no significant difference between the results of the initial land cover analysis and the actual conditions in the field.

Table 10 Plot Sample Distribution

Strata	Land cover stratification	Size (Ha)	No. Sample
Strata 1	Hutan Regenerasi Muda (Regeneration Forest)	26.54	11
Strata 2	Belukar (Shrub)	78.97	9
Strata 3	Lahan Terbuka (Open Land)	98.43	13
Strata 4	Agri (Kebun Sawit Masyarakat)	20.13	0

Total	***224.07***	***33***

To determine the accuracy of the final land cover classification, an accuracy calculation is carried out using a confusion matrix. At this stage, plot sample data from field inventory results are used in calculating the final land cover classification accuracy and can be accepted if the accuracy value reaches 80%. Based on the results of the final land cover stratification analysis, an accuracy rate of 90.91% was obtained and the Kappa calculation statistic reached 89.44%.

Table 11 Confussion Matrix and Kappa Coefficient

Vegetation Cover		**Actual Class**			**Total**	***UA(User Accuracy)%***
		Shrub	**YRF**	**Open Land**		
Predicted Class	**Shrub**	7		2	***9***	***77.78***
	Young Regenerating Forest	1	10		***11***	***90.91***
	Open Land			13	***13***	***100.00***
Total		***8***	***10***	***15***	***33***	
PA (Producer's Accuracy) %		***87.50***	***100.00***	***86.67***		

2.2.3.2. Social Analysis Method

The method used in the assessment uses a rapid assessment through a qualitative approach to selected informants, and the information retrieval process is carried out in a Focus Group Discussion (FGD). This method was developed by Lokanath (2016). Through this FGD process, information about HCV can be gathered from specific people who well understand with the situation and familiar with their villages area. The social assessment method was chosen in order to be participatory and all the social group can be represented in accordance with the FPIC or PADIATAPA principles as suggested in the toolkit (HCVRN, 2013 and HCSA ver. 2, 2017).

The sampling technique used is purposive sampling and simple random sampling. Determination of sample size concerns the representativeness of the population based on population characteristics. Purposive sampling is used to determine the sample group in the community, while simple random sampling is used to determine the respondents selected in the community sample. Determination of the community sample based on the social structure

in the local community which includes government institutions, social institutions, and professions or occupations. The secondary and primary data obtained will be analyzed by quantitative and qualitative methods. The next step is to verify the data and analysis by using triangulation or cross-checking techniques using more than two methods to increase the credibility and accuracy of the results. The emphasis of data and information collection is focused on attributes or elements of social HCVs (HCV 5 & HCV 6) and land tenure. All of these social field activities were carried out in the Pematang Limau Village area, including the Village Office, the Pematang Limau Village meeting building, and residents' houses.

In the pre-assessment phase, scoping study and full assessments, in-depth interviews were conducted with company management at the head office and at field level as well as to local community. Literature review and maps which are relevant to the AOI were sourced from the library, internet and company documents. The literature that are used as references in this social analysis are as follows:

1. *Pedoman Penilaian NKT-SKT Dipakai pada saat Penilaian NKT-SKT Terpadu*. ID Dokumen: ALS_02_N Tanggal 08 November 2017.
2. *Common Guidance for the Identification of High Conservation Values: A good practice guide for identifying HCVs across different ecosystems and production systems*. 2017.
3. *Free, Prior and Informed Consent Guidef For RSPO Members,* RSPO Human Right Working Group 2015. Endorsed by the RSPO Board of Governors meeting on 20 November 2015 in Kuala Lumpur.
4. *United Nations Declaration on the Indigenous Peoples rights,* relating to FPIC (art. 32), Lands and Territories (art. 20 and article 26), immovability and the right to restitution and rectification / compensation (art. 10, art. 28), Representation (art. 18, art. 19), Agreement based on custom (article 3, article 4, article 5, article 33, and article 34).
5. Social Impact Assessment report, 2017 and re-asessment SIA report 2020 by PT RHS.
6. Land Tenure Study (LTS) report, 2018
7. Secondary data from library, such as:
    a. Vilages profile around area of interest
    b. *Kecamatan Seruyan Hilir dalam Angka* 2018
    c. *Kabupaten Seruyan dalam Angka* 2018

Table 12. List of participants on scoping study

Stakeholders	Number of People	
	Man	Woman
PT RHS Managemenet	7	
Village Head	1	
BPD	1	1
KMS Management	1	1
Village government staff	1	3
Woman Figure		1
Community Figure	11	3
Sub-district Government	1	
Total	**23**	**9**

Table 13. List of participants on Full Assessment

Stakeholders	Number of People	
	Man	Woman
PT RHS Management	2	
Village Head	1	
BPD	1	
KMS Management	3	1
Village Secretary	1	
Village government staff	2	
Customary Figure	2	
Woman Figure		4
Community Figure	2	1
Youth representative	2	
Housewife representative		2
Community representative	5	
Total	**19**	**8**

Table 14. List of participants on public consultation and ICLUP development

Stakeholders	Number of People	
	Man	Woman

PT RHS Management	1	1
Assesor team	2	
KMS Management	3	2
Community representatives	8	3
NGO	2	
Village government	2	
Sub-district Government	1	
Total	**19**	**6**

2.2.3.3. Environmental Methods

The HCV and HCS assessment studies were conducted using a descriptive method through survey techniques of reconnaissance walk, point count, and circular sample plots of forest in each area representing each type of ecosystem / natural land cover. Inventory of the types of vegetation, mammals, herpetofauna and avifauna is carried out rapidly in each of these ecosystems for 5 (five) days. The field guide for the survey refers to several sources, namely:

1. Kalimantan Tengah Provincial Landuse Plan, 2015 – 2035.
2. Important Bird Area dari Birdlife International[15] (2016).
3. *Common Guidance for the Identification of High Conservation Values: A good practice guide for identifying HCVs across different ecosystems and production systems*. 2017.
4. HCS Toolkit Version 2, 2017.
5. IUCN redlist species version – 3, 2017.
6. RePPProt document from Transmigration Ministry, 1990.
7. Important Wetland Database from Ramsar, 2015.
8. Orangutan habitat distribution, Forina 2016.
9. Landcover map from Ministry of Environmental and Forestry, 2017.
10. Forest area designation map from Ministry of Environmental and Forestry, 2012.
11. Soil survey from Departemen Environmental Management Unit (EMU), 2016.
12. Appendix I, II, dan III Convention on International Trade in Endangered Species (CITES), 2019 (Updated in 22 Juni 2021)[16].

[15] http://datazone.birdlife.org/site/mapsearch
[16] https://cites.org/eng/app/appendices.php

13. *Peraturan Pemerintah Republik Indonesia Nomor 7 Tahun 1999 Tentang Pengawetan Jenis Tumbuhan Dan Satwa.*
14. *Peraturan Menteri Lingkungan Hidup Dan Kehutanan Republik Indonesia Nomor P.106/Menlhk/Setjen/Kum.1/12/2018 Tentang Perubahan Kedua Atas Peraturan Menteri Lingkungan Hidup Dan Kehutanan Nomor P.20/Menlhk/Setjen/Kum.1/6/2018 Tentang Jenis Tumbuhan Dan Satwa Yang Dilindungi.*

For supporting information, the assessment team conducted interviews with the local community. Interviews were carried out with residents who often have activities in the river or forest area, with main question was on the information on species of reptile, amphibious, bird, and mammal. The assessment methods of each taxa are different, it follows the behaviour and ecology of the animal's taxa. There are three taxa for fauna, and one vegetation surveys. Rapid method survey that was used to identify HCV 1 – 3 and HCS are described below:

a. **Mamals**. The study was conducted using the reconaissance walk method (H. Kuehl, 2008) and the analysis was carried out descriptively. The survey area follows the observation transect that has been made with a distance of 200 meters and a width of 20 meters on each side of each transect. Surveys of mammals are generally direct and indirect encounters, such as sounds, tracks, scratches or friction on tree trunks, feces or urine, prey residues, nests. The survey was conducted in the active time ranges diurnal (morning-evening) and nocturnal (evening - morning). The crepuscular time approach (morning 06.00 – 09.00 WIB & evening 16.00 – 18.00 WIB) is attempted as often as possible to increase the chance of encounter with the object of observation. Additional observations were also made to describe the condition of the habitat related to the quality of the area and the suitability or availability of carrying capacity of the habitat for HCV mammal species in the area, including potential disturbances or threats to the survival of mammal species around the observation area.

b. **Avifauna**. Bird observations were carried out using the point method (visual point count) following Bibby et al. (2000). In this method, the observer will create an observation transect line with a length of 500 meters to 1 kilometer depending on land cover conditions. The observation plot is a circle with a virtual line with a diameter of 50 meters. Observation distance of each midpoint of the plot is 100 meters. Observers will observe birds at the midpoint of the plot. The data collected includes the name of the bird species and the estimated number of birds found are recorded along with habitat information and other

information deemed important. Identification of bird species was carried out using the LIPI field guide series “Birds in Sumatra, Java, Bali and Kalimantan” compiled by MacKinnon et al. (1992). Taxonomy and naming of bird species are adapted to the Indonesian Bird List Vol. 2 published by the Indonesian Ornithologist's Union (IdOU). The status of protection is determined by the laws of the Republic of Indonesia, IUCN and CITES.

c. **Herpetofauna.** The herpetofauna survey was conducted using the reconnaissance walk (Recce Walk) method at a distance of 20 meters to the left and 20 meters to the right from the survey line. Herpetofauna survey was carried out by examining tree holes and roots, puddles and ponds, litter and rocks. The distinctive footprints and tail drag, remnants of snake skin molting and vocalizations can be used to identify the types of Herpetofauna that are not found directly. The species found were counted, photographed, recorded their habitat characteristics and identified. Species identification and nomenclature

   refer to the AmphibiaWeb[17] and The Reptile Database[18] sites. Supporting information was obtained by interview method. The focus of the question is what types are often found and hunted. Information recorded is only the species that are potentially present and in accordance with their habitat and distribution

d. **Vegetation and HCS inventory**. Vegetation data were collected following HCSA Toolkit version 2 (2017) methodology by using circular nested-sampling plots. Two circular plots sizes were used for different types of vegetation growth based on the Diameter Breast Height (DBH). Large plot with 13 m radius was used for trees with DBH>15 cm, and sub-plot with 6 m radius was used for trees with DBH between 5 cm and 15 cm. In each sub-plots, recorded parameters are tree species, DBH, and tree height. The coordinates of the sampling plots were recorded using GPS at the plot’s centre.

e. **Above Ground Biomass Calculation.** Two steps were incorporated in estimating the above-ground biomass in this study, including (1) determine the tree dimension and characteristics (DBH, total height, and wood density), and (2) select appropriate and validated allometric equation. According to the topographic and soil type of the area, we are using Basuki (2009) allometric aquation for carbon calculation

$$LnY(dry\ land\ forest) = -1.201 + 2.196\ LnD(dry\ land\ forest)$$

[17] https://amphibiaweb.org/

[18] http://www.reptile-database.org/

Y: biomassa; and D : diameter.

IPCC (2006) states that woody biomass is composed of 47% carbon. It means that carbon results from the DBH calculation need to be multiplied with 0.47.
Analysis of Variance (Anova) was applied to examine the difference in the weighted mean amount of carbon for all forest classes and the 90% significance level. This test requires homogeneity of the sample population and homogeneity test followed by the pairwise Scheffe multiple comparison test to determine significant differences between each forest stratum group.
Analysis of Variance (Anova) was applied to test the differences. The hypotheses for the ANOVA test are:

H_0 = There is no difference in the average of HK1, HRM, B and LT strata

H_1 = There is a difference in the average strata of HK1, HRM, B and LT

To draw conclusions, it is necessary to have the distribution value of F (value of Ftable) with the following conditions:

- significance at 0.1
- df between groups = number of variables - 1 = 3 - 1 = 2
- df within groups = number of data - number of variables = 40 - 3 = 37
- Ftable = 2.45

The decision criteria are:

- If $F_{count} > F_{table}$ then H_0 is rejected and accepts H_1
- If $F_{count} < F_{table}$ then H_0 is accepted and H_1 is rejected

The HCSA Toolkit (2017) requested that an ANOVA test should be applied to determine whether there are significant differences in the carbon estimates per class, and that a Scheffe pairwise multiple comparisons test should also be used to determine which groups are significantly different. Statistically, there are pre-requisite before one can use ANOVA test, namely: (1) The samples must be random; (2) The samples must be independent to each other; (3) The populations must be normally distributed; (4) The populations must have the same variance. As

the ANOVA test is a requirement from the HCSA Toolkit, then the assessors followed the toolkit, assuming all the pre-requisites are fulfilled.

A. Sample of HCS Forest Classification

- Biomass Analysis

The results of the analysis of the biomass in the KMS plasma shows that the carbon stock of the potential HCS class structure is below 35 tonsC/hectare (YRF about 25.31 tonsC/hectare). Meanwhile, in the non-HCS class, carbon stocks of 3.77 tonsC/hectare were found in the scrub strata and 1.12 tonsC/hectare in the Open Land strata. From the results of the analysis, it can be seen that the carbon stock in YRF is categorized as a low-carbon area, because it is still within the range of carbon stocks for the shrub class.

Table 14. Stock carbon estimation per vegetation class

Groups	Count	Sum	Mean	Variance	SS	Std Err	Low	Up
YRF	11	278.45	25.31	25.85	258.46	5.17	13.79	36.84
Scrub	9	33.91	3.77	7.28	58.25	0.59	2.41	5.13
Open land	12	13.40	1.12	1.81	19.90	2.14	-3.60	5.83

Table 15. *Anova*

Source of Variation	SS	df	MS	F hit	P-value	F crit
Between Groups	3875.08	2.00	1937.54	166.92	0.00	3.33
Within Groups	336.62	29.00	11.61			
Total	4211.70	31.00	135.86			

Conclusion

F Hit Anova > F Crit, then significantly different between strata.

Table 16. *Scheffe test*

Absolute Different (ABS)	
(a) HRM Vs Scrub	21.546

(b) HRM Vs Opened land	24.283
(c) Scrub Vs Opened land	2.737

Calculation results of Scheffe Test

Perbandingan	(X1-X2)^2	S2w((1/n1)+(1/n2))	F sceffe	Conclusion
(a) HRM Vs Belukar	464.2216	2.352987947	197.29	significant
(b) HRM Vs Lahan Terbuka	589.6611	2.029452104	290.55	significant
(c) Belukar Vs Lahan Terbuka	7.491903	2.264750899	3.31	significant

F Crit Scheffe: 1.663827249

* F Scheffe > F Crit Scheffe then significantly different.

Based on the results of field verification and carbon analysis, a re-stratification of land cover was carried out. This final stratification will be used as the basis for patch analysis and determining the HCS area through Patch Analysis and Decision Tree or PADT.

Details of each land cover class after re-stratification can be seen in the table below:

Table 17. Final land cover stratification area

Landcover Stratification	Initial Stratification (Ha)	% from Total Area	Final Stratification (Ha)	% from Total Area
Potential HCS Class:				
YRF	26.54	11.85	26.54	11,85
Sub-total	***26.54***	***11.85***	***26.54***	***11.85***
Non-HCS Class:				
Shrub	78.97	35.25	81.30	36.29
Open Land	98.43	43.93	96.10	42.89
Community Palm Oil	20.13	8.98	20.13	8.98
Sub-total	***197,53***	***88,15***	***197,53***	***88,15***
TOTAL	**224,07**	**100**	**224,07**	**100**

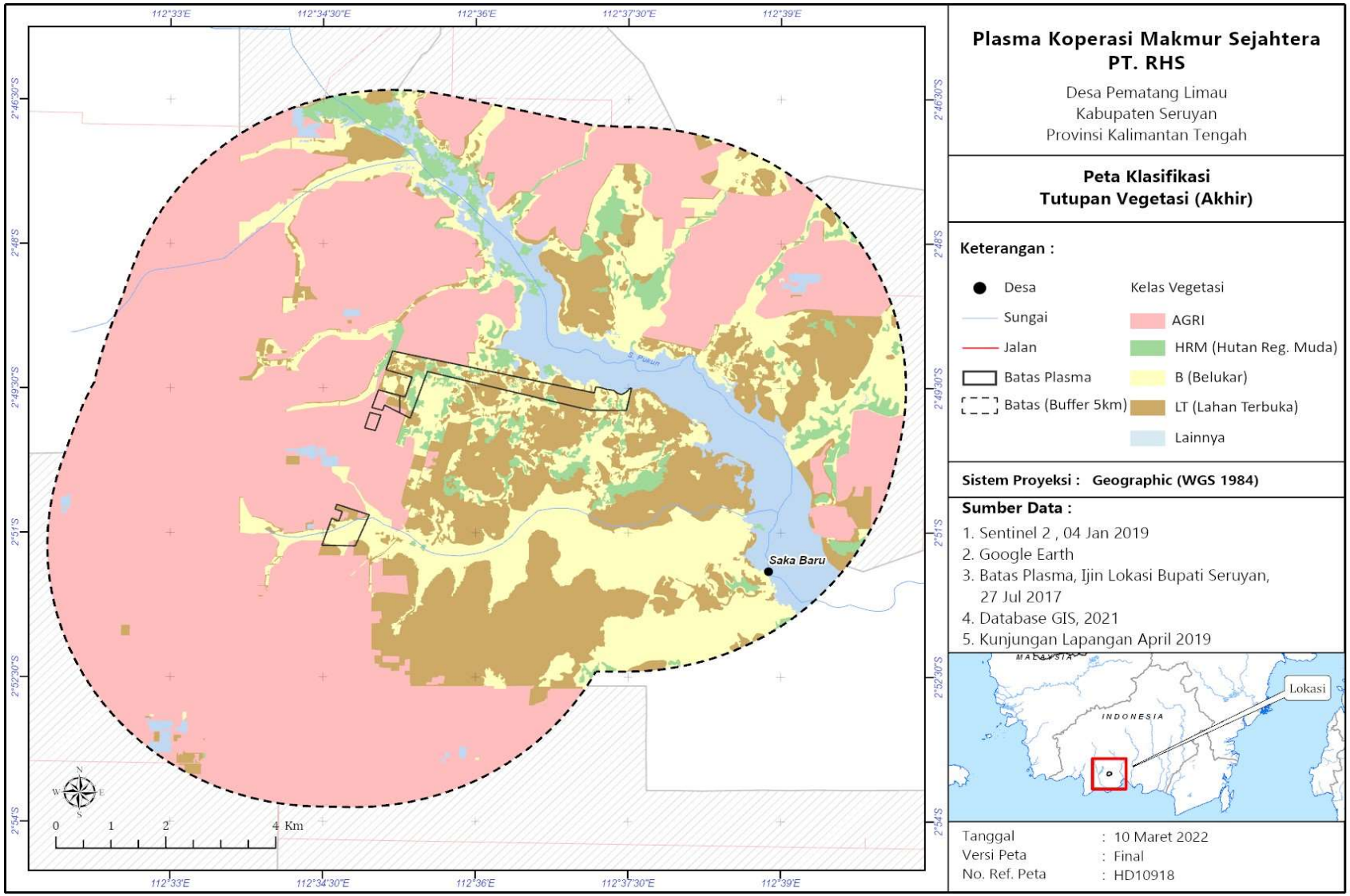


Figure 9. Final land cover restratification

2.2.3.5. Management and Monitoring Recommendations

The threat assessment was carried out using the Focus Group Discussion method in a joint discussion with community and company representatives on January 15, 2020. In this method, each participant will write down each threat based on the results of their interpretation, with reference to the assessment analysis that has been submitted previously. All notes from participants were then collected and discussed together in one forum. Determination of the level of risk is carried out with a qualitative approach to each proposed threat and then mutually agreed upon by all participants. The results of the threat assessment then form the basis for the preparation of a management and monitoring plan for each type of HCV that refers to the 5-S framework. The approach in the 5-S framework is focused on: 1). Systems, 2). Stress, 3). Source of Stress (Stressor), 4). Strategy, and 5) Success developed by The Nature Conservancy (2003). The discussion process is more directed at the types of threats that have occurred in the KMS Plasma area and also the community lands around the concession.

2.3. Soil and Topography Assessment

2.3.1. Soil Suitability Expert and Credential

The assessor team composition consists of a team coordinator and team expert on soil, environmental, HCV and GIS. This assessment has been conducted by Eco Management Unit (EMU)-Wilmar team in collaboration with Sustainability-Wilmar and GIS-Wilmar team. Detail of the assessment team are presented on Table 15 below:

Table 15. Soil Assessor Team

Name	Role	Institution (if relevant)	Relevant Expertise
Anung Rachmad	Team Coordinator	Eco Management Unit – Wilmar	Soil Expert
Eko Mukti Wibowo	Team Member	Eco Management Unit – Wilmar	Environmental Expert
Wawan Riyanto	Team Member	Eco Management Unit – Wilmar	Environmental Expert
Insan Taufik N	Team Member	Sustainability - Wilmar	HCV
Moch. Dasrial	Team Member	Sustainability - Wilmar	HCV
Maslan	Team Member	GIS –Wilmar	GIS

2.3.2. Soil Suitability Assessment Time & Method

The assessment was conducted in January 2016. The first step was determining the sampling location that represent the surveyed areal. After field checking, the thickness of organic material and soil sampling was collected. Soil samples for EMU laboratory testing was taken at a depth of 0 -50 cm and 50-100 cm at each location. Samples were collected using a 1.5m long soil drill. This tool is also used for measuring the thickness of the organic matter. Soil samples taken will be tested in the lab to calculate the percentage of organic matter and organic C content and soil texture.

In addition, on the survey also collected soil profile information in the sampling location area. Profile obtained if there is a trench or drainage and the condition of the surface area shows soil layer in the survey area.

Topography assessment has been included in integrated HCV-HCS Assessment. Refer to the HCV-HCS assessment time and method to see the detail.

2.4. GHG Calculation Assessment

2.4.1. Date and Assessment Process

The GHG assessment for planned land clearing and new land operations in KMS consists of data collection carried out in the field (along with High Conservation Value, HCV and High Carbon Stock, HCS assessment activities as part of the NPP requirements), analysis and report preparation that was carried out in Jakarta. The entire series of activities in the study were carried out in 2019-2021.

Table 16. GHG Date and Assessment Process

Step	Activity	Location	Time
Data Collection	• Review of secondary and reference data* • Field survey with GIS team* • Land cover classification* • Land cover carbon stock assessment*	KMS	April – October 2019
	• Collecting data on estimation of material use in plantation and mill operations.	KMS	October – November 2021
Analysis and preparation of reports	• Creation of land cover change scenarios using GIS. • Analysis of carbon stock and projected GHG emissions from each scenario of land cover change.	Jakarta	November – December 2021

*

2.4.2. Assessment Team and Their Qualification

The assessor team composition consists of a team leader expert on GHG analysis and GHG calculation, and team member expert on sustainability and remote sensing. Detail of the assessment team are presented on Table 17 below:

Table 17. GHG Team Assessor

Name	Role	Relevant Expertise
Foo Siew Theng	GHG analyst and Team Leader	GHG calculation according to RSPO Palm GHG and RSPO GHG Calculator for NPP activities
Jules Sonny Parapat	Data analyst and reporting	Sustainability expert
Sarimanah	Data Collector	Sustainability expert
Sandra Yossi	Data analyst and reporting	Sustainability expert
Rusli Awaludin	Spatial analyst	Remote sensing expert

2.4.3. GHG Analysis Method

Logical Framework

Carbon emission is the process of releasing carbon compounds into the atmosphere as a result of certain processes. In the process of developing oil palm plantations, land clearing is one of the main emission factors, because in this process the removal of cleared vegetation biomass occurs. Other sources of carbon emissions are found in the operational components of oil palm plantations, including the use of fuel, fertilizers, and vehicles.

Estimation of Greenhouse Gas Emissions

Estimation of greenhouse gas emissions was carried out using the September 2021 version of the RSPO New Development Green House Gas Calculator. This instrument results in a calculation of the projected annual net GHG emissions produced by new plantations. The variables calculated in this calculator consist of:

a. Land Use Change Emissions estimation
b. Fresh fruit bunch production plan
c. Field fuel plan
d. Peat emissions estimation
e. Fertilizer and N2O plan
f. Conservation area carbon sequestration
g. Production crop carbon sequestration
h. Mill data

The calculation process began by entering data in the available columns. The calculation then took place automatically and produces a summary table of results containing the emission values from each emission source along with the overall net emission value. The calculation results are expressed in tons of CO2e, tons of CO2e/ha, and tons of CO2e/tons of FFB.

Data Collection

This study uses existing data and information to produce projected GHG emissions from new plantations to be developed. In the process, calculations were carried out using two types of data, namely empirical data and assumption data. Empirical data are data and information extracted from records of the company's operational activities in the management of existing plantations and field surveys, while assumption data are data and information obtained from references. Assumptions are used to obtain data and information that are not available from records of the company's operational activities. The types of data used and their collection techniques based on each calculation variable used in the study are presented in Table 18.

Table 18. Data, Data Types and Data Collection Techniques Based on Each Calculation Variable in the Study

Variable	Data	Type	Data Collection Techniques	Source
Emissions from land clearing	• Area of land clearing plan • Initial distribution of land types • Benchmark emission factor values for each land type	Empiric Empiric Assumption	• Field survey and mapping • Field survey	HCV/HCS Report of Plasma KMS (2019) *New Development GHG Calculator* HCSA *Toolkit* Versi 2 (2017)
Fruit production	Average annual FFB production for one cropping cycle (25 years)	Assumption	Analysis and conversion of secondary data	Production data from Company
Use of fuel in plantations	• Type of fuel, activities that use fuel, and the amount of fuel used in each activity • Value of fuel emission factor	Assumption Assumption	Analysis and conversion of secondary data	Fuel usage data from Company *New Development GHG Calculator* version4 September 2021
Emissions from peatlands	No peatlands	Empiric	Field survey and laboratory analysis	- Land survey report (2016)
Fertilizer Usage Plan	• Type of fertilizer and amount of fertilizer used • Value of fuel emission factor	Assumption Assumption	Analysis and conversion of secondary data	Fertilizer usage data from the Company *New Development GHG Calculator*

				version4 September 2021
Carbon sequestration in conservation areas	• Land area for conservation • Value of carbon sequestration in conservation areas	Empiric Assumption	Field Survey	HCV/HCS Report of Plasma KMS (2019) HCSA *Toolkit* Version 2 (2017)
Carbon sequestration by oil palm plantations	The value of carbon sequestration in oil palm planting areas	Assumption	Field Survey	*New Development GHG Calculator* version September 2021

2.5. Land Use Change Analysis (LUCA)

2.5.1. LUCA Assessors and Their credential

The assessor team composition consists of a team leader and member whom expert on biodiversity, GIS, remote sensing, environmental and carbon analysis. This assessment has been conducted by Sustainability-Wilmar team in collaboration with GIS-Wilmar team in February - October 2019. Detail of the assessment team are presented on Table 19 below:

Table 19. LUCA Assessor Team

Name	Roles	Institution	Relevance Expertise
Syahrial Anhar Harahap **ALS license ALS17003SH**[19] **HCSA Registered Practitioners**[20]	Team Lead Biodiversity Expert	Sustainability – Wilmar	Conservation Ecology
Tri Haryo Sagoro **HCSA Registered Practitioners**[16]	Expert in Geographic Information Systems (GIS) and remote sensing	GIS Dept – Wilmar	Spatial, Mapping and Remote Sensing
Surya Purnama	Environmental and Carbon Expert	Sustainability – Wilmar	Ornithology, Biodiversity, Carbon Specialist
Purwandari	Team Member – GIS	GIS Dept – Wilmar	Spatial, Mapping and Remote Sensing
Lukman Sulaksono	Team Member – GIS	GIS Dept – Wilmar	Spatial and mapping
Rusli Awaluddin	Team Member – GIS	GIS Dept – Wilmar	Spatial, Mapping and Remote Sensing
Hairul Fatah[16]	Team Member – Environment	Sustainability – Wilmar	Herpetofauna
Moch. Dasrial[16]	Team Member – Environment	Sustainability – Wilmar	Forest Ecology

[19] https://hcvnetwork.org/assessors/syahrial-harahap/
[20] http://highcarbonstock.org/hcs-approach-quality-review-process/hcs-approach-registered-organisations/

2.5.2. LUCA Method

a. Data Usage

This study was using current technology of Geographic Information Systems (GIS) and remote sensing. This approach was carried out in all study process, including data collection, processing, analysis, and finalization of the land cover (Howard, 1996). One of the remote sensing supporting data that was usually used for land use and land cover analysis is Landsat and Sentinel from *United States Geological Survey*[21] (USGS).

Table 20. LUCA Land Cover Study

No	Land Cover Period	Used Satellite Imagery	Date
1	2005	1. Landsat 5 TM 2. Landsat 7 ETM+	1. 15 September 2005 and 1 October 2005 2. 26 November 2005 and 28 December 2005
2	2007	1. Landsat 5 TM 2. Landsat 7 ETM+	1. 4 August 2007 and 21 September 2007 2. 15 October 2007 and 2 December 2007
3	2008	Landsat 5 TM	19 January 2008, 15 March 2008, and 16 April 2008
4	2009	Landsat 5 TM	28 October 2009
5	2010	Landsat 5 TM	16 January 2010
6	2014	1. Landsat 7 ETM+ 2. Landsat 8 OLI	1. 27 May 2014 and 12 June 2014 2. 16 March 2014 dan 23 August 2014
7	2015	Sentinel 2A	26 December 2015
8	2017	Sentinel 2A	08 February 2017 and 19 January 2017
9	2019	Sentinel 2A	4 January 2019
10	2020	Sentinel 2A	14 January 2020
11	2021	Sentinel 2A	03 May 2021 dan 27 June 2021

[21] https://earthexplorer.usgs.gov/

b. Analysis and Data Processing

Data processing and analysis in this study was carried out through several stages, which are:

1) Image Pre-Processing, including Data Collection, Geometric Correction, and Image Cropping,
2) Digital Image Processing (Image Processing); Digital image processing (image processing) refers to sharpening the image display to identify a feature in the image and extract/retrieve selected information/data from an image (Robinson et al., 1995 in Hermawan 2008).
3) Visual Interpretation of Satellite Imagery,
4) Field Data Collection (Ground check), and
5) Test the accuracy of the interpretation results with the Confusion matrix method.

The images were then corrected on the geometric, radiometric, and topographic. When it was corrected, images were then analysed through onscreen digitization using the ArcGIS software for an initial land cover classification. This digitization process was based on several visual interpretation keys, such as colour, form, size, height, texture, pattern, position, and association with other objects. Verification of satellite image interpretation result data into a particular classification results need to be analyzed to test the accuracy and precision of the results of classification. To verify the land cover data that has been generated, then we do the ground checking. Accuracy calculation were using Confussion Matrix. According to Danoedoro (2005) in Harda (2013) states that the overall accuracy threshold is 85%. This value is used as the minimum value for the acceptance of a land cover mapping based on sensory images. The land cover classification was determined according to the HCSA Toolkit Version 2 (2017) guidelines.

2.6. FPIC

2.6.1. Team Assessors and Their Credential

Table 21. FPIC Assessor Team

Name	Role	Institution	Relevant Expertise
Maman Sucherman	Team Lead	Wilmar International Plantation	Conflict Resolution, Public Relation
Sarimanah	Team Member	Sustainability - Wilmar	OSH, Sustainability & Certification
Moch Dasrial	Team Member	Sustainability - Wilmar	HCV

2.6.2. Methods

FPIC process on the development of plasma are concerning on community engagement and seeking approval for plasma development within the area of interest. The process began with explanation of the plasma development plan, and as the results, community and company has understood and cooperated in the process and activities involved in the whole process of plasma development.

In this tenure study, KMS uses a rights system as the basis for extracting data which includes: subject of rights, tenure system, types of rights and objects of rights. The purpose of this data searching is to find out holistically the history of ownership and types of rights to lands handed over by the community (both in the form of compensation and management transfer to the partnership/plasma system).

Table 22. Key Elements in Land Tenure Study

Study Aspect	**Key Elements (Main Concern)**		
Right System	**Right Subject**	**Right Object**	**Right Type**
Data variables in study instrument	Land owner identity (individual / group / family / community)	Land boundaries Land location Land Area Land tenure history (source of rights, process of transferring rights, duration of land tenure) Current land use. Object of land rights. Who Cleared the Land	Ownership/Use Rights/Rental Rights Third Party Claims (if any)

Field study methods were carried out to collect data including:

- Filling out the worksheet. This activity was carried out using a questionnaire/filling form in the tenurial worksheet and interviewing land owners and adjacent land owners one by one to test the validity of the data (triangulation).
- Preparation of the minutes of the event. After completing the tenurial worksheet, an official report on the tenure study is made for further approval by the relevant village government official.

In the socialization of tenure studies, conveyed to the community about the Definitions, Objectives, Elements, Stages of the Tenurial Study activities that will and have taken place previously in the villages tenure studies. This tenure study was carried out by conducting interviews with each land owner per hectare registered in the land acquisition plan and conducting validation with the owners of land bounded in that area.

Tenurial study interviews in this technique were conducted by visiting land owners and people with borders one by one. This method was carried out by the field team and from village representatives who incidentally had no difficulty in tracking the whereabouts of the land owner per hectare and the people who owned the adjacent land. In addition, this technique also allows more detailed information related to land to be obtained because it is carried out more personally.

Group interviews/FGDs technique was carried out in groups by taking advantage of the gathering moments of the villagers as land owners. Field officers have a role in controlling the direction of the discussion when the Q&A is carried out so that the discussion can be directed and general information about patterns of ownership, patterns of land use can be obtained.

2.6.3. Timeframe

All the FPIC process of the plasma development are resumed in the Table 23 below:

Table 23. FPIC Process Timeframe

Date	Type of Activities	Participant	Output	Document Verification
27 January 2010	PT. RHS socialization about Smallholder	1. PT RHS 2. Seruyan Regency 3. Seruyan Hilir District 4. Pematang Limau Village Officials	1. Smallholder location area plan 2. Understanding Smallholder Development 3. Understanding Smallholder Permit process and requirements	Official Report and Documentation

		5. Pematang Limau Community		
03 May 2012	PT STP or PT RHS socialization about Smallholder road map	1. PT. STP 2. Pematang Limau Village Community	1. Smallholder Memorandum of Understanding 2. Provide information about submission of land location and Permit process to Seruyan Government 3. Understanding conform to Seruyan Government 4. Database of Smallholder Community candidates 5. Understanding Smallholder Road map	1. Smallholder development Road Map Document 2. Official Report of Socialization 3. Minutes of Socialization 4. list of attendees 5. Confirmation letter 6. letter of invitation from village 7. Minutes of Smallholder Socialization on 27 January 2010 8. Documentation of Smallholder Socialization on 27 January 2010 9. list of attendees of Smallholder Socialization on 27 January 2010 10. Map of Smallholder location plan

Tuesday, 12 August 2014	PT RHS socialization about SOP	1. PT. RHS 2. Pematang Limau Village Community	3. Socialization about SOP Revision 4. Scholarship Submission 5. Application of Access Road 6. Confirmation about CSR program change to the village 7. Confirmation about drain closure	6. Official report 7. Minutes of Socialization 8. Documentation 9. List of attendees
Wednesday, 06 May 2015	Socialization about SOP and MoU of PT RHS and Pematang Limau Village	1. PT. RHS 2. Pematang Limau Village Community	1. HCV Socialization 2. CD/CSR Socialization 3. HRD Socialization 4. PR Socialization	1. Official report 2. SOP 3. Minutes of Socialization 4. Documentation 5. List of attendees
Monday, 12 October 2015	Meeting of Pematang Limau Village Official and Smallholder Community	1. Cooperative KSU Smallholder Community 2. Pematang Limau Village Official	Mutual agreement Smallholder Community	1. Official report 2. List of attendees
Friday, 30 October 2015	Meeting of Pematang Limau Village Official and Smallholder Community	1. Cooperative KSU Smallholder Community 2. Pematang Limau Village Official	1. Determination of Smallholder Community candidates 2. Agreement of Smallholder Community	1. Official report 2. List of attendees

Thursday, 30 June 2016	Socialization of Prevention and control forest and land fires	1. Muspika Seruyan Hilir District 2. Pematang Limau Village Official 3. Seruyan Regency Government 4. Pematang Limau Village Community 5. PT. RHS	1. Memorandum of Understanding about Prevention and control forest and land fires 2. Understanding law enforcement about Prevention and control forest and land fires 3. from government to community	1. Official report 2. List of attendees
Friday, 22 September 2017	Annual meeting and PT RHS socialization in Pematang Limau Village	1. PT. RHS 2. Pematang Limau Village Community	1. SOP Socialization 2. HCV Socialization 3. CD-CSR Socialization 4. MoU Enclave Socialization	1. Official report 2. Documentation 3. List of attendees
Monday, 1 April 2019	Annual meeting and PT RHS socialization in Pematang Limau Village	1. PT. RHS 2. Pematang Limau Village Community	1. SOP No 44 Socialization 2. SOP No 35 Socialization 3. SOP No 34 Socialization 4. SOP No 47 Socialization 5. HCV Socialization 6. CD-CSR Socialization 7. Prevention and control forest and land fires Socialization 8. HRD Socialization	1. Official report 2. Documentation 3. List of attendees

3. SUMMARY OF FINDINGS

3.1. SEIA Summary of Finding

3.1.1. Negative and Positive Environmental Impacts

Based on interviews with local community, the environmental issues in the study area is potentially the reduction of river water quality (more turbid). Decrease in river water quality, not only due to the plasma KMS, but an accumulation of the activities in the upper stream of river. It is associated with more intensive land use in upstream areas (mining and various plantations companies), but it is also influenced by the high rainfall intensity factor and household waste because the local community also using the river as public toilets. This causes the need for clean water that still rely on Pematang Limau become more limited. In addition, there are also potential negative impacts to watch out and need to get the attention of the company such as decreasing air quality, decreasing of fish abundance in river, increasing noise level, increase in dust due to removal of embankment material, land fire, and decrease in flora and fauna around the activity location.

The potential positive impacts that can be generated is that by determining the HCV area in Plasma KMS and its management and monitoring plan, environmental sustainability of the area with high conservation value and high carbon stock can be well maintained.

3.1.2. Socio-economic impacts on the country, local, regional communities and emergent communities

Based on the interviews in the Pematang Limau village, the existence and development of plasma KMS will provides the potential negative impacts. Potential negative impacts include: the behavior of an increasingly consumerist society, the increasing land conflicts between people due to the increasing value of land, changing patterns of community livelihoods, and social disparities between indigenous communities and the migrants.

Besides the negative impact, the local community just obtain direct benefits of employment at the time of the survey and measurement of land, along with other religious social charity. The plasma development will potentially have positive impacts associated with the increasing income for the community from the plasma, better road accessibility from their village to the plasma area, thus open the opportunity to work and doing business, and various other social activities of companies.

3.1.3. Issues raised by stakeholders and assessor comments

The details of issues raised by stakeholders are presented on the Table 22 below. The assessor comments are referred as management objectives since the SIA assessment was conduceted internally by the social expert team.

Table 24. Social Impact of Plasma KMS Development

No	Parameters Impact	Source of Impact	Impact Benchmark	Management Objectives /Opportunities
1	Work opportunity	• There is a plan for Cooperative business activities. • The existence of Cooperative business capital.	There are new jobs available in the Cooperative business unit	• People lack of job can be recruited by Cooperative business activities • Growing new businesses
2	Mechanism consultation and communication	• The difficulty of information received by the community	• Availability of information boards • Cooperative consultation and communication mechanisms are in place.	• Easy information accepted by the community As an attitude of transparency of the Cooperative
		• Coordination and communication between Cooperativemanagement and members. • Coordination and communication between the Cooperativemanagement and the avalis.	• Schedule of regular internal management meetings. • Schedule of regular meetings between the Cooperative management and the avalis.	• There is a forum for communication between the Cooperative management and the avalis. • Communication between the Cooperative management and Cooperative

				members is going well.
3	Opportunity attempted	There is a reserve fund Cooperative business from the proceeds from the allocation of plasma profit sharing.	Opportunities were opened new venture.	• The existence of a new business that can contribute to increasing household income. • Ensure Cooperative business runs smoothly
4	Regional income	Cooperative obligations to the state	Fulfillment of all Cooperative tax / levy obligations.	Ensure all tax / levy obligations are met
5	Household Income	• Plasma profit sharing. • Cooperative profit sharing (SHU) • Cooperative business activities.	Household income at the top of the minimum wage, and rising every year or higher than the standard of income per capita per year for Seruyan District.	Increased income Cooperative member.
6	Institutional	• Plasma partnership activities. • Development of new Cooperative businesses	There is an new institutions as a medium of interaction between the Cooperative and the parties avails.	Ensure flow information and good communication between the Cooperative and the avalis through new institutions and new institutions
7	Public Perception	• Plasma partnership activities. • Allocation of Cooperative community social funds	Positive perception increase and perception negatives are reduced	Improve perception positive society towards Cooperative and plasma partnership programs.

8	Social transformation and culture	• Plasma partnership activities. • Cooperative business activities	The emergence of new positive cultural patterns	Maintain changes in positive cultural patterns and or manages existing new cultures.
9	Public health	• Environmental sanitary conditions • New activities for Cooperative business development	• Diseases originating from the environment are decline • Minimum standards for environmental health	• Minimize diseases originating from the environment • Fulfillment of minimum environmental health standards

3.1.4. List of Legal Documents Owned

Table 25. List of Document Owned

No	License	Issued by	Document number	Date
1	Deed of incorporation	Ministry of Cooperative and SMEs of the Republic Indonesia	075/BH/XVIII.14/IDKUMKM/VIII/2009	27 Juli 2009
2	Agreement with Community	PT RHS and Koperasi KMS	-	7 November 2017
3	Principle Location permit, covering 224 ha of area	Regent of Seruyan	500/1787/EK/XI/2016	30 November 2016
4	Decree of Prospective Farmers and Land (Calon Petani dan Calon Lahan)	Regent of Seruyan	188.45/428/2015	27 October 2015

5	Location Permit	Agency of OSS Management and Organizing	9120008871928	27 July 2017
6	Approval of UKL and UPL	Environmental Agency of Seruyan	660/454.1/DLH.II/XI/2019	25 November 2019
7	Plantation Business Permit (IUP)	Agency of OSS Management and Organizing	201912-3112-3739-9029-533	12 October 2020
8	Environmental Permit	Regent of Seruyan	503-H.A/01.001/DPMPTSP/I/2020	24 January 2020
9	Timber Utilization Permit	Forestry Agency of Kalimantan Tengah Province	522/13/II.2/Dishut	18 January 2021

3.2. Integrated HCV-HCS Assessment Summary of Finding

3.2.1. Study Area Boundaries (AOI)

In accordance with the HCSA Toolkit version 2 (2017), boundary of the AOI that was used for this assessment is five (5) km from the concession boundary. The AOI landscape context is viewed from the biogeographic conditions, ecosystem types, presence and condition of protected areas, forest reserves, areas of important biodiversity, key animal habitats, and Intact Forest Landscape (IFL). According to geography, the study area is still within the Seruyan watershed, which is located in the equator, where the climate in this area is determined by the relative movement of the sun with varying convective activity in each region. Therefore, the rain characteristic in this area is convective rain which causing wet climate conditions.

From the analysis results of the Kalimantan Tengah Forest and Watershed Designation (SK MenLHK No. 529/Mehut-II/2014) and the 2015 - 2035 Kalimantan Tengah Province Land use Plan, it shows that several conservation areas are identified within the AOI, including River's buffer conservation, and Watersheds. In addition, based on the Peat Hydrological Area Map (Kawasan Hidrologi Gambut - KHG) from the Ministry of Environment and Forestry (KLHK) and soil survey from PT RHS, there is no peat ecosystem landscape within the KMS plasma concession.

3.2.2. Landscape Context

In a landscape context, this plasma concession is located far from the IFL area. The location of the KMS

Plasma plantation is included in the Seruyan River Area under the name of Seruyan DAS. While crossing this area are the Saka Baru river and Pukun river, both of which are tributaries of the Seruyan River. In general, the river pattern in Seruyan Regency is a Dendritic pattern where one of its main characteristics is that if there is even rain throughout the watershed, the peak of the flood will be so high and have great potential to inundate the area around the river. The Seruyan River with a length of about 350 km, is the main river that flows from the Schwaner Mountains in the north to the Java Sea in the south. From the Seruyan river, there are 6 major tributaries that are used as water sources and transportation facilities, namely the Sembuluh River, Kuala Besar River, Manjul River, Salau River, Pukun River and Kale River.

3.2.3. Image Analysis and Land Cover Classification

Land cover analysis was carried out using a 10 m Sentinel 2A imagery, recorded on January 04, 2019 which was downloaded from the United States Geological Survey (USGS) online portal. The selection of imagery has been in accordance with the criteria given in the HCS guide (2017), namely: the age of the imagery used is less than one year, cloud cover is less than 5% and with a minimum spatial resolution of 10 m. To simplify the HCS analysis, several additional satellite imageries were used to show historical land cover, which are: 10 m Sentinel 2A (26 December 2015, 08 February 2017, and 19 May 2017) and aerial photography in May 2017.

The satellite image is then corrected through geometric, radiometric and topographic processes. This process uses ArcGis software and the initial stratification digitization is done visually. This visual digitization is carried out based on several key aspects in image interpretation, namely color, shape, size, height, texture, pattern, position and relationship of the image with other objects. The land cover is classified into seven classes and will then be regrouped based on the HCS land cover class (Table 26) according to the HCS guideline ver.2 (2017).

Table 26. HCS Classification (Toolkit ver.2)

Land Cover	HCS Land Cover	Deskripsi
Forest	*High Density Forest* (HDF)	Natural forest with closed to open canopy, varying from high to low density forest. Inventory data shows the presence of trees with a diameter of >30 cm and is dominated by climax species.
	Medium Density Forest (MDF)	
	Low Density Forest (LDF)	
Regenerated Forest	*Young Regenarating Forest* (YRF)	Highly disturbed forest or forest area in the stage of regeneration to its original structure. Diameter distribution is dominated by trees with DBH 10-30 cm with a higher frequency of pioneer species than HK1. Within this land cover class there may be small areas in the form of agricultural or plasma areas.

Land Cover	HCS Land Cover	Deskripsi
Scrub	*Scrub* (S)	The land was a forest but had been cleared in a not too long time. Dominated by low shrubs with limited canopy cover. Covers land with tall grass and ferns and scattered pioneer tree species. Some patches of old forest may also be found in this land category.
Land Clearing	*Open Land* (OL)	Newly cleared open land consisting mostly of grasses or plants, while only a few woody plants.
Oil Palm plantation	*Agriculture Estates* (AGRI)	Agricultural plantations and categorized as Non-HCS
Other Land Cover	1. Plantation Forest 2. Mine 3. plasma plantation farmers and plasma utilization 4. Others (water bodies such as rivers and lakes, as well as development areas, settlements, roads, etc.)	Categorized as Non-HCS area

3.2.4. Social Result

A. Interview and Focus Group Discussion

According to the in-dept interview and FGD with the community, there are several informations has gathered during pre-assessment, scoping study, and full assessment. The livelihoods of most of the people in Pematang Limau Village are currently private employees. While the others are fishermen, farmers, traders and Civil Servant or honorary. Communities who become fishermen generally live on river borders. Based on the results of interviews and FGDs, the existence and development of oil palm plantations and palm oil mills has caused people's livelihoods to shift from farmers or fishermen to private employees. This can be seen from the high percentage of employment of private employees (69%), compared to farmers and fishermen.

The tendency of social changes that occurred in the study location from the presence of palm oil companies also occurred in geographical conditions and community behavior patterns. Changes in geographical conditions caused by land clearing by companies have resulted in the opening of most of the forest area or agricultural land around residential areas. In addition, several road

infrastructure developments and other village facilities greatly affect the social changes of the community due to the ease of access to economic resources for residents.

On FPIC aspect, all the plan and development process for this schemed-smallholder was acknowledged and agreed by community, including land acquisition from community to KMS management who will manage the concession, and profit sharing after development.

B. Observation and Participatory Mapping

Participatory mapping is carried out to identify important areas protected by the community because they contain cultural, historical, spiritual elements, or as a source of livelihood and identification of land use. First step prior observation and participatory mapping was develop a team consist of community representative. The team were then went to the field to identify whole indicative landuse within the village, including private land, village forest area, community garden, company concessions, and especially boundary of KMS concession. From field observation and participatory mapping, no obligation from community to develop the KMS schemed-smallholder, and all land ownership in the area was known and had been compensated from previous owner.

Most importantly from this method, that community have awareness and understanding on the village landuse for their future land and food security. According to the community population and available land for food security, ratio number of people and cultivated area is 1.26 ha per person. This number is higher than minimum food security land that was recommended on the HCSA Toolkit (0.5 ha per person).

C. HCV 4: Ecosystem services in critical situations

In the Common Guide for HCV Identification (HCVRN, 2017), it is explained that HCV 4 includes the presence of (1) Areas for extreme water flow management, maintenance of downstream river flow, maintenance of water quality characteristics; prevention and protection from fire; protection of vulnerable soils, aquifers and fisheries; clean water supply; protection against wind, and humidity control, rainfall, and other climatic elements; and pollination services; (2) Areas such as forests, wetlands and other ecosystems that provide a barrier zone that protects from destructive fires that could threaten communities, infrastructure or other HCVs; groundwater recharge zone; and grassland areas that provide a zone of delimitation from flood or desertification hazards and (3) Remote and / or poor rural areas where people depend directly on natural resources to provide most of their needs, including water; important or extensive wetland and upstream areas, fish breeding grounds, or sensitive coastal ecosystems (mangroves, coral reefs, etc.); important water

catchment for a city; steep or mountainous areas or high rainfall areas with a high erosion risk; naturally low soil fertility area, especially sandy, peat or fragile soils.

In the assessment process, the riparian ecosystem of the Saka Baru River border was identified as HCV 4 which provides important hydrological functions as: (a) a filter to control of erosion and sedimentation, (b) a filter to control various chemicals used that will potentially have used when plasma plantation is operated, such as fertilizers, pesticides, and (c) flood control. In addition, in the context of the wider landscape, there is the Pukun River which also has an important hydrological function.

In addition, with the condition of land cover around the KMS plasma being mostly dry land agriculture and shrubs, the existence of the Saka Baru River can be an area that has the potential to become a natural firebreak area, even though the river is not very wide. This is because the vegetation along the Saka Baru River border is shrubby, with the dominance of the grass species such as *Imperata cylindrical* and *Dicranopteris linearis*, and vegetation species *Melaleuca cajuputi*. There are no trees in this area that are more than twice the width of the river. Meanwhile, in the eastern part of the KMS plasma concession, there is the Pukun River which also functions as a firebreak, where most of the vegetation along the Pukun River are of the *Alstonia scholaris*, *Aglaia rubiginosa* species, and *Aporosa antennifera*.

Based on the results of the analysis and field verification, it can be concluded that the HCV 4 area can be found in the KMS plasma in Saka Baru River. Meanwhile, in the landscape, the potential for HCV 4 was also found in the form of the Pukun River.

HCV 4	Finding
Basic ecosystem services in critical situations, including protection of water catchments and control of erosion of vulnerable soils and slopes.	**Present**

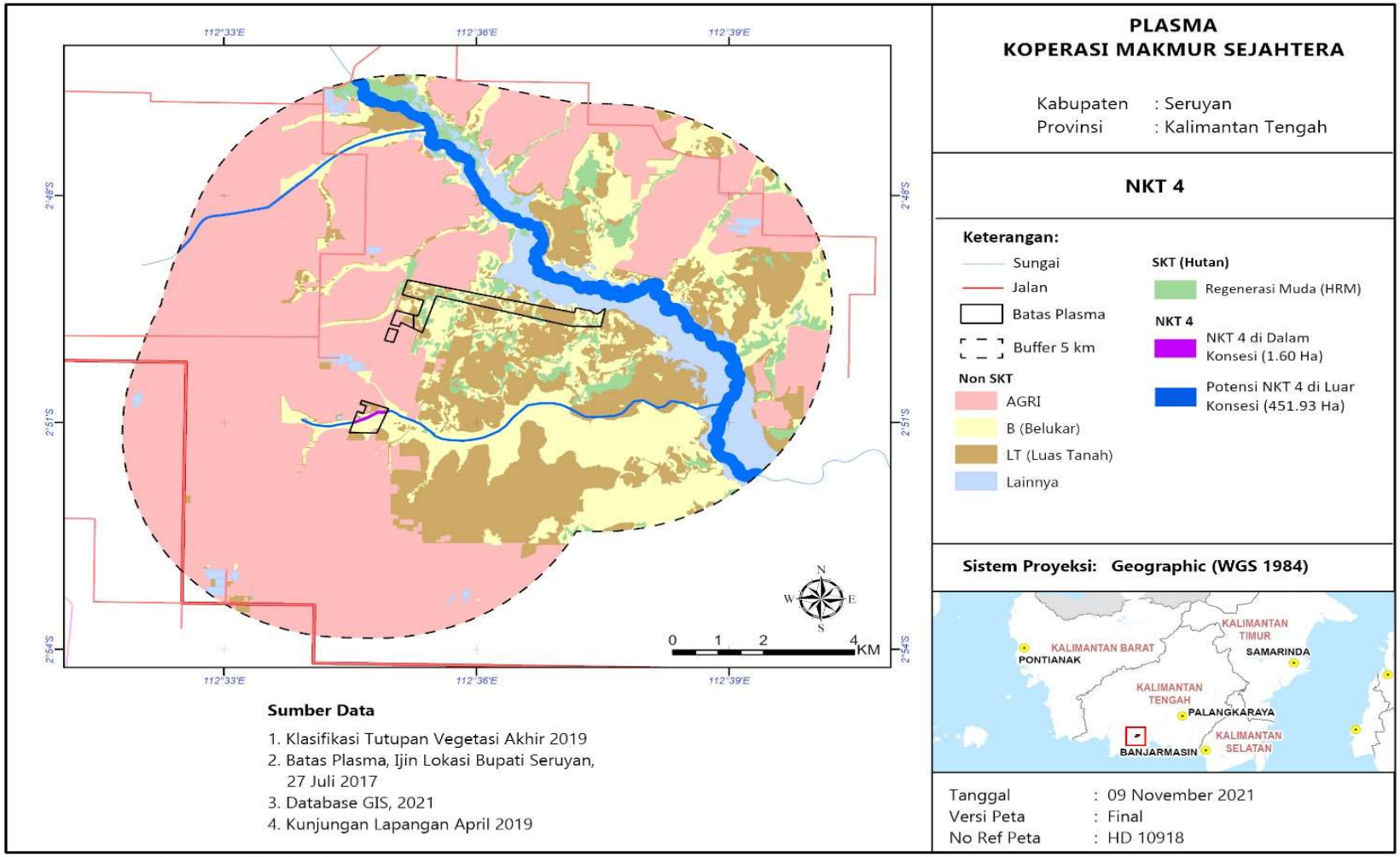


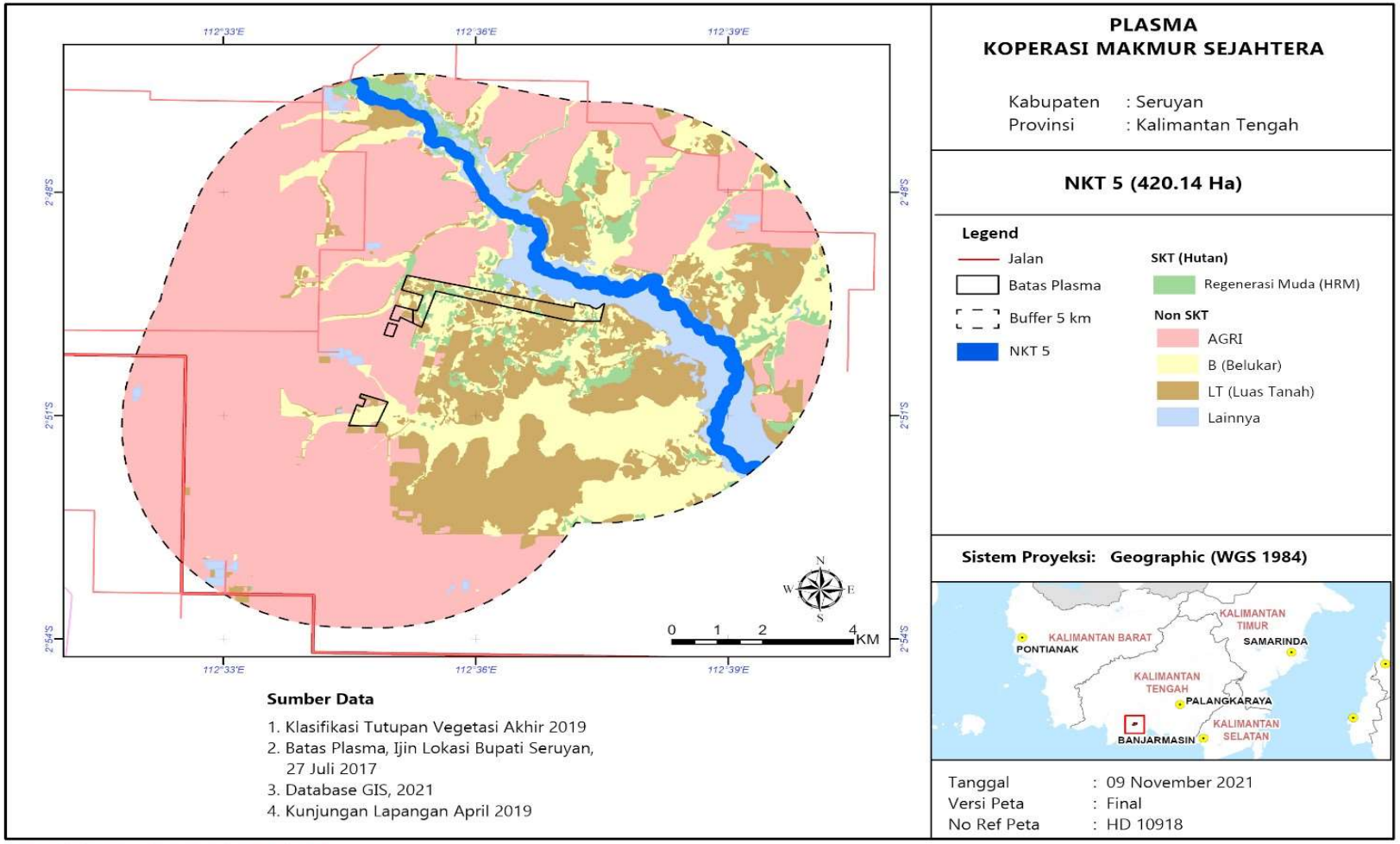
Figure 6. HCV 4 distribution

D. HCV 5: Local people's basic needs

In the Common Guide for HCV Identification (HCVRN, 2017), situations that indicate the possibility of HCV 5 are areas with: difficult access to health centers or hospitals; most of the houses and household equipment made from traditional / natural materials which are locally available; limited / no water and electricity infrastructure; community has a low capacity to support their daily needs; agriculture and livestock are undertaken on a small or subsistence scale; the presence of indigenous people who hunt and gather; the presence of permanent or nomadic herders; hunting and / or fishing is an important source of protein and income; and food obtained from the nature, either throughout the year or only during critical seasons.

Based on the results of field surveys, interviews and FGDs with the people of Pematang Limau Village, some people still use the river as a transportation route to the location of community gardens which are far from settlements. In addition, some people who work as fishermen use the river to find fish, as a source of their livelihood. The rivers that are the means of transportation and source of livelihood for the people of Pematang Limau Village are the Pukun River and the Seruyan River. The two rivers do not pass through the area within the KMS plasma, and only the Pukun River is within the study area. Therefore, based on the foregoing, it is concluded that within the KMS plasma area there is no area containing HCV 5. The potential for HCV 5 is in the Pukun River, which is outside the KMS plasma area.

HCV 5	Finding
Sites and resources fundamental for satisfying the basic necessities of local communities or indigenous peoples (for livelihoods, health, nutrition, water, etc.), identified through engagement with these communities or indigenous peoples.	**Potentially Present**



Hanya untuk kepentingan laporan penilaian NKT dan SKT

Figure 7. HCV 5 distribution

E. HCV 6: Cultural Values

In the Common Guide for HCV Identification (HCVRN, 2017), it is explained that HCV 6 is sites, resources, habitats and landscapes that have cultural, archaeological or historical significance at the global or national level and / or which have cultural, ecological, economic or cultural significance. Religious/sacred culture with critical to the traditional culture of the local community or indigenous peoples, which is identified through interaction/engagement with the local community or indigenous peoples concerned. There are several indicators used to analyze the presence of HCV 6 in an area, which are: zoning based on cultural rules; distribution of archaeological sites; distribution of ritual activities to local communities; and distribution of living natural resources to fulfill cultural needs. Based on data from the Ministry of Education and Culture16, there were no sites that were recognized by national policies and legislation as having high cultural values in the plasma KMS permit area. Meanwhile, based on interviews and FGD with the community and field verification, there was no indication of HCV 6 in plasma KMS.

HCV 6	Finding
Sites, resources, habitats and landscapes of global or national cultural, archaeological or historical significance, and/or of critical cultural, ecological, economic or religious/sacred importance for the traditional cultures of local communities or indigenous peoples, identified through engagement with these local communities or indigenous peoples.	Absent

F. Local people's lands and future livelihood security

The land tenure study was carried out by PT RHS management and KMS management during the land acquisition process. PT RHS and KMS have conducted a participatory survey to identify land use patterns and carry out land compensation in the plasma plan area. All prospective plasma lands have been compensated from the previous owner who is a community member of Pematang Limau Village. The land in the plasma will be designated as one of the sources of income and the community's economy, so that the basic needs of the community can still be guaranteed through the process of distributing the cooperative business income (*Sisa Hasil Usaha*) of the cooperative.

In addition, the community also still owns land outside the plasma area, which is located around the settlement. Each family owns between 2 – 15 hectares of land. A small part of the area is

planted with vegetables, corn, rice, and fruits. While most of the area owned is land that has not been processed by the community and is in the form of weeds.

Based on statistical data released by the Central Statistics Agency (2018), the population of Pematang Limau Village is 2,852 people. Meanwhile, the total area of cultivated and food crops available in Pematang Limau Village is 3,602.5 ha out of a total of 115,600 ha in all villages. The ratio of the number of people to the cultivated area is 1.26 ha per person. HCS Guide ver 2 (2017) stipulates that a minimum of 0.5 Ha of agricultural land per person in a family unit should be allocated for this purpose. Based on the results of the analysis, future land requirements for the Pematang Limau Village community are still greater than the minimum standard set out in the HCS Toolkit.

The existence of plantation areas or other non-food agricultural products is also able to generate cash and can be exchanged for basic needs/other food needs by buying. It can be seen that most people are no longer very dependent on forest products to meet their daily needs. There are no longer people who work as gatherers, people mostly rely on the results of cultivation and buying. Future land needs are also supported by the absence of plans to develop new plantations from the local government and the central government, because all company location permits around KMS plasma as well as community settlements have been frozen and revoked. This indicates that the community's land needs in the future are still quite available.

3.2.5. Environmental Result

A. Forest Inventory

From the results of the field inventory, it is known that the remaining forest in the KMS plasma area can only be found in the middle of the concession in small patch. This remaining forest is categorized as Young Regeneration Forest (YRF) stratum. Meanwhile, in the Shrub area, *Melaleuca cajuputi* is dominated species. The characteristics of each strata in the study area can be described as follows:

1. *Young Regenerating Forest (YRF)*

   Young Regeneration Forest is a regeneration stratum that has formed a forest ecosystem, with the dominance of the types of the families Hypericaceae (*Cratoxylum arborescens*), Myristicaceae (*Horsfieldia laticcostata*), and Myrtaceae (*Syzigium sp*). This area is spread over several small forest patches in the middle of the plasma.

2. *Scrub*

Scrub is a strata that was opened and burned due to the great fire in 1997. From the results of the field inventory, this strata has a vegetation structure that is dominated by *Melaleuca cajuputi*. A few stands of *Macaranga gigantea* and *Cratoxylum arborescens* trees also has been found.

3. *Open Land*

Vegetation in open land is generally dominated by grass *Imperata cylindrical*, ferns (*Dicranopteris linearis*) and some vegetation species *Melaleuca cajuputi.*

B. Biomass Analysis

The results of the analysis of the biomass in the KMS plasma shows that the carbon stock of the potential HCS class structure is below 35 tonsC/hectare (YRF about 25.31 tonsC/hectare). Meanwhile, in the non-HCS class, carbon stocks of 3.77 tonsC/hectare were found in the scrub strata and 1.12 tonsC/hectare in the Open Land strata. From the results of the analysis, it can be seen that the carbon stock in YRF is categorized as a low-carbon area, because it is still within the range of carbon stocks for the shrub class.

Table 27. Stock carbon estimation per vegetation class

Groups	Count	Sum	Mean	Variance	SS	Std Err	Low	Up
YRF	11	278.45	25.31	25.85	258.46	5.17	13.79	36.84
Scrub	9	33.91	3.77	7.28	58.25	0.59	2.41	5.13
Open Land	12	13.40	1.12	1.81	19.90	2.14	-3.60	5.83

Table 28. *Anova*

Source of Variation	SS	df	MS	F hit	P-value	F crit
Between Groups	3875.08	2.00	1937.54	166.92	0.00	3.33
Within Groups	336.62	29.00	11.61			
Total	4211.70	31.00	135.86			

Conclussion:

F Hit Anova > F Crit, which mean that all the strata have significantly different

Table 29. *Scheffe test*

Absolute Different (ABS)	
(a) HRM Vs Belukar	21.546
(b) HRM Vs Lahan Terbuka	24.283
(c) Belukar Vs Lahan Terbuka	2.737

Scheffe result

Comparation	**(X1-X2)^2**	**S2w((1/n1)+(1/n2))**	**F sceffe**	**Conclussion**
(a) YRF Vs Scrub	464.2216	2.352987947	197.29	significant
(b) YRF Vs Open Land	589.6611	2.029452104	290.55	significant
(c) Scrub Vs Open Land	7.491903	2.264750899	3.31	significant

F Crit Scheffe: 1.663827249

* F Scheffe > F Crit Scheffe which mean that all the strata have significantly different

Based on the results of field verification and carbon analysis, a re-stratification of land cover was carried out. This final stratification will be used as the basis for patch analysis and determining the HCS area through Patch Analysis and Decision Tree or PADT.

Details of each land cover class after re-stratification can be seen in the table below:

Table 30. Final land cover stratification area

Landcover Stratification	**Initial Stratification (Ha)**	**% from Total Area**	**Final Stratification (Ha)**	**% from Total Area**
Potential HCS Class:				
YRF	26.54	11.85	26.54	11,85
Sub-total	***26.54***	***11.85***	***26.54***	***11.85***
Non-HCS Class:				
Shrub	78.97	35.25	81.30	36.29
Open Land	98.43	43.93	96.10	42.89
Community Palm Oil	20.13	8.98	20.13	8.98
Sub-total	***197,53***	***88,15***	***197,53***	***88,15***
TOTAL	**224,07**	**100**	**224,07**	**100**

C. HCV 1: Concentrations of biodiversity

According to the HCV Common Guidance (HCVRN, 2017), HCV 1 area can be identified through the high overall species richness within an area, including endemic, and RTE species. Besides, the following criteria would also qualify for HCV 1:

a. Populations of multiple endemic or RTE species.

b. Important populations or a great abundance of individual endemic or RTE species, representing a substantial proportion of the regional, national or global population which are needed to maintain viable populations either: Year-round (e.g. key habitat for a specific species) or Seasonally, including migratory corridors, sites for breeding, roosting or hibernation, or refuges from disturbance.

c. Small populations of individual endemic or RTE species, in cases where the national, regional or global survival of that species is critically dependent on the area in question.

d. Sites with significant RTE species richness, or populations (including temporary concentrations) of priority species approaching those of key protected areas or other priority sites (e.g. KBAs) within the same biogeographic boundary.

Based on the Regional Spatial Plan (RTRW) of Central Kalimantan Province and the results of field surveys, it is shown that no conservation area that was found in the KMS plasma area and the study area. The nearest conservation area is Tanjung Puting National Park, which is 65 km away.

In the KMS plasma area, at least 46 plant species were found that were taken during the study process, both the scoping study, the main assessment, and the RBA. From those species, only *Tetramerista glabra* are included in the Vulnerable (VU) category according to the IUCN, and there are no species included in the CR/Critically Endangered (critical) category. In addition, there are no species protected by the State through the Minister of Environment and Forestry Regulation No. 106/2018. Based on survey results and field observations, the existence of this species is commonly found along the Pukun River border.

Based on the results of secondary data analysis, the plasma area of KMS is in the habitat of the Orangutan (*Pongo pygmaeus*). However, from the results of field observations at all stages of the assessment (initial assessment, main assessment, and RBA survey), no orangutans were found in the plasma KMS, either directly or traces (eg nests). During the interview process with local communities and company employees around the KMS plasma, it was also explained

that this species had not been found in the KMS plasma area since 1997. This is because the area in the KMS plasma is mostly shrubs due to the 1997 big fire, and no large forest that can support life for orangutans.

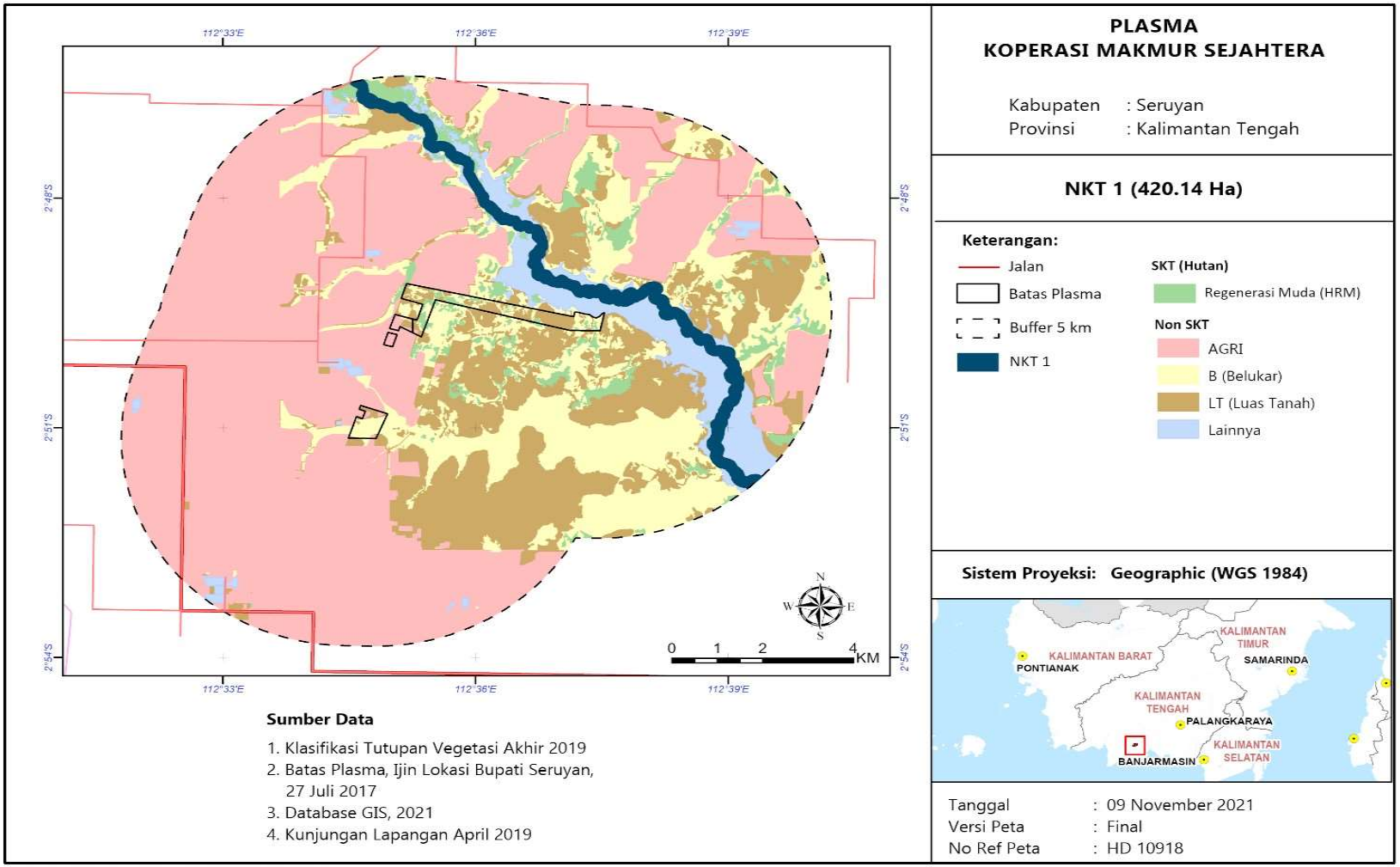
During the field survey in all stages of the assessment, 80 species of wildlife were found, with details: 8 species of mammals, 61 species of birds, and 11 species of reptiles. Of this number, there are 9 types of wildlife that are considered to be included in the RTE type, namely:

1. *Sus barbatus* (*Vulnerable*),
2. *Tupaia glis* (CITES appendix II),
3. *Tupaia minor* (CITES appendix II),
4. *Tupaia tana* (CITES appendix II),
5. *Naja sumatrana* (CITES appendix II),
6. *Pyton reticulatus* (CITES appendix II),
7. *Psittacula longicaudia* (*Vulnerable,* CITES appendix II, and protected),
8. *Calorhamphus fuliginosus (*Protected), and
9. *Loriculus galgulus* (protected)

Overall, there are no species that categorized into the IUCN CR (Critically Endangered) and EN (Endangered) categories. These types are very common in oil palm plantations, given the presence of this KMS plasma adjacent to the company's oil palm plantations, and also the Pukun River border where the vegetation condition is still maintained. In addition, the distribution of this species is not concentrated in one place, and tends to be spread out and leads to the east side adjacent to the Pukun River. This indicates that the potential presence of HCV 1 is possible in the forest along the Pukun River border, which still has tree stands and abundant water sources so that it is able to support the existence of these species.

During the survey in this study it can be concluded that the area within the KMS plasma is not a habitat for a species or a group of species. Potential HCVs are possible along the Pukun River border which still has forest stands.

HCV 1	Finding
Concentrations of biological diversity includingendemic species and rare, threatened or endangered species that are significant at global, regional or national levels	Potentially Present



Hanya untuk kepentingan laporan penilaian NKT dan SKT

Figure 10. HCV 1 distribution

D. HCV 2: Large Landscapes

According to the HCV Common Guidance (HCVRN, 2017), area that can be considered as HCV 2 are (a) Large areas (e.g. could be greater than 50,000 ha) that are relatively far from human settlement, roads or other access, (b) Smaller areas that provide key landscape functions such as connectivity and buffering (e.g. protected area buffer zone or a corridor linking protected areas or high-quality habitat together), and (c) Large areas that are more natural and intact than most other such areas and which provide habitats of top predators or species with large range requirements.

Based on the results of observations and studies using Intact Forest Landscape (IFL) in 2016 and the Land Cover Map of the Ministry of Environment and Forestry (2017), plasma KMS does not intersect with a large forest landscape.

Based on the description above, the KMS plasma area does not contain landscapes with special potential that can maintain the viability of populations of natural species representatives.

HCV 2	**Finding**
Large landscape-level ecosystems, ecosystem mosaics and Intact Forest Landscapes that are significant at global, regional or national levels.	Absent

E. HCV 3: Rare Ecosystems

Based on HCV common guidance (2017), HCV 3 includes ecosystems, habitats or refugia that have an important function due to rarity, level of threat, unique species composition, and other characteristics. To define a rare ecosystem, it is necessary to consider the presence of other similar ecosystems within the same biogeographic region and/or country. The composition, size, age, and structure of species in an ecosystem can be used as important criteria. For example, an ecosystem that is common in one region or country may be rare and fragmented (rare and threatened) in another.

Based on the laboratory results of soil samples by the Environmental Management Unit (EMU) Department team in January 2016 and RBA activities on 17 – 22 October 2019, the remaining plots of forest within the KMS plasma are in clay structures. Based on field condition data, the young regenerated forest plots were dominated by the Hypericaceae (*Cratoxylum arborescens*), Myristicaceae (*Horsfieldia laticcostata*) families, and Myrtaceae (*Syzigium sp*).

These types are vegetation types in mineral areas. This indicates that the forest plots in the KMS plasma are not included in the heath category.

From the overall analysis using these data, the KMS plasma area is not in a threatened or rare ecosystem, so it is concluded that there is no HCV 3 in the KMS plasma area.

HCV 3	Finding
Rare, threatened, or endangered ecosystems, habitats or refugia.	Absent

3.2.6. Peat Ecosystem

Based on the soil map and results of field leverage by the Environmental Management Unit (EMU) team in January 2013, there is no peat within Plasma KMS concession area. The results of soil analysis in Laboratory EMU (2013), the soil was included in mineral land according to the Regulation of the Minister of Agriculture No: 14/Permentan/PL.110/2/2009. In addition, based on the peat distribution map from the Ministry of Environment and Forestry (KemenLHK), the KMS plasma area is not located in a peat ecosystem.

Based on the land map and the results of field verification by the Environmental Management Unit (EMU) team in January 2016, the entire KMS plasma area is not located in a peat ecosystem. The components of the ecosystem type contained in the KMS plasma area are lowland forest with several types of land cover (Young Regeneration Forest, Scrub, Open Land and Community Oil Palm Plantation). The results of soil analysis in the EMU laboratory (2016) indicated that the organic C content was <20% and the organic thickness was not greater than or equal to 50 cm. So according to the Minister of Agriculture Regulation No: 14/Permentan/PL.110/2/2009 and also other references (JA Keague, 1981), the above results are included in mineral land or soil formed from weathering of parent rock with a thickness of organic matter less than 50 cm and organic C content is less than 20%.

Table 18. Soil analysis laboratorium report in the plasma KMS

No	No. Lab	Coordinate	HCS Strata	Soil Composition				Conclusion (J. A. Keague. 1981)
				C org %	Sand	Silt	Clay	
1	T.13.008	112° 35' 42.81698629" E	YRF	18,54	28,60	27,20	44,20	*Clay* (Liat)

		02° 49' 20.83211792" S						
2	T.13.009	112° 36' 42.03110775" E 02° 49' 36.17046094" S	YRF	9,11	37,75	15,56	46,69	*Clay* (Liat)
3	T.13.010	112° 34' 59.02987237" E 02° 49' 52.62728029" S	Agri	1,52	81,37	6,21	12,42	*Loamy Sand* (Tanah berpasir)
4	T.13.011	112° 34' 41.66796190" E 02° 50' 54.94229805" S	Shrub	1,14	72,43	6,36	21,21	*Sandy Clay Loam* (Lempung liat berpasir)
5	T.13.012	112° 35' 22.24562915" E 02° 49' 33.30347115" S	YRF	9,99	36,54	28,84	34,61	*Clay Loam* (Lempung berliat)
6	T.13.013	112° 37' 18.93265570" E 02° 49' 40.99161684" S	YRF	4,22	35,08	18,55	46,37	*Clay* (Liat)
7	T.13.014	112° 34' 40.27239713" E 02° 51' 05.48474293" S	Shrub	4,47	77,82	6,65	15,52	*Loamy Sand* (Tanah berpasir)
8	T.13.015	112° 34' 43.16877089" E 02° 50' 45.89854795" S	Open Land	4,45	86,78	2,20	11,02	*Sand* (Pasir)
9	T.13.016	112° 35' 13.84700549" E	Open Land	3,14	85,02	4,28	10,70	*Loamy Sand* (Tanah berpasir)

		02° 49' 41.25034965" S						
10	T.13.017	112° 36' 58.07965929" E 02° 49' 37.40840402" S	Open Land	14,18	64,04	11,99	23,97	*Sandy Clay Loam* (Lempung liat berpasir)
11	T.13.018	112° 35' 02.74410713" E 02° 49' 38.78301305" S	Agri	19,79	57,05	10,74	32,22	*Sandy Clay* (Liat berpasir)

3.2.7. Patch Analysis

From the field data analysis process, it is necessary to analyze the plots for each stratification class that has been carried out previously to conclude which areas need to be conserved or developed. This analysis uses a spatial approach, taking into account the area of each plot, the presence of a core zone with a buffer width of 100 meters, the distance between HCS plots as a connectivity consideration, the level of threat (roads, rivers, housing) and land cover analysis in the watershed of Seruyan river.

The results of the plot analysis are the area of each category of plots, as well as information on whether or not further studies are necessary in these plots, for example Pre-RBA or RBA. From the results of the analysis, there is an area that needs to be checked for its biodiversity (Rapid Biodiversity Assessment/RBA) covering an area of 26.54 ha. Since this study is an integrated study between HCV and HCS, the biodiversity data is taken from the HCV assessment data and the team is re-checked in the field. From the results of re-checking to several patches, no indications of high biodiversity values were found in these patches. Thus, the 26.54 ha area can be developed in accordance with the Patch Analysis Decision Tree (PADT).

Table 19. Patch analysis result

Category	Patch Classification		Size (Ha)	Size (%)
Recommendation to be conserved	1	High Priority Patch (HPP)	0	0
	2	Patch connected with HPP	0	0

	3	Patch connected with HPP outside concession	0	0
	4	Patch connected with other conservation area	0	0
	5	Medium Priority Patch (MPP) with low risk	0	0
Risk Mitigation	6	MPP with high risk and size > 10 ha	0	0
	7	MPP with high risk and size < 10 ha	0	0
Pre-RBA/RBA	8	Low Priority Patch (LPP) (<30% forest cover landscape)	26.54	11.85
Indicative development	9	LPP (>30% forest cover landscape)	26.54	11.85
HCV Area			**1.60**	**0.72**
Non HCS Area			**195.93**	**87.44**
Total area			**224.07**	**100**

Source: Team analysis, 2019

Based on the results of the plot analysis and participatory mapping, all of the plots within the concession are low priority forest patches that do not have a core, because the size of each plot is small. The next stage of analysis is land cover analysis around the study area. With a natural forest cover of less than 30%, the KMS Plasma plantation area is included in the 'low forest cover' category based on the definition of the HCS Approach Toolkit Ver.2. Thus, forest plots based on the decision tree and plot analysis are HCS categories with low priority.

Because these plots are of low priority, it is necessary to check the level of biodiversity (Rapid Biodiversity Assessment Process). Based on the results of data collection and analysis of biodiversity on the RBA patch, the following conclusions were drawn:

1. The diversity of wildlife species for mammals and herpetofauna in the patch is low (0.27 and 0.30) while birds are classified as moderate (2.62).
2. Diversity of plant species is low (1.55).
3. There are no types of flora and fauna that are included in the threatened category.
4. The patch visited in the RBA activity was lowland forest, and based on the analysis of primary and secondary data, no heath and peat forest types were found in the KMS plasma area.

Due to the low and moderate species diversity, and no species belonging to the RTE category were found, the RBA patch is a patch that can be developed.

In the process of analyzing the merging of HCV and HCS areas (step 11), it was discovered that there were HCV areas that were not present in the HCS area. The HCV area that is not included in the HCS area is the Saka Baru River border which has a function to cope with flooding and minimize the risk of water pollution. The next analysis is stage 12, which is checking the continuity of the landscape, corridor or intermediate forest between the proposed conservation area and other contiguous high priority forest patches within a 5 km radius. From the analysis process, no connection was found between the forest plots within the plasma area and the conservation zone near the concession. Due to the fact that all of the plots are low priority plots and have no HCV values, low levels of species diversity, and are not connected to other conservation zones, these plots can be categorized as areas that can be developed. As a final step, to ensure the results of the PADT process, a final verification (groundcheck) was carried out in the field. The results of this final verification show that the PADT process is appropriate with actual field conditions.

The distribution of areas that can be developed or that must be protected has been agreed and agreed in the ICLUP discussion process with the community and other stakeholders on January 15, 2020.

3.2.7. Overall Summary

Integration of HCV, HCS and land use maps from participatory mapping with the community was carried out to obtain conservation areas recognized by the community. This integration will also produce information on areas that can be developed within the KMS plasma which are located outside the HCV and HCS areas.

Table 31. Summary of HCV & HCS Identification

HCV Value	Area of Identified HCV (Ha)	HCV Management Area (Ha)
HCV Area	1.60	1.60
HCS Area	0	0
Plantable Area	222.47	99.28
Total HCV Area	**1.60**	**1.60**

Table 32. Summary of HCS Area

HCS Category	Ha
Give	0
Indicative Conserved	0
Indicative Developed	26.54
Linkage	0
Take	0
Total HCS	**0**

Table 33. Summary of Identified Value

Category	Ha	%
Conservation Area (HCV)	1.60	0.72
High Carbon Stock Area (HCS)	0	0
Plantable Area	222.46	99.28
Total Area	**224.07**	**100**

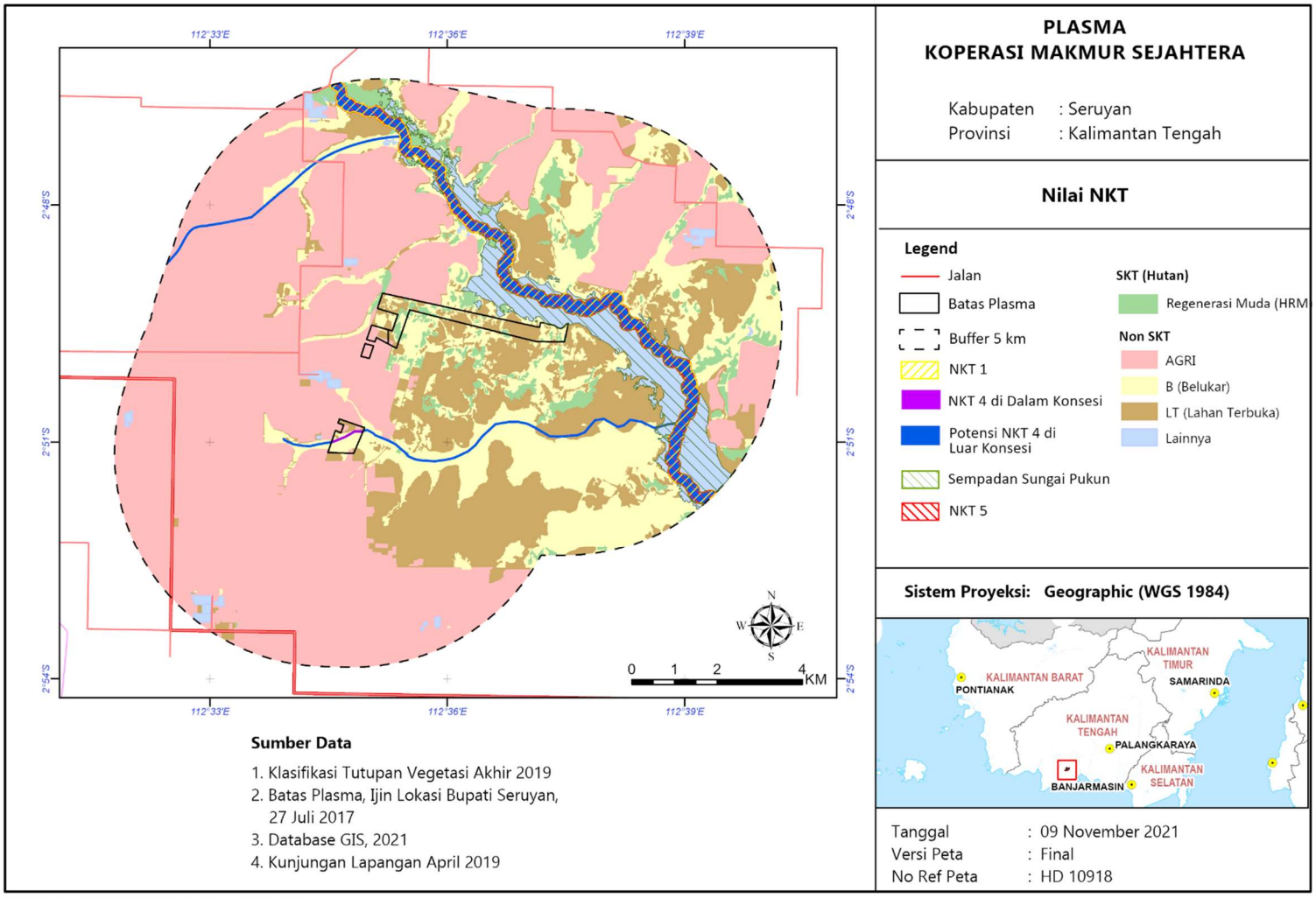
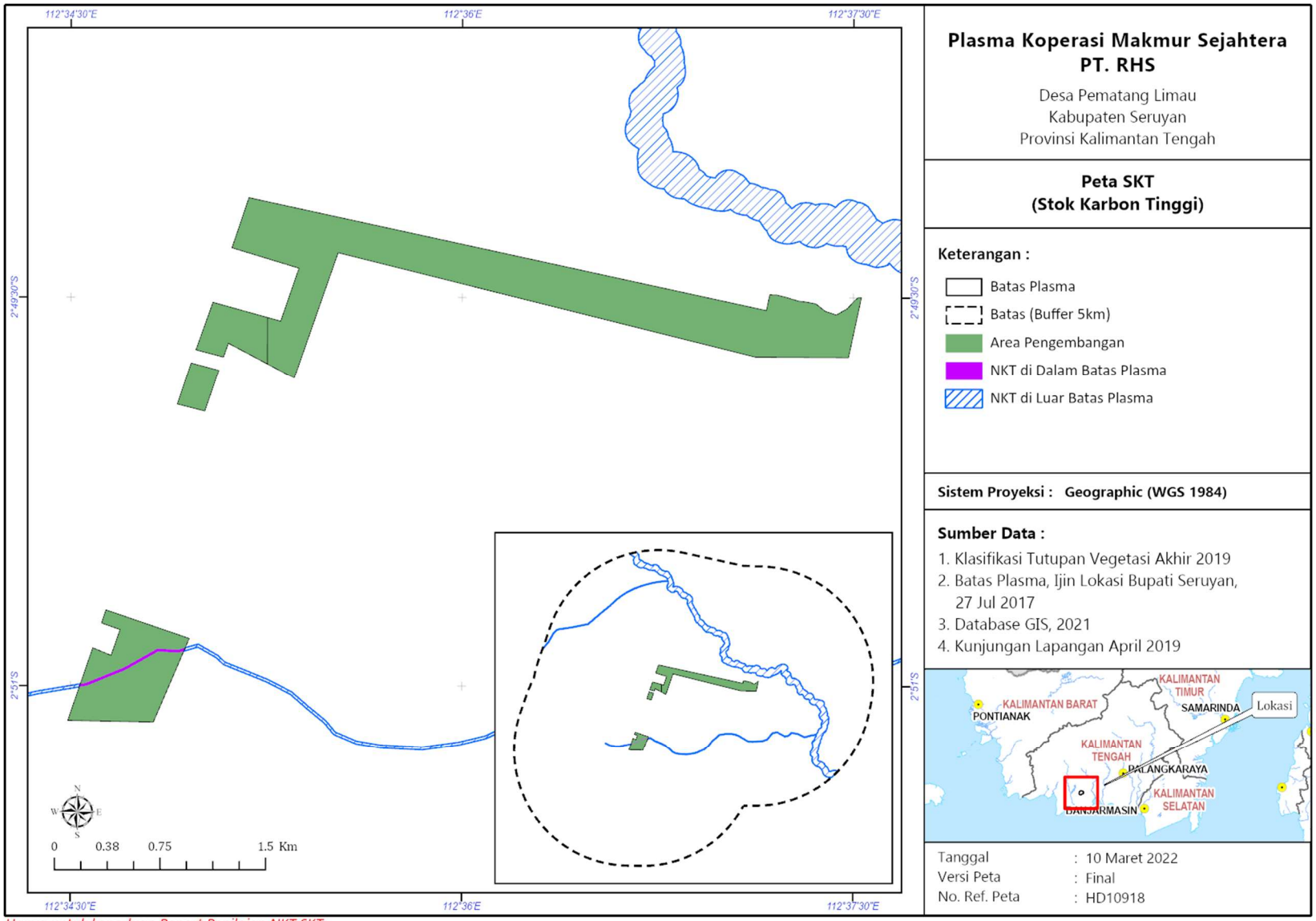
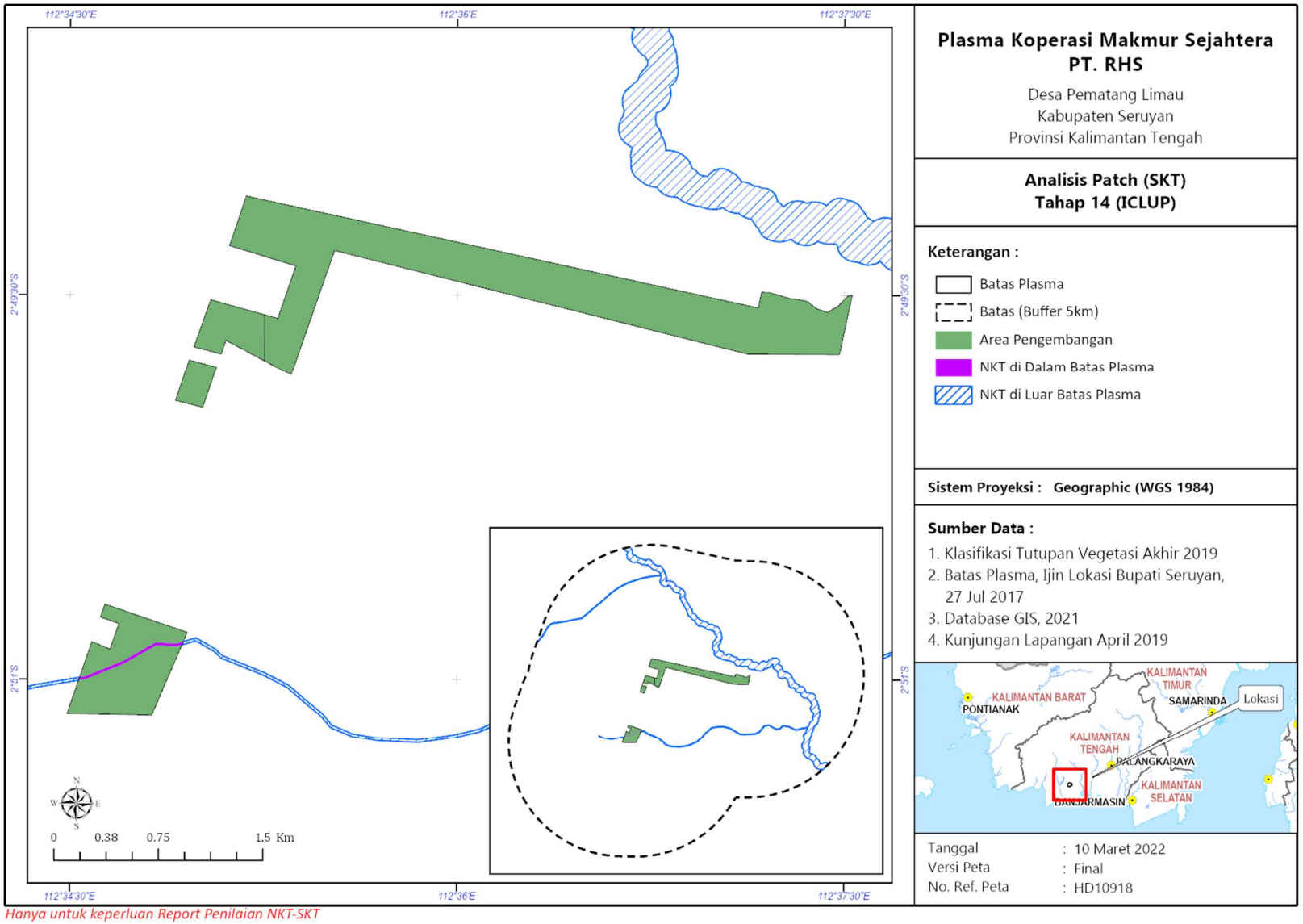


Figure 8. Final Map HCV



Hanya untuk keperluan Report Penilaian NKT-SKT

Figure 9 Final HCS Map



Hanya untuk keperluan Report Penilaian NKT-SKT

Figure 10. Final ICLUP Map

3.2.8. Final Consultation Summary

Public consultation is carried out through two methods, which are group and individual consultation. In group consultation activities planning, KMS management has sent invitations and an initial draft report document that containing initial result of the HCV and HCS identification and draft recommendations for management and monitoring of HCV and HCS areas. The invitation was share to the stakeholders around the plasma and Pematang Limau Village. The group public consultation was held on Wednesday, January 15, 2020 at the Pematang Limau Village Hall, Seruyan Hilir, Seruyan, Kalimantan Tengah which was attended by 25 participants, consisting of 1 District Government, 2 Pematang Limau Village representatives, 5 KMS Management, 2 people from environmental Non-Governmental Organizations, 11 Pematang Limau villagers, 2 representatives from PT RHS, and 2 assessment team members. Suggestions and inputs from stakeholders in this public consultation are used as material for reference in evaluating the results of HCV and HCS identification and the recommendations that have been prepared.

There were several institutions that were unable to attend this public consultation activity, due to other activities that coincided with the public consultation. The assessment team has opened a communication room, by including an email address and phone number on the invitation

Group Consultation

Table 34 Summary of Public Consultation

Group	Role of speaker	Organisation	Location and date
1. Cooperative members 2. Pematang Limau village administrative 3. Community Figure 4. Woman Figure 5. NGO 6. Seruyan Hilir government	1. Land owner 2. Village administration representative 3. Customary and leader 4. Woman representative 5. Independent stakeholder 6. Sub-district administrative 7. Avalist	1. KMS 2. Village government 3. Community 4. Woman group 5. Independent group	Pematang Limau village hall, 15 Januari 2020

7. PT RHS		6. Sub-district government 7. avalist	

Describe how the consultation was carried out (i.e., group meetings, telephone calls, individual interviews)

The consultation was conducted using the plenary method (open discussion) and was attended by all parties related to the existence of plasma KMS (25 people):

1. Members of the Cooperative (5 people)
2. Pematang Limau Village Government (2 people)
3. Pematang Limau Village Community Leaders (8 people)
4. Representatives of women (3 people)
5. NGO, FKPM (2 people)
6. Seruyan Hilir District Government (1 person)
7. PT RHS (2 people)
8. HCV and HCS Assessment Team (2 people)

The material presented is the result of an assessment that has been carried out by the PT RHS HCV team at Plasma KMS. All participants receive a copy of the summary of the assessment results and are given the opportunity to provide input and recommendations for the management and monitoring of HCV and HCS areas.

The presentation of the results of the assessment begins with the delivery of the aims and objectives of the public consultation and the stages of the assessment:

1. Prior to conducting the field study, a FPIC study was conducted with the community at the village office on 19 December 2016
2. The initial field assessment process was carried out in 2017, but due to problems with the new permit being obtained in 2018, re-verification and data analysis of potential HCV and HCS areas was carried out in 2019. Since this activity was carried out in 2019, the report must have carried out in the integrated HCV and HCS.
3. In the field, tree measurements (tree diameter and plots) have been carried out for the HCS study. Almost all of the trees at the points visited had a diameter of less than 20 cm (pole and sapling category). Only a few trees have a diameter of more than 30 cm.
4. From the results of field measurements and analysis of HCS data, the carbon stock in the plasma area is mostly categorized as open land (1.12 tons/ha) and shrubs (3.77 tons/ha). There are only 2 plots that are categorized as HCS areas, with carbon stocks of around 44.75 tonnes/ha

5. From the decision tree map analysis, the two plots are not included in the HCS category, because apart from not having a core, the biodiversity in that location is in the low category (there are no important species such as Orangutans, Bears etc.)
6. As for the HCV category, the area found is the Saka Baru River
7. There is a border of the Saka Baru River (NKT4) which has a function as a water catchment area, so that the area of 20 m on either side of the river cannot be planted. The area is also a swamp area.
8. All HCV values are conveyed to the community 1-6, but only HCV 4 is identified, namely the Saka Baru River border.

   The river border area is 1.6 hectares.
9. Recommendations for Management of HCV and HCS in KMS plasma include: a. HCV area designation
   b. Create a management and monitoring plan
   c. Installing conservation area information boards
   d. HCS management must be socialized to cooperative members internally.
   e. External socialization to the government or other external parties.
   f. A careful process is needed in the land clearing process
10. After the HCV and HCS processes are completed, it is necessary to carry out a New Planting Procedure (NPP) because the KMS plasma is an avalist from PT RHS, which incidentally is a member of the RSPO
11. The stage in the NPP is to make a report according to the NPP format and then submit it to the RSPO. The process will take between 2 – 3 months, depending on whether or not there are revisions or questions related to the KMS plasma plantation development plan.

Key anxieties & recommendations

Abdurrahman (Member of KMS):

This plasma has been planned for a very long time, since 2016. In the past the problem was licensing, and now it requires a New Planting Procedure (NPP). Can it be planted immediately after the NPP report is finished?

We as cooperative members are afraid that if we study too much, we will not be able to plant. It's a hassle if we haven't produced it yet, but we already have a big debt to PT RHS. Later the harvest will be deducted from debt, including costs for this activity. We want it to be planted immediately and can be harvested immediately so that our debt is paid off immediately. What's more, it will have to do with the RSPO. Surely the cost will be added again. While we don't have anything.

Supiansyah (KMS Plasma Cooperative Manager):

We, as the management of the cooperative, ask for the plasma to be planted immediately so that we don't see the debt data all the time. If you plant and produce, at least our bookkeeping data contains income, not expenses. Regarding the presence of HCV areas, in principle we agree with the areas submitted by the HCV team. In the future, is there the possibility of adding more HCV areas? We hope that the Saka Baru River Border area is sufficient, not others. Let it be in PT RHS which is the HCV area, not our plasma.

Aliansyah (Community Leader):

Looking at the order of permits, there are location designation permits, location permits, environmental permits, timber utilization permits and clearing permits. Learning from the previous slow licensing process, can other permits be faster? related to timber utilization permits, are fully processed by the relevant agencies. However, looking at the diameter of the wood below 20 cm, it is hoped that it will be faster. Furthermore, the NPP should also be assisted by PT RHS so that it can be done quickly. Don't let the community be harmed by the long and protracted licensing process.

Adriani (Chairman of KMS):

Currently the location permit has been obtained and is currently in the process of fulfilling environmental documents and environmental permits which currently the DLH recommendation has been issued and is waiting for an environmental permit from PTSP on an OSS basis. After the environmental permit is issued, it will be brought to the province for processing the Timber Utilization Permit and LC Permit.

Maslan (FKPM):

PT RHS must be serious in developing plasma plantations, not just talk without clear action. If you look at the input from the community, most of whom feel that this process is long, RHS should be able to help more quickly. Cooking has been from 2016 until now has not been completed. Don't use licensing issues as an excuse. You all can be demoed by the community if this process is slow. Even the district government can revoke the plasma permit again if this drags on. The presence of HCV areas should also not be an excuse to slow down the process. RHS should be able to immediately build a plasma. Moreover, this has been agreed with the community. If people are tired, what do you do? Yes sir ma'am? So, as an NGO in Seruyan, we demand that RHS is serious about realizing this plasma.

Jailani (Seruyan Hilir District Government):

First, we apologize that the Camat cannot attend and represent me. In principle, we as the District Government support this HCV and HCS assessment program, as well as the presence of plasma in Pematang Limau Village. These HCV and HCS areas are also important to ensure the existence of living and non-biological natural resources and to maintain the function of ecosystems around the plantations. Not all gardens damage the environment. With this assessment, it is very good to answer the anxiety of the outside world on the issue of palm oil that damages the environment. However, it should also be noted that the existence of plasma is also important for the community as one of the people's economic income. Do not let this economic function be abandoned. So, everything must be balanced and even. The environment is maintained and people's incomes also increase. If there is a licensing problem, we as the District Government are ready to help you so that this can be resolved quickly. However, it should be noted that the system is now embedded in the OSS. So it's not like it used to be, the original signature was then finished. Especially for this KMS yesterday, the Regent wanted to sign in 2017. When he wanted to sign, an instruction was issued regarding OSS, so he did not sign. That's why the location permit at KMS is dated 2017, but OSS issued it in 2018. The term is a loss of 1 year of the permit. But that's okay, the important thing is that now the permit has been obtained and the plantation can be processed immediately. We think that's the explanation and hopefully the existence of this plasma will further improve the economy of Pematang Limau Village

Bondan Andrianto (Secretary of Pematang Limau Village):

We also apologize, because Pak Kades was unable to attend. He had a meeting with the Camat at the District Office, so he represented me. The village head had left his greetings to all of you, and his hopes were the same as what Mr. Jailani had said earlier. With the existence of this plasma, the community will be helped economically, because it will get additional income from plasma. Previously, only from their own gardens which did not necessarily produce such as plasma. Apart from that, we also welcome this HCV and HCS assessment. We ourselves have participated in the socialization of the presence of HCV areas in PT RHS' plantations, and at least we have an idea of what HCV is. So the presence of HCV is very good because not all plantation areas have to be planted with oil palm. There are areas that need to be preserved so that our children and grandchildren can enjoy them. For this reason, the community and KMS members should be grateful that RHS actually supports this HCV and HCS assessment. As for plasma development, we have to be gradual according to regulations. Don't break the rules. Fast doesn't mean breaking the rules. Later, you can be subject to criminal sanctions if you violate existing permits. So that's an important point that can be conveyed by us.

Assessment team response

Surya Purnama:

Answering what was asked by Pak Supiansyah, the results presented to the public are now final, based on the results of a detailed analysis. If the whole community agrees with this result, then this is the area we will finalize and then send it to the HCVRN for review. As for Mr. Abdurrahman's question, if the NPP has been approved by the RSPO, then the land clearing process can be carried out. What you need to pay attention to is licensing as well. Land clearing after the NPP must also be accompanied by the legality of other permits, such as environmental permits and land clearing permits. For input from Mr. Maslan, RHS in principle also wants the plasma development process to be carried out as quickly as possible according to regulations and certification. Since the MoU with the community, RHS has always tried to help this process to be fast. Even for this HCV and HCS assessment, the costs of experts, field workers and logistics for the assessment are fully assisted by RHS without burdening the plasma. So this has become RHS' commitment to fulfill plasma.

Iskandar Zulqarnain:

What was conveyed by Mr. Adriansyah actually answered the concerns of Mr and Mrs. When the NPP report has been approved by the RSPO, the management must ensure that other permits must be fulfilled such as macro permits, Timber Utilization Permits and land clearing permits have been obtained. If the permit already exists, the planting process can begin. The company said it had also assisted in the processing of permits that must be owned by cooperatives. What is charged to plasma is the cost of licensing and sending reports to the HCVRN. Meanwhile, labor and logistics costs such as accommodation, transportation and team meals are all borne by RHS and not borne by plasma.

Individual Consultation

Table 35 Summary of individual consultation

Name	Tittle/Role	Organisation	Location
1. Suwardi 2. Isnawan Haryoko 3. Edianto	1. General Manager PT RHS 2. Group Estate Manager PT RHS 3. Asistant General Manager PT RHS	PT RHS	1. Eksekutif Mess Regional Office, 16 Januari 2020 2. Estate Office PT RHS, 17 Januari 2020 3. Eksekutif Mess Regional Office, 16 Januari 2020

Describe how the consultation was carried out (i.e., group meetings, telephone calls, individual interviews)

Consultations are carried out by direct face-to-face meetings and record all inputs and corrections from the parties. Meetings are held individually by visiting resource persons in their respective offices.

Key anxieties & recommendations

1. Suwardi

Judging from the results of the land suitability survey conducted by the agronomy team, the area as a whole is a potential area for planting because it has quite fertile non-peat mineral soil. If you follow the wishes of the community, all areas should be opened. It's just that it is necessary to maintain the border of the Saka Baru River so that there is no potential for water pollution from the application of fertilizers or sprays. It is important for cooperative members to understand that protecting the environment is also one thing that the community should not forget in developing plasma plantations.

2. Isnawan Haryoko

This plasma has long been wanted by the community. Land has also been acquired, and PT RHS is ready to help with initial funding. It's just that it is necessary to be careful in land clearing so that there is no severe environmental damage. In principle, we strongly support the results of this survey and analysis so that the community can understand why this HCV and HCS survey is important.

3. Edianto

This land has been prepared for a long time, since 2016. It should have been opened long ago. The process of compensation by cooperatives to land owners has also been carried out for a long time. If this process takes longer, it will affect the cashflow that has been issued by PT RHS to assist plasma development. Not to mention people who feel that companies are slow in opening plasma, even though there are quite a lot of stages.

Assessment team response

1. Surya Purnama

a. Responding to Mr. Suwardi's input, based on the results of the analysis, the Saka Baru River border area really needs to be protected, because it is a river border and is important to prevent flooding and potential pollution.

b. Responding to Pak Isnawan Haryoko's input, in principle the assessment team would like to thank PT RHS for the support and commitment to developing this plasma plantation. Although the process is a bit long, all this is done so that the development of the plasma can be in accordance with the existing conservation principles and regulations.

2. Iskandar Zulqarnain

Responding to Mr. Edianto's input, the development of plasma plantations is indeed a long process. In 2016, socialization was carried out together with the government to the public. Then proceed with the process of land identification and permit application. At the time of applying for a permit in 2017, a new regulation was issued regarding the issuance of permits through 1 door, namely OSS (One Single Submission), so that this plasma permit was only issued by OSS in 2018, although in writing it was issued in 2017. Finally, a new study can be carried out after the permit is out, so the impression takes a long time. In general, cooperative members understand the process.

3.2.9. Next Step

Analysis and identification of HCV and HCS within plasma KMS is one of the sustainability policy requirement prior development the area for concession. To follow up this process, there were several important steps need to be conducted by cooperative management and PT RHS:

a. The identified conservation areas in this study are mainly obtained from the delineation and analysis of the map; therefore, the boundaries in the field should be walked and clearly demarcated.
b. Designation of identified HCV and HCS area as conservation areas
c. Develop management and monitoring plans with refer to the management and monitoring which has been developed with community
d. Establish signboards that contain information of HCV and HCS areas
e. Conduct regular patrol to monitor of the HCV and HCS areas, as well as biodiversity and threats that potentially exist within the conservation areas
f. The management and monitoring plan of HCV and HCS area must be socialized internally, synchronously and integrated with various programs in the cooperative and also PT RHS. All staff from

multiple layer and position must be aware and understand about HCV and HCS management policies, so that there is no gap in understanding of the implementation of HCV and HCS.

g. There needs to be a conservation organizational structure with adequate and competent human resources to implement of the management and monitoring of HCV and HCS. The conservation staff must be supported by the equipment that will be used in the management and monitoring of HCV and HCS areas. This plan should be discussed between PT RHS and also management of KMS.

h. Outreach community, government agencies, and other interested institutions on the management and monitoring of HCV and HCS area, because management of HCV and HCS is multidimensional and not only on site, but is also influenced by other activities outside the plasma KMS area.

i. Management of PT RHS and also cooperative of KMS needs to coordinate with related agencies (BAPPEDA, Forestry Agency, BKSDA, and other relevant agencies) in the context of implementing management and monitoring of HCV and HCS, including in relation to protecting of protected flora and fauna.

3.3. Soil Survey and Topography

3.3.1. Soil Type

A total of 11 survey sites have been tested for thickness of organic matter and soil samples collected at each location. Of the 11 soil samples tested in the EMU-CKP laboratory, the results showed that all samples had organic C content <20%. From the results of checking the thickness of the soil organic matter, nothing showed that it was at a value of 50 cm. The collection of soil structure profile information obtained also did not show any indication of fragile soil. At survey point No. 4, a soil profile image is obtained where the thickness of the organic soil (top layer) is very thin and immediately followed by a layer of sandy clay. There is no soil structure profile information that shows fragile and peat soil.

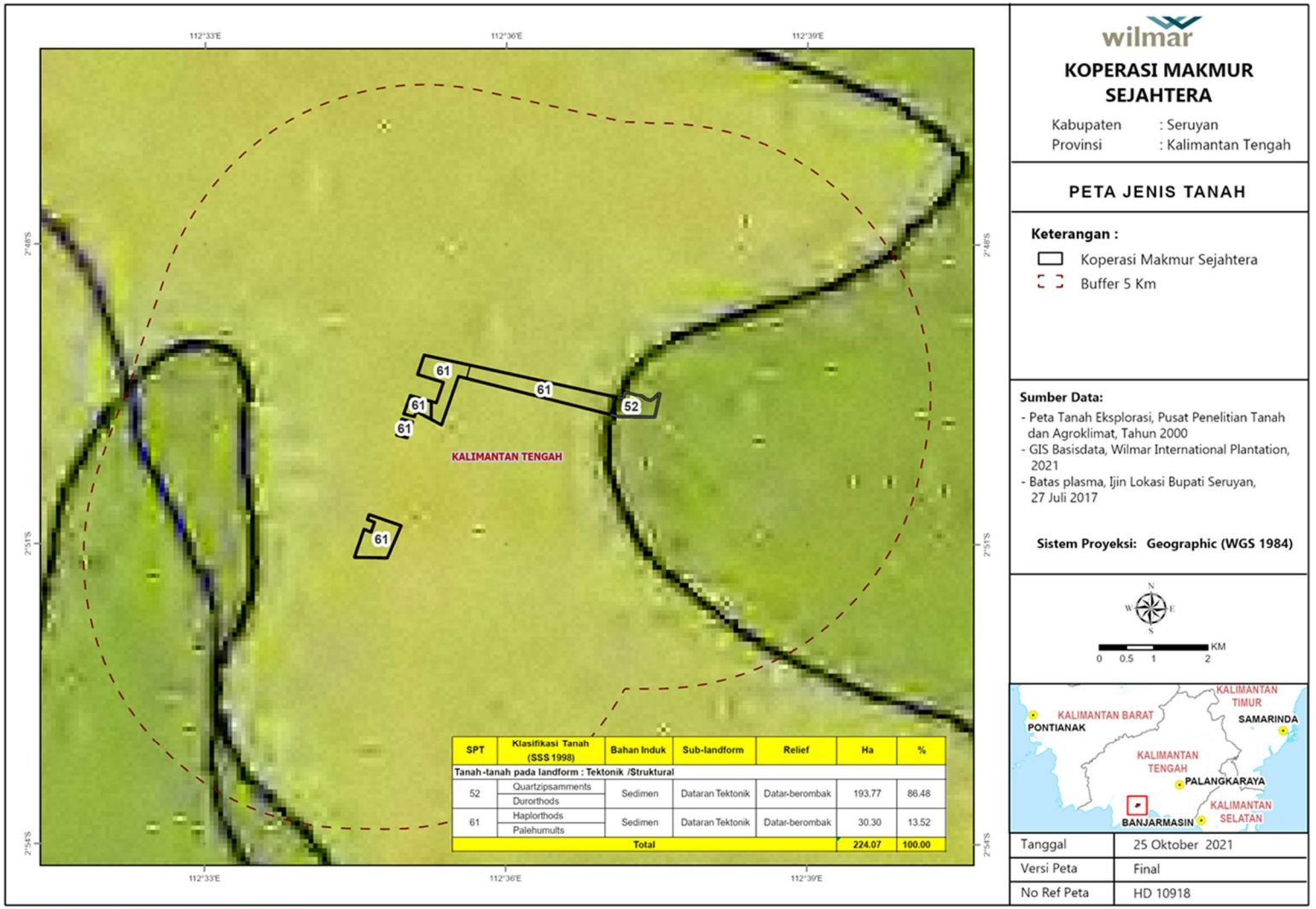
The laboratory results of the soil sampling survey are as follows:

Table 36. Laboratory Results of the Soil Sampling Survey

No.	Lab No.	ID Sample	Koordinat		C Organik	Texture (%)			Keterangan
		No. SSU/AFD/Block	X	Y	(%)	Sand	Silt	Clay	
1	T.13.008	Point 1 (0-50)	112° 36' 14.868" E	2° 49' 30.223" S	18.54	28.6	27.2	44.2	Clay (Liat)
2	T.13.009	Poin 2 (50-100)	112° 36' 36.755" E	2° 49' 35.939" S	9.11	37.75	15.56	46.69	Clay (Liat)
3	T.13.010	Poin 2 (0-50)	112° 34' 54.995" E	2° 49' 54.665" S	1.52	81.37	6.21	12.42	Loamy Sand (Tanah berpasir)
4	T.13.011	Poin 2 (50-100)	112° 34' 39.264" E	2° 50' 53.340" S	1.14	72.43	6.36	21.21	Sandy Clay Loam (Lempung liat berpasir)
5	T.13.012	Poin 3 (0-50)	112° 35' 26.622" E	2° 49' 33.111" S	9.99	36.54	28.84	34.61	Clay Loam (Lempung berliat)
6	T.13.013	Poin 3 (50-100)	112° 37' 17.086" E	2° 49' 43.683" S	4.22	35.08	18.55	46.37	Clay (Liat)
7	T.13.014	Poin 4	112° 34' 53.258" E	2° 50' 58.724" S	4.47	77.82	6.65	15.52	Loamy Sand (Tanah berpasir)
8	T.13.015	Poin 6 (0-50)	112° 34' 42.404" E	2° 50' 47.099" S	4.45	86.78	2.2	11.02	Sand (Pasir)
9	T.13.016	Poin 6 (50-100)	112° 35' 14.245" E	2° 49' 42.437" S	3.14	85.02	4.28	10.7	Loamy Sand (Tanah berpasir)
10	T.13.017	Poin 7 (0-50)	112° 36' 57.874" E	2° 49' 30.297" S	14.18	64.04	11.99	23.97	Sandy Clay Loam (Lempung liat berpasir)
11	T.13.018	Poin 7 (50-100)	112° 34' 57.821" E	2° 49' 45.738" S	19.79	57.05	10.74	32.22	Sandy Clay (Liat berpasir)

3.3.2. Topography and Elevation

Based on data from the Center for Soil and Agroclimate Research (2000), the soil types in this area are included in the Entisols and Spodosol categories (Figure 5). From the distribution of soil types and the Indicative Map of Postponement of New Permits / Peta Indikatif Penundaan Pemberian Izin Baru (PIPPIB), it can also be seen that the KMS plasma area is not in the peat soil zone (Figure 6). Meanwhile, in terms of topography, almost the location of Plasma KMS is included in the flat slope with a slope class of 0 - 8 degrees (Figure 7) and the entire area is in the lowland elevation zone (0-500m), which is shown in Figure 8.



SPT	Klasifikasi Tanah (SSS 1998)	Bahan Induk	Sub-landform	Relief	Ha	%
Tanah -tanah pada landform : Tektonik /Struktural						
52	Quartzipsamments Durorthods	Sedimen	Dataran Tektonik	Datar-berombak	193.77	86.48
61	Haplorthods Palehumults	Sedimen	Dataran Tektonik	Datar-berombak	30.30	13.52
Total					224.07	100.00

Figure 11. Map of Soil Types

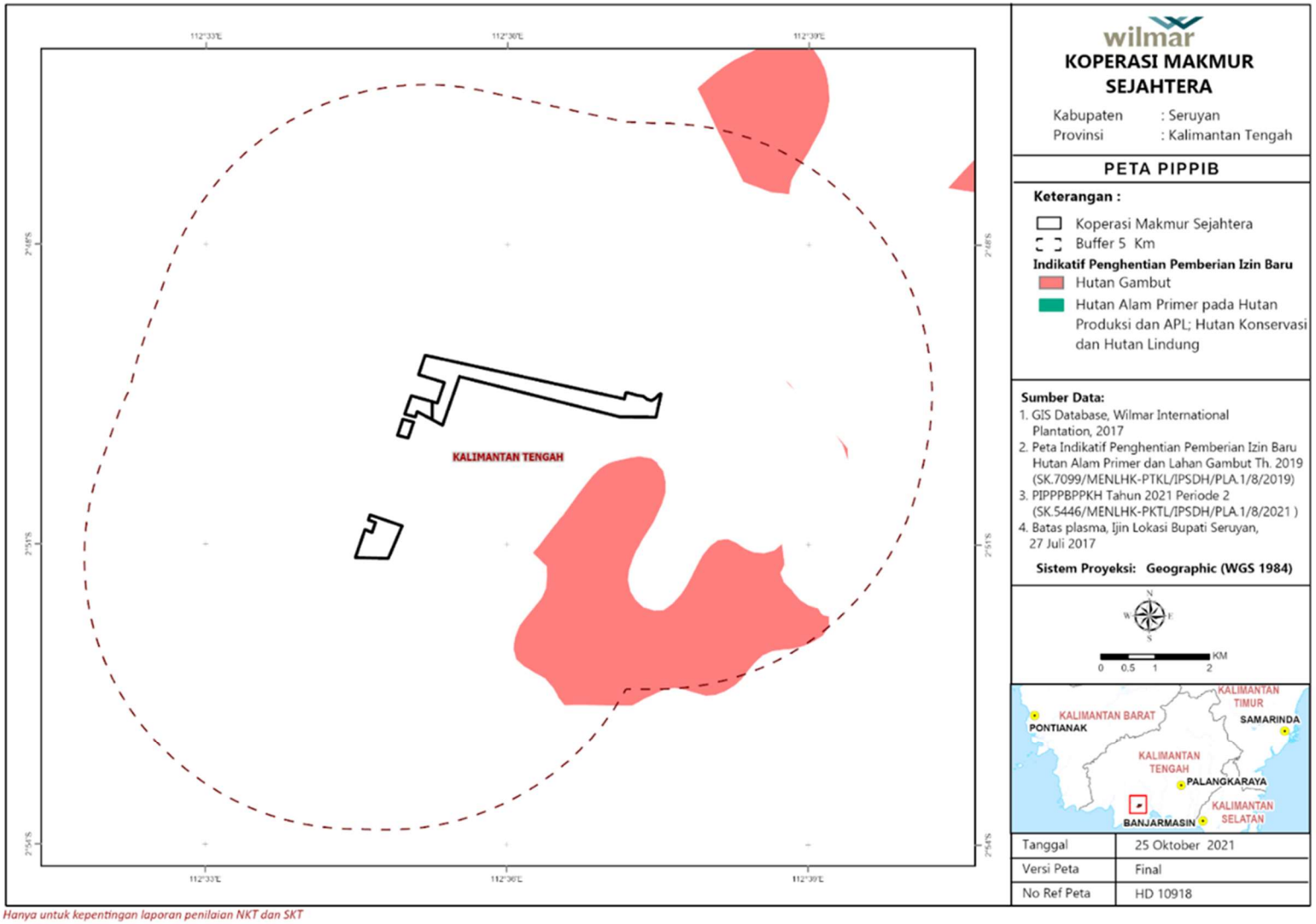
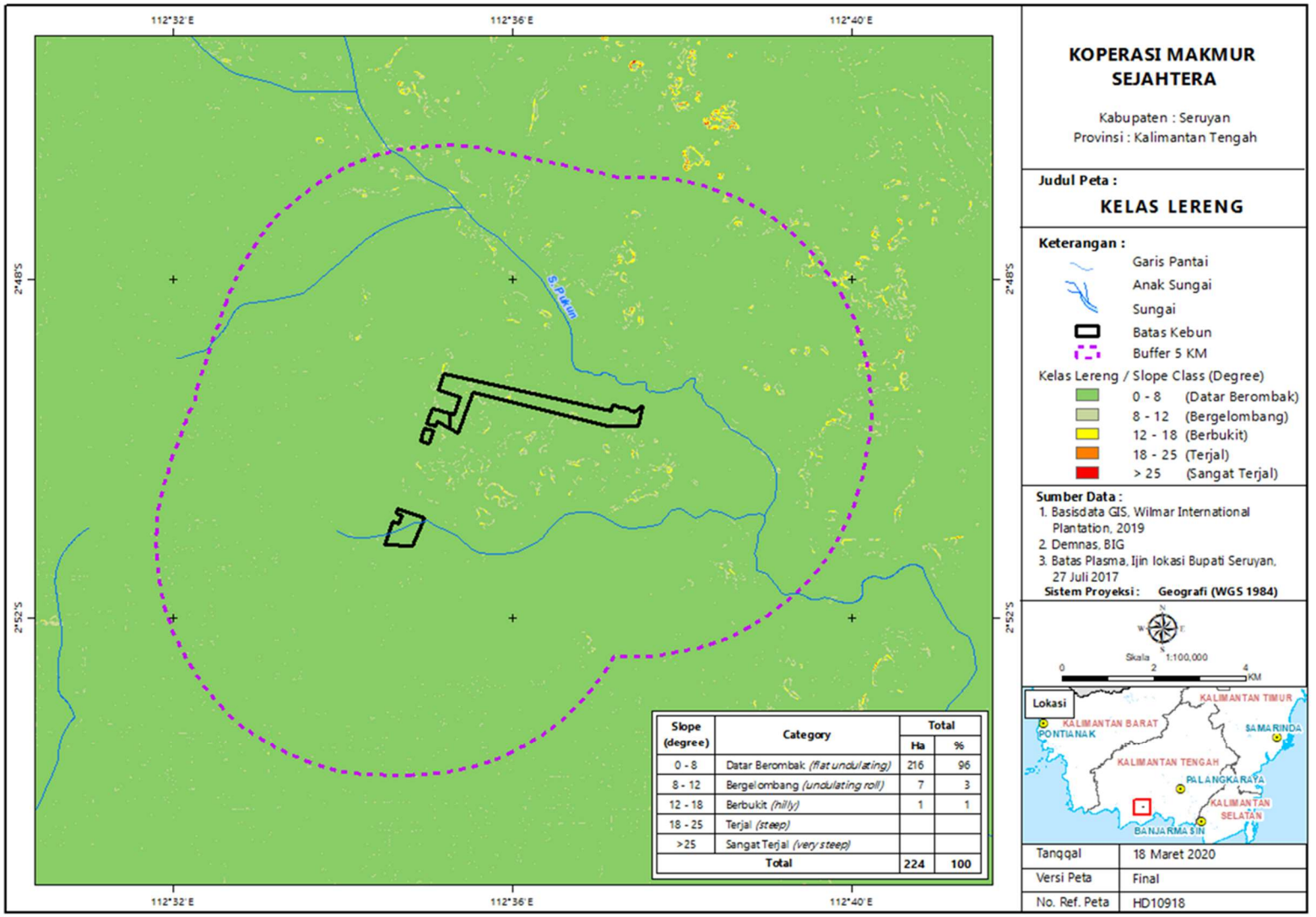


Figure 12. Map of Peat Distribution



Slope (degree)	Category	Total	
		Ha	%
0 - 8	Datar Berombak *(flat undulating)*	216	96
8 - 12	Bergelombang *(undulating roll)*	7	3
12 - 18	Berbukit *(hilly)*	1	1
18 - 25	Terjal *(steep)*		
>25	Sangat Terjal *(very steep)*		
Total		224	100

Figure 13. Slope Map

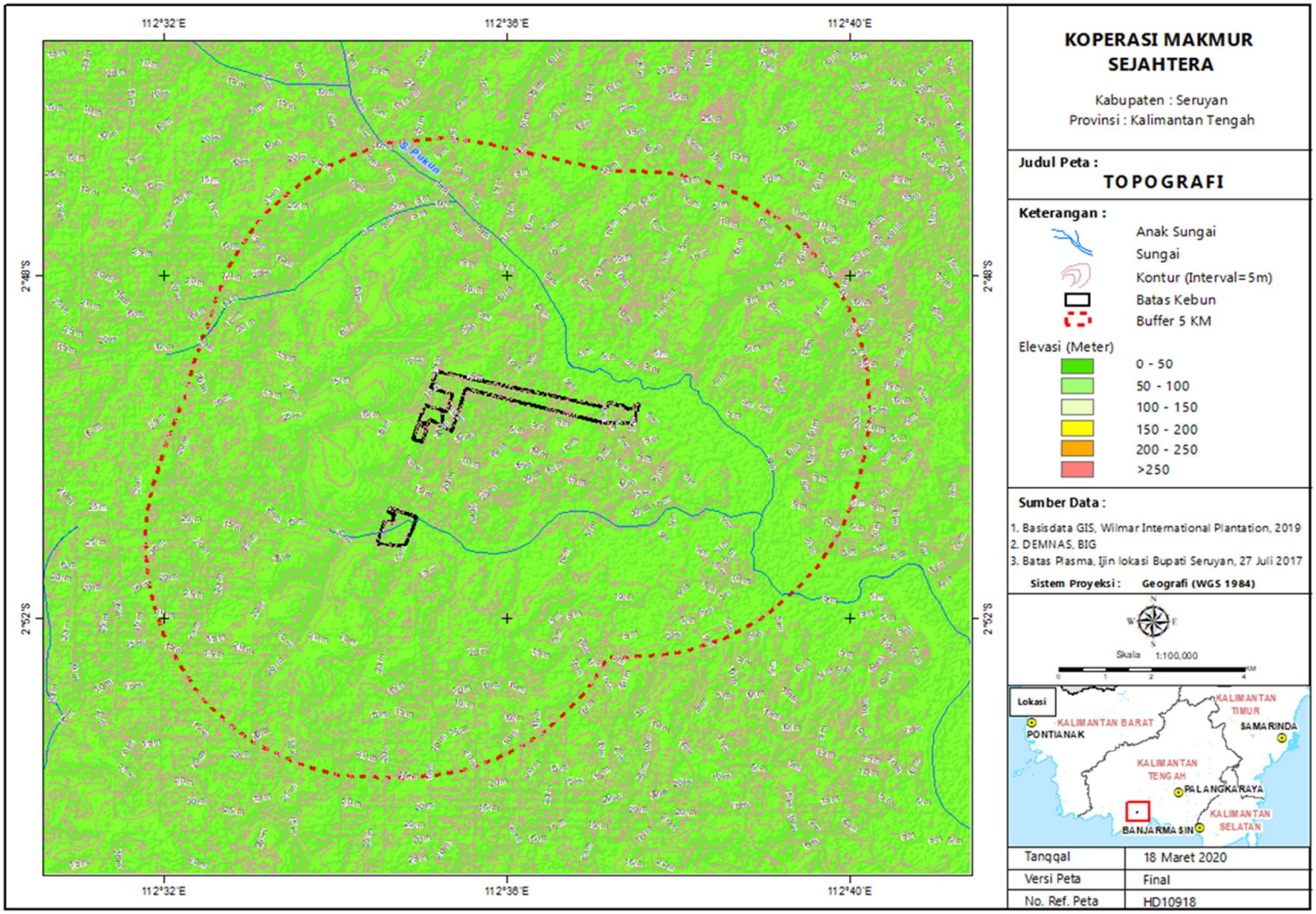


Figure 14. Map of Topography

3.4. GHG Assessment

3.4.1. Sources of GHG Emission

For new planting, sources of GHG emission can be calculated from (1) land clearing for new planting, (2) peatland planting, and (3) plantation operation for new planting.

The KMS carbon assessment is taken from HCS analysis that was conducted along with the integrated HCV and HCS study in KMS (2019). According to the study, types of vegetation within the concession are classified into four strata, which are Regenerating forest, Shrub land, open land (bush/grass land), and community oil palm plantations (oil palm). The carbon stock value for the community oil palm plantations strata was taken using an estimation approach to secondary data that was obtained from the standard value of the New Development GHG Calculator document (2021). Meanwhile, the carbon stock value for other vegetation uses data from the Integrated HCV/HCSA assessment report (2019) which can be seen in Table 37.

Table 37. Statistical value of carbon stock in each land cover class

Land cover class	Land cover class (Ha)	Carbon stock		Uncertainity (CI-95%)		Coefficient of Variation (%)
		Avg	***Std-error***	**Lower**	**Upper**	
Regenerating forest	26.54	25.31	4.78	33.2	50.13	90.91
Shrub land	78.97	3.77	7.71	-3.24	27.19	77.78
Open land	98.43	1.12	1.13	0.18	3.14	100
Community oil palm plantation	20.13	59.29	-		-	-

Based on data from the Center for Soil and Agro-climate Research (2000), the soil types in the KMS area are categorized as entisol and spodosol. From the distribution of soil types and also the New Permit Moratorium Indicative Map (PIPPIB) which described in the KMS Integrated HCV/HCSA Report (2019), it can also be seen that the KMS area is not in the peat soil zone.

The calculation of projected GHG emissions from new plantation management activities was carried out by referring to the existing management pattern in the company's plantation area as empirical data. The components considered in the calculation are plantation management components which are sources of GHG emissions, namely (i) fuel, (ii) fertilizer, and (iii) fruit productivity.

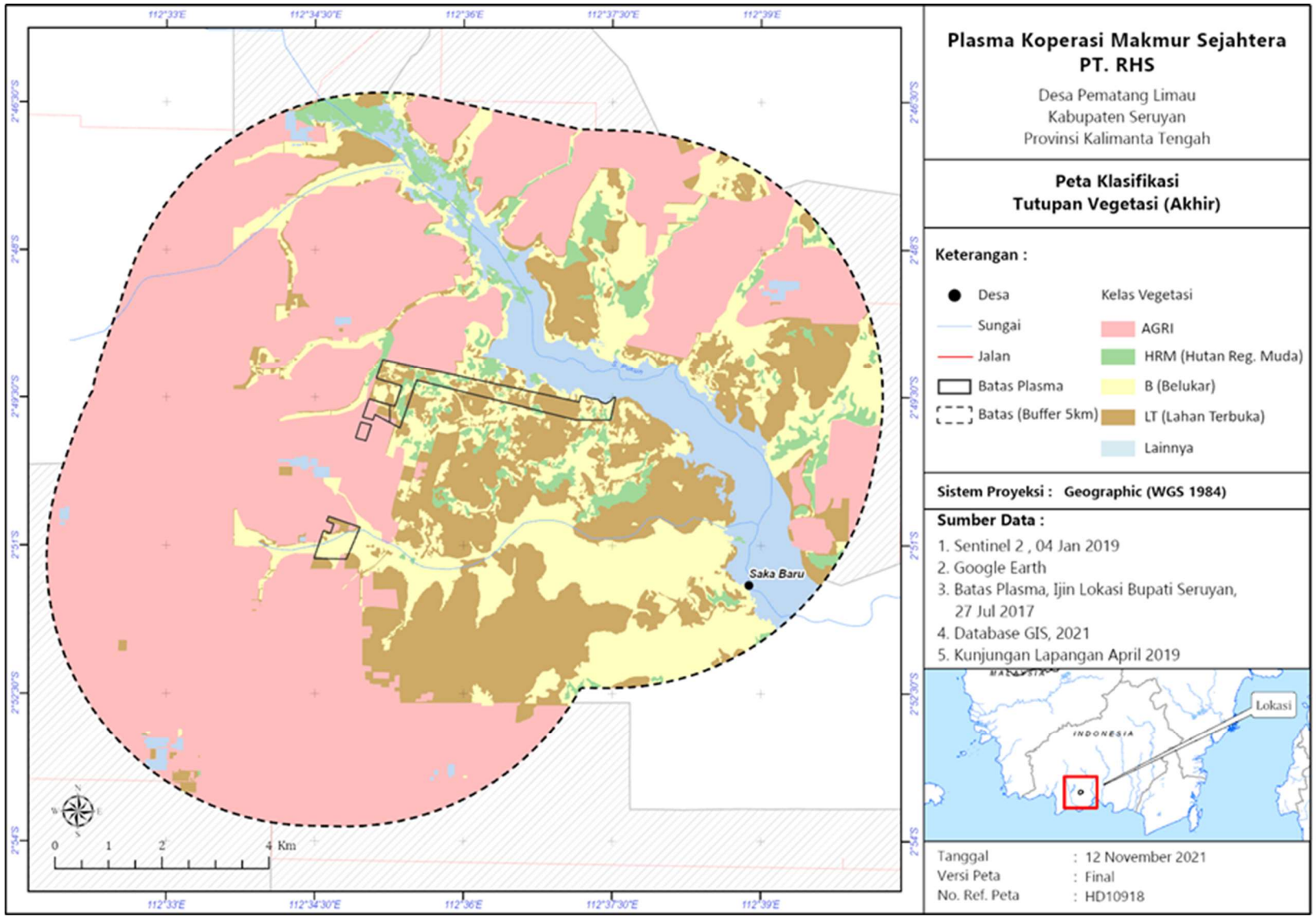


Figure 15. Map of vegetation cover density class in the Company's Operational Area

Table 38. Components in oil palm operation

No	Component	Unit
1	FFB Production	ton/ha/year
2	Use of fuel (diesel)	litre/year
3	Use of fuel (petrol)	litre/year
4	Use of fertilizer NPK	ton/ha/year
		ton/year
5	Use of fertilizer NK2	ton/ha/year
		ton/year
6	Use of fertilizer Kiesebor	ton/ha/year
		ton/year
7	Use of other fertilizer	ton/ha/year
		ton/year

Source: *RSPO New Development GHG Calculator* (2021)

3.4.2. Mitigation Scenarios for GHG Emission

Alternative Scenarios for New Plantation Development and Operation

The consideration of new planting plans as a component of measurable GHG mitigation efforts resulted in four development plan scenarios. These four scenarios continue to maintain the area identified as a conservation area in accordance with the results of the HCV identification so that these four scenarios have the same conservation credit value. The details of each scenario are presented on the table 33 below.

Table 39. Details of scenarios used in the development and management of new plantations

Scenarios		**Description**							
S1		fully use the existing area for oil palm cultivation							
S2		use only open land, shrubs (shrub) and land already planted with oil palm by the community for KMS oil palm planting							
S3		to use only open land areas and land that is currently planted with oil palm by the community for planting KMS oil palm							
S4		use only areas that are currently planted with oil palm by the community for KMS oil palm cultivation							
Treatment		**Scenario 1**		**Scenario 2**		**Scenario 3**		**Scenario 4**	
		Ha	tC/Ha	Ha	tC/Ha	Ha	tC/Ha	Ha	tC/Ha
Development Plan	*Regenerating forest*	26.54	25.31	0	25.31	0	25.31	0	25.31
	Shrub land	78.97	3.77	78.97	3.77	0	3.77	0	3.77
	Bush/grass land	96.83	1.12	96.83	1.12	96.83	1.12	0	1.12
	Oil palm	20.13	59.29	20.13	59.29	20.13	59.29	20.13	59.29
Carbon Sequestration		Ha	tCO_2/Ha	Ha	tCO_2/Ha	Ha	tCO_2/Ha	Ha	tCO_2/Ha
Conservation Area		1.60	2.5	1.60	2.5	1.60	2.5	1.60	2.5

GHG Emission Projection

The implementation of each scenario will result in different GHG emissions. The calculation results show that the implementation of scenario 1 can result in high sequestration but also high GHG emissions, where the land use for oil palm cultivation is the most optimal. Scenario 2 results in high sequestration and also results in high GHG emissions but land use for oil palm cultivation is not optimal. Scenario 3 results in high sequestration and relatively low emissions but land use is still not optimal. Scenario 4 resulted in the lowest sequestration and emissions, but the least optimal land use compared to other scenarios.

Overall comparison of emission values, GHG sequestration and net emission values from each scenario can be seen in the table 34 below.

Table 40. Comparison of projected net GHG emissions from each development scenario

Emission				
Source	**S1**	**S2**	**S3**	**S4**
Field emissions & credit (tonCO_2e)				
Land clearing	333.12	234.60	190.94	175.03
Crop sequestration	-1934.41	-1703.64	-1016.98	-175.03
Fertilizers	223.67	196.99	117.59	20.24
N_2O	146.90	129.37	77.23	13.29
Field fuel	97.28	85.67	51.14	8.80
Peat	0.00	0.00	0.00	0.00
Conservation credit	-4.00	-4.00	-4.00	-4.00
Net Field Emission	-1137.44	-1061.00	-584.08	38.33

3.4.3. Netto of GHG Emission

There are two types of dynamic sources of net GHG emissions identified in the planned area for new KMS plantations, namely emission sources and GHG fixation sources. Sources of emissions from new KMS plantations consist of (i) land clearing, (ii) use and transportation of used fertilizers, (iii) emissions of nitrous oxide (N2O) from fertilizer use, and (iv) use of fuel in plantations (field fuel); while the sources of fixation from plantation operations consist of carbon stocks and sequestration from plant biomass growth (crop sequestration) and conservation areas (conservation credit).

The calculation results show that the new KMS oil palm plantation will produce GHG fixation of 1934.41 tons of CO2e. There are four components of new plant maintenance that are sources of GHG emissions, however, the fixation value from biomass growth has a greater value. In the end, the total net GHG emissions of new KMS plantations is -5.11 tons CO2e/ha.

Table 41. Projected net GHG emissions from new KMS plantations

Sources	Total Emissions (t CO_2e)	Emission/Area (t CO_2e/ha)	Emission/Produced FFB (t CO_2e/t FFB)
Land clearing	333.12	1.50	0.07
Crop sequestration	-1934.41	-8.70	-0.42
Fertilizer	223.67	1.01	0.05
N2O	146.90	0.66	0.03
Fuel	97.28	0.44	0.02
Carbon sequestration on conservation areas (*conservation credit*)	-4.00	-0.02	0.00
Total	-1137.44	-5.11	-0.25

Notes:

Value (-) indicates carbon fixation

Analysis was carried out with the RSPO New Development GHG Calculator (2021)

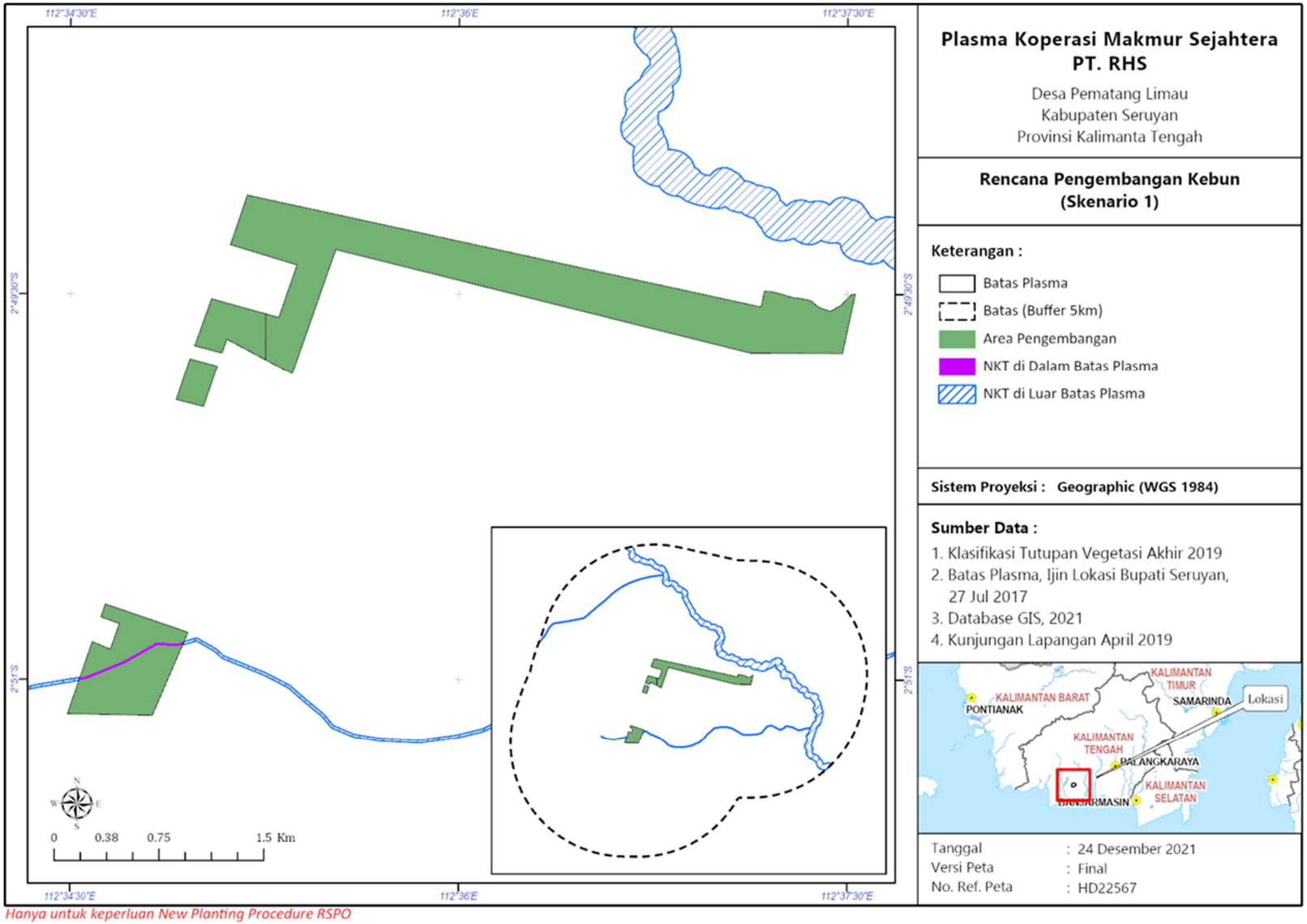


Figure 16. Map of Development Plan (Scenario 1)

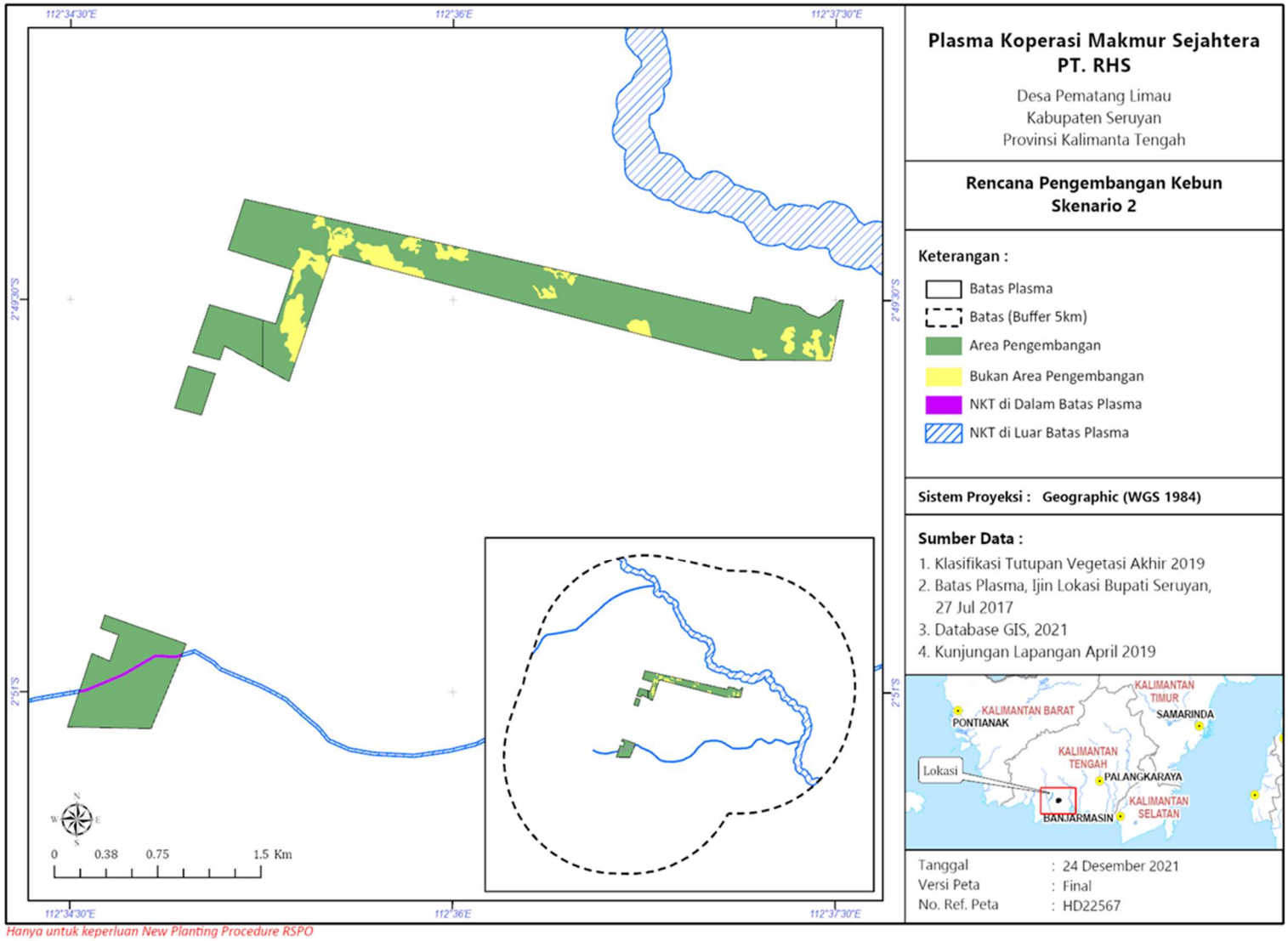


Figure 17. Map of Development Plan (Scenario 2)

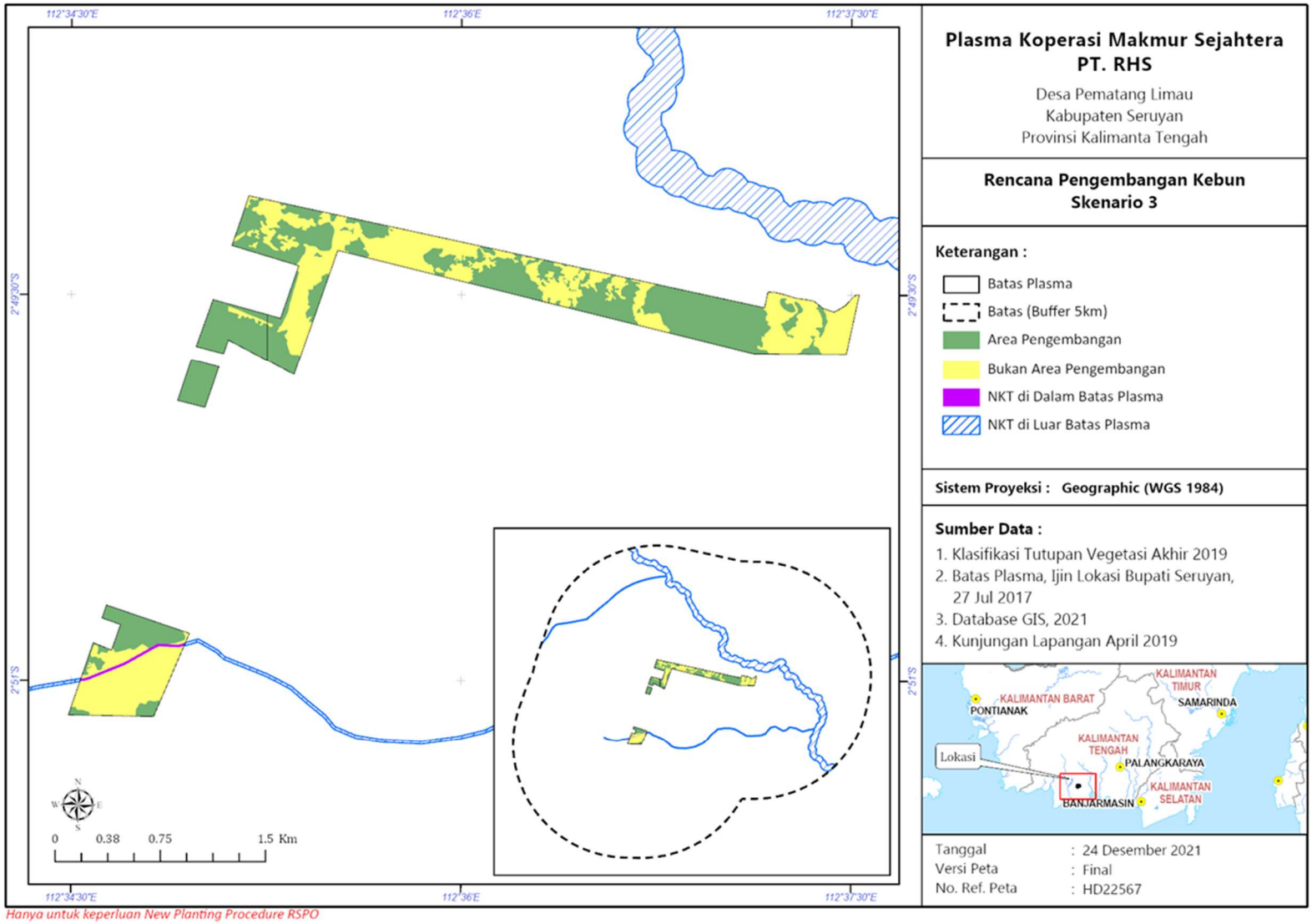


Figure 18. Map of Development Plan (Scenario 3)

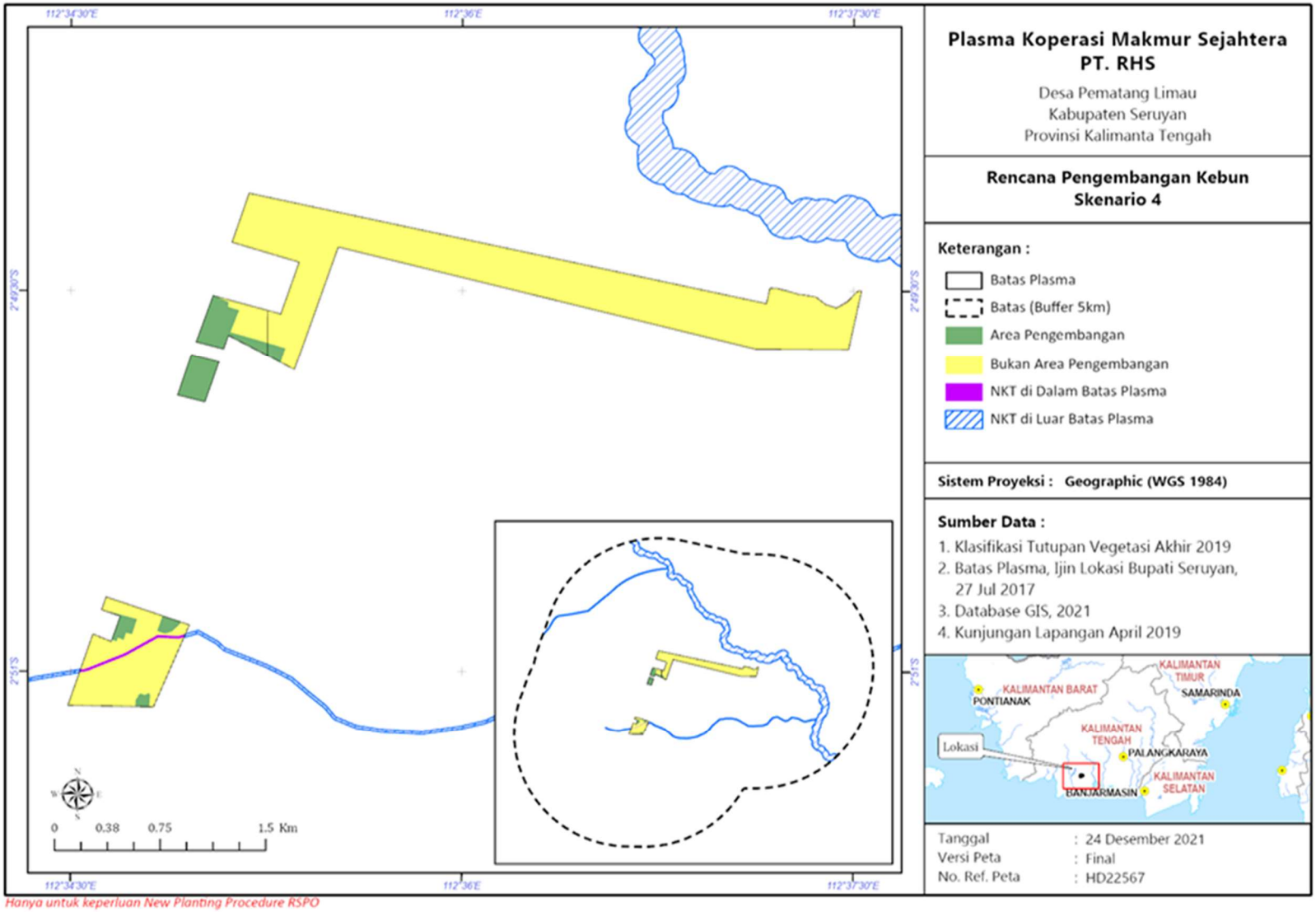


Figure 19. Map of Development Plan (Scenario 4)

From the result of analysis, can be concluded that the significant source of GHG emissions from the planned new planting of KMS comes from land clearing while the sources of GHG fixation consist of plant biomass growth and from conservation areas.

Based on the option of four scenarios, the company select the first scenario, because it has the most optimal value in terms of using the area for new oil palm plantings, and the resulting emission value has a fixation value that is greater than the emission value (as seen from the negative net GHG emission value). From the calculation results, the net GHG emission value for the first scenario is -1137.44 t CO2e or equivalent to -5.11 t CO2e/ha.

3.5. LUCA Assessment

Based on the imagery analysis, it can be seen that during the period 2005-2021, there were five land cover classes identified in the KMS plasma:

1) Regenerating forest
2) Shrub
3) Open Land
4) Other agriculture (community oil palm plantations)
5) Water body

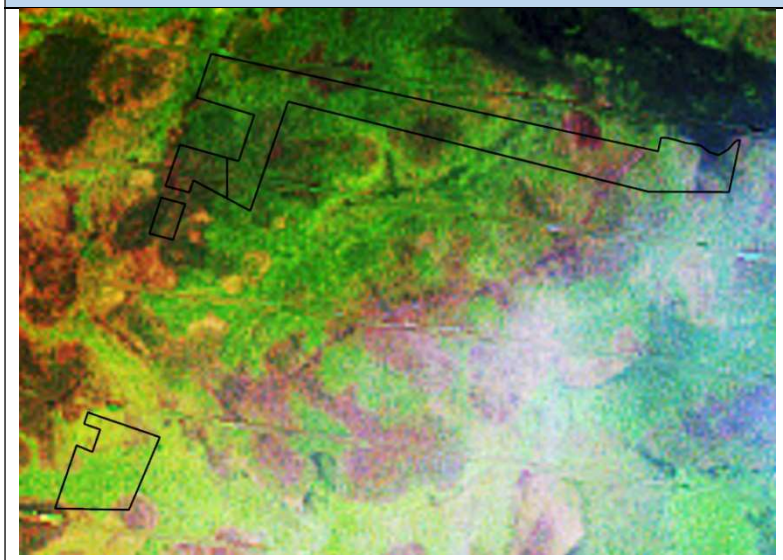
During that period, the identification of the presence of a significant water body occurred in 2010, where from the analysis of satellite imagery, it was identified that 7.83 ha of the KMS plasma area had changed into a water body. This is possible due to the overflow of rainwater at the eastern end of the concession, so that the area is inundated with water. In other periods, land cover in the form of water bodies is no longer identified.

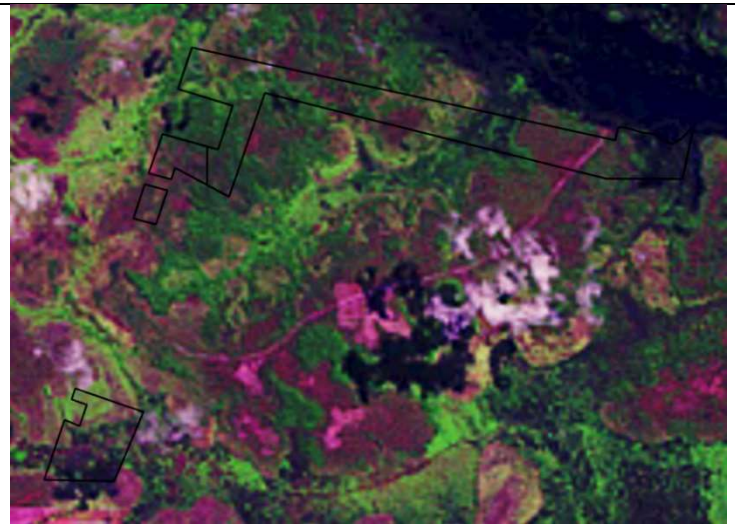
Overall, there were no land clearing activities by PT RHS or KMS management in the KMS plasma area. This is indicated by the commitment to postpone the clearing of new land, issued by the KMS management and also the management of PT RHS.

During the interview process with local communities and company employees around the KMS plasma area, they also explained that the clearing of the area within the KMS plasma area had occurred since 1997. This is because the area in the KMS plasma is mostly shrubs due to a major fire in 1997. Changes in land cover was not caused by the company's activities, but the activities of the people who own the land. This is reinforced by data from participatory mapping with the community as well as land tenure studies that have been carried out by PT RHS management and KMS management during the land acquisition process.

Table 42 shows a comparison of land cover changes for each period. The left side of the table depicts remote sensing images using Landsat 30m resolution. The right side of the table depicts land cover data classified into land cover classes based on satellite imagery.

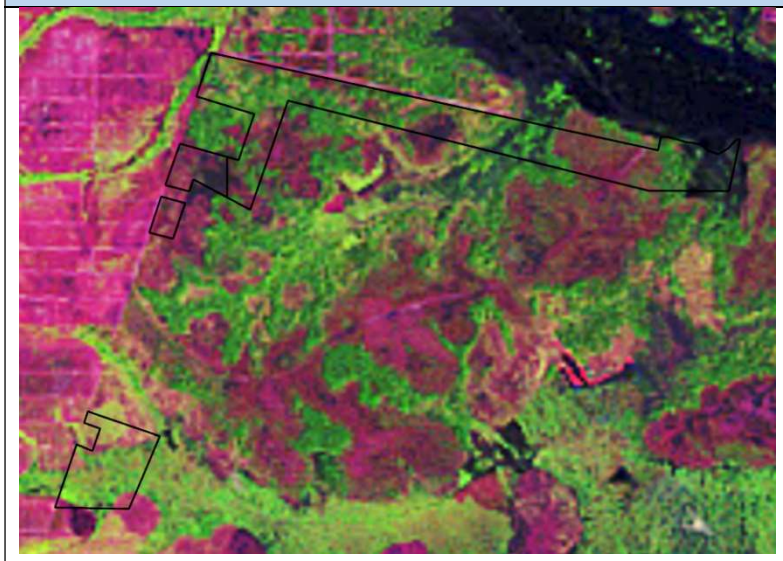
Table 42. Comparison of land cover changes

Imagery Map 2005	Imagery Analysis 2005
	
Imagery Map 2007	Imagery Analysis 2007



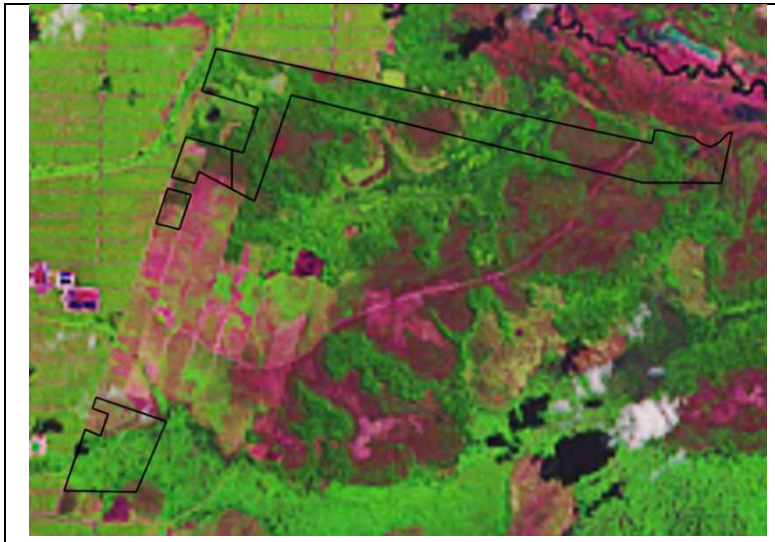
Imagery Map 2010

Imagery Analysis 2010

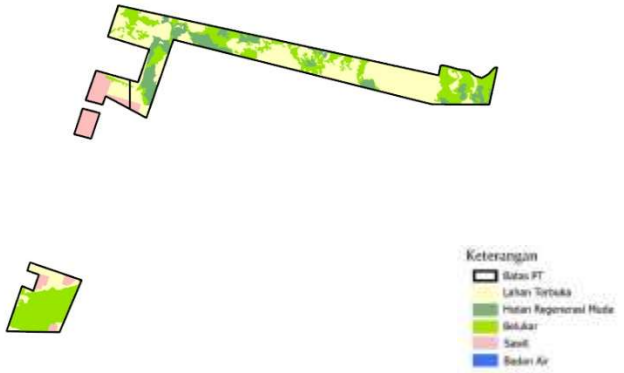
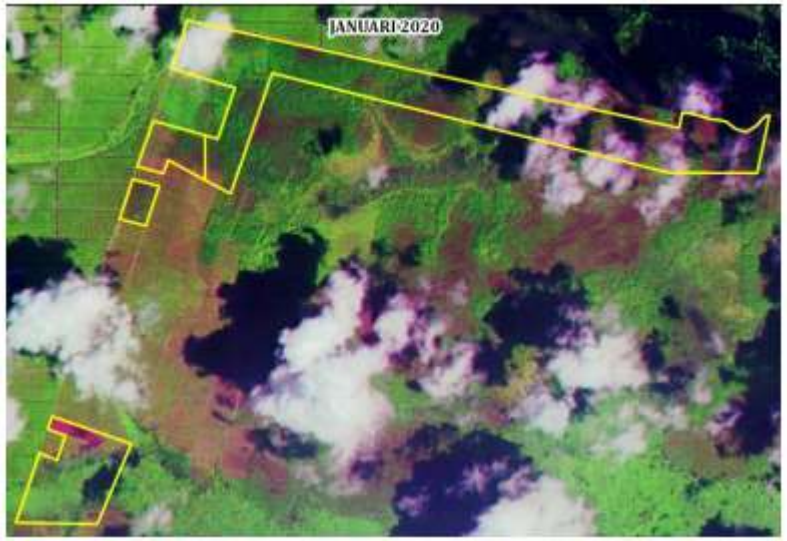
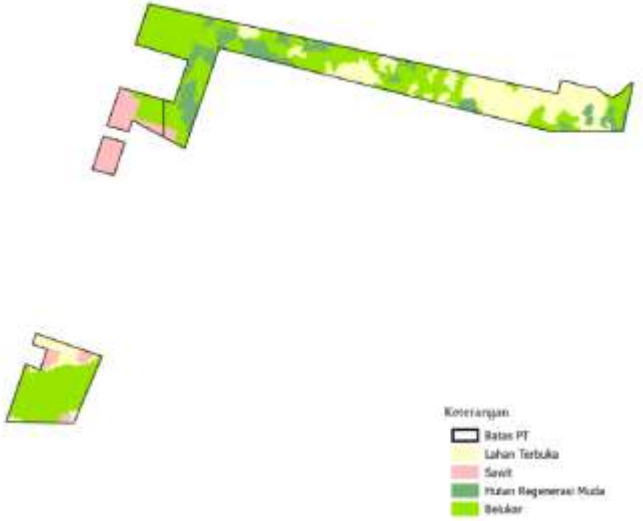


Imagery Map 2014

Imagery Analysis 2014




Keterangan
Batas PT
Lahan Terbuka
Hutan Regenerasi Muda
Belukar
Sawit
Badan Air

Imagery Map 2019	Imagery Analysis 2019
	
Imagery Map 2020	**Imagery Analysis 2020**
	

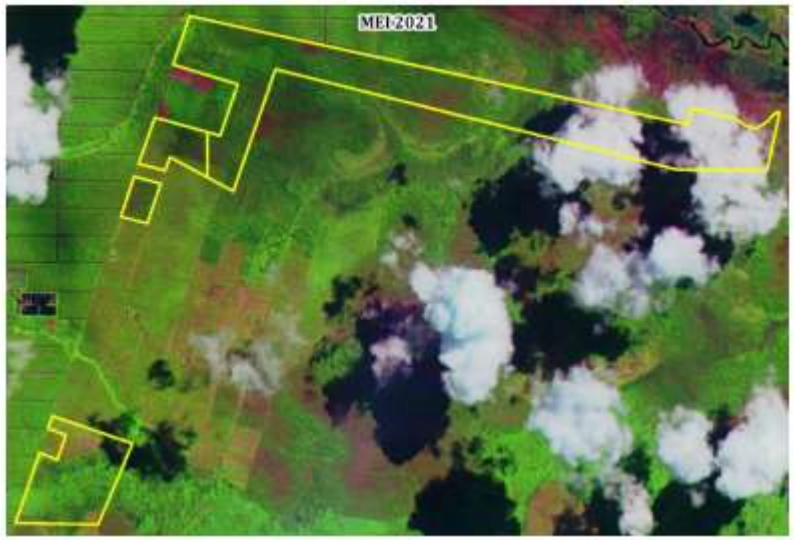
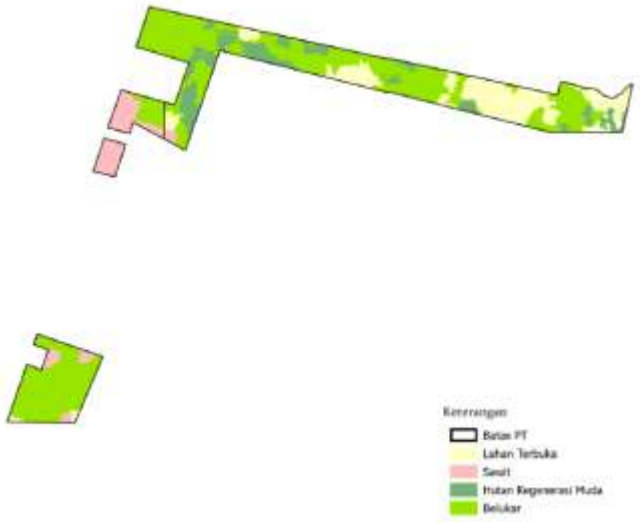
Imagery Map 2021	Imagery Analysis 2021
	

Table 43. Land cover change 2005 – 2019

Land Cover	2005	2007	2010	2014	2019	2020	2021
Regenerating forest	77.26	65.66	48.83	40.73	26.54	26.54	26.54
Scrub	100.19	79.84	75.70	103.02	78.97	117.42	131.41
Opened Land	46.61	78.56	91.70	80.31	98.43	59.98	45.99
Oil Palm Plantation	0	0	0	0	20.12	20.12	20.12
Water Body	0	0	7.83	0	0	0	0
Total	**224.06**	**224.06**	**224.06**	**224.06**	**224.06**	**224.06**	**224.06**

Significant land cover changes also occurred in 2014 – 2019, where there were oil palm plantations planted by community land owners before this area was planned as a plasma plantation. The planted area of oil palm plantations is 20.12 ha. According to the imagery between 2005 – 2014 and community interview, land cover in those particular area was open land and the palm was planted since 2015.

The results of the land cover analysis showed that there were no significant land changes during the period 2005 – 2019. There was no land clearing carried out by the company or KMS plasma management. Land clearing for oil palm plantations by the community is also carried out in open land areas, so it is included in the 0 coefficient category or zero liability.

In the period 2020 – 2021, a significant difference is found in scrub land cover and open field. The area of shrubs in 2020 is 117.42 ha, while in 2021 to 131.41 ha. The addition of scrub area in 2021 comes from open land cover an area of 20.30 ha. This indicates that the KMS management and PT RHS management are still committed to delaying land clearing before the HCV and HCS study process, as well as NPP completed.

3.6. FPIC

3.6.1 Participatory Identification of Local People's Land & FPIC Process Documentation

The KMS location permit area is an area with a long history of occupancy. Some of the land within the concession is still in the form of community cultivation land, especially in the form of oil palm plantations. Almost the entire area has been cleared or was once controlled by the local community. In detail the use of space/land use can be seen in Figure 20 below.

In the context of the pattern of ownership and use of natural resources (land). All land ownership is controlled by local (indigenous) communities. Ownership of land to indigenous peoples, usually obtained by land clearing and legacy.

From the results of the tenure study, according to information from village residents and community leaders at the time of the interview, there was no claim to land ownership in the prospective KMS plasma area.

At the time of the joint survey with the community, no land claims were found in the KMS concession. Based on the FGD or discussions through the FPIC or FPIC process, the land in the prospective KMS plasma has clear ownership status and there are no overlapping cases.

Some of the land in the KMS area is still being acquired by villagers for farming and gardening purposes. In relation to land acquisition, KMS has also involved the community in mapping community land within the concession area from the very beginning of the plasma development plan. It is important to ensure that the local community understands the objectives and impacts, both positive and negative, before giving approval to the land acquisition to be carried out.

To start the opening of plasma plantations, KMS first conducts socialization including regarding land compensation or what is commonly referred to as Crop Compensation (GRTT). According to residents, the release/acquisition of land by the company started in 2016.

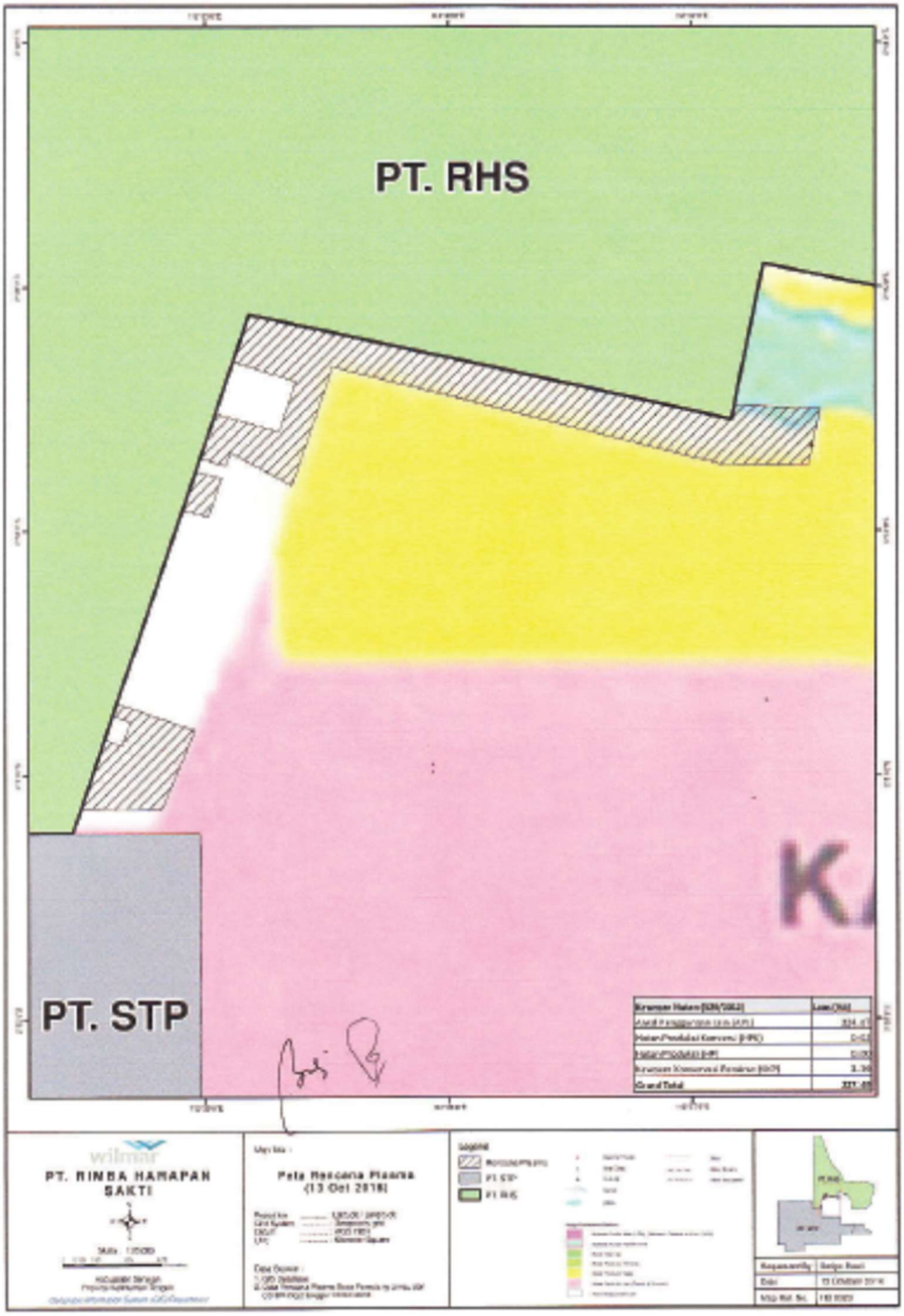


Figure 20. Map of Land Use and Land Rights Objects in KMS

4.1. Team Responsible for Developing Management Plans

Plasma Koperasi Makmur Sejahtera under the management of PT Rimba Harapan Sakti – Wilmar International is committed to carrying out management functions of this plantation development plan, following the provisions of the RSPO Principle & Criteria and in accordance with No Deforestation, No Peat, No Exploitation (NDPE) Wilmar's policy. The operation and sustainability unit has the overall responsibility on implementing the management plans as summarized on the Table 44 below.

Table 44. Internal Responsibility for Management Plans

Position	Responsibility
Indonesia Sustainability Lead	Ensure annual monitoring is conducted and reports are reviewed and compliant to the management plans within this report.
General Estate Manager	Ensure all resources as necessary are provided for effective implementation of the management recommendations.
Plasma	Ensure all management recommendations as communicated by Sustainability Manager and this report are implemented.
Sustainability Coordinator	Ensure all management recommendations as communicated by Sustainability Manager and this report are implemented.

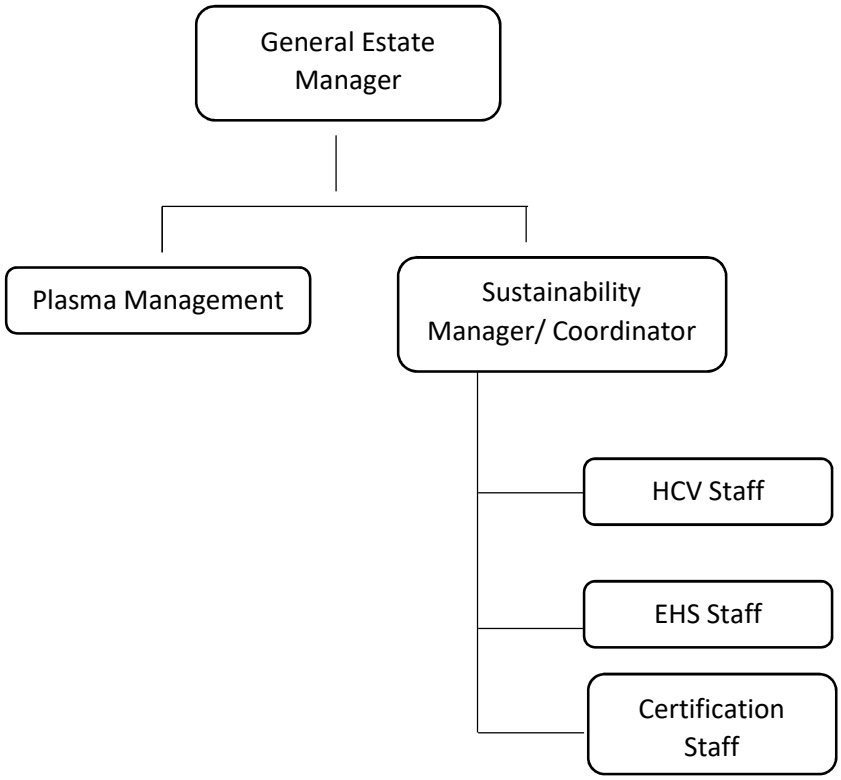


Figure 21. Organizational Structure for Internal Responsibility of Management Plan

4.2. Elements to be included in management plans

4.2.1. Environmental Management Plan

The Plasma KMS has developed mitigation plans to promote the environmental positive impacts or to minimize the environmental negative impacts than can be potentially generated from the new development activities. The steps taken in the EIA development and preparation of management & monitoring plans are presented on Table 45.

4.2.2. Social Management Plan

The Plasma KMS has developed mitigation plans to minimize the potential social negative and to enhance the positive impact. The management plans have been set out with involving relevant stakeholders in the appropriate time. The details of Social Management Plans are presented on the Table 46.

4.2.3. ICLUP and Integrated HCV-HCS

With this HCV and HCS study, there are potential HCV areas that that need to be protected, which found within the plasma concession (Saka Baru River), as well as the potential for HCV 1, HCV 4, and HCV 5 found outside the plasma concession (Pukun River). The existence of

this identified area is very important to be participatory managed, including by the management of plasma KMS, PT RHS, as well as the community and other stakeholders. This is as an evidence of the commitment from the management of plasma KMS and PT RHS, to contribute on the biodiversity conservation and reduce emissions by managing sustainable plantations. Management of identified HCV areas will be very beneficial and can contribute on the biodiversity protection and reduce greenhouse gas emissions at site, national and global levels.

Management of HCV area in KMS plasma cannot be separated from the multi-stakeholder's involvement, including community and government elements. This is considering that the existence of plasma KMS is an avalist from PT RHS. In the legality aspect, it must comply with the laws and regulations. In addition, the existence of the Pukun River which has potential as HCV 1, HCV 4, and HCV 5 also needs to be participatory managed in with other parties. Although the existence of the Pukun River is outside the plasma concession, the KMS management and plasma members also have an obligation to participate in maintaining and protecting the area, considering that the KMS plasma concession area is adjacent to the Pukun River.

The existence of HCV areas in the KMS plasma which is an area of Other Use Areas (APL), also needs to get recognition from multiple parties, both the community and the government. For this reason, collaborative management with the community is needed, especially in HCV areas. As for legality, KMS plasma administrators need to coordinate and communicate with relevant government agencies to obtain regulatory recognition.

The HCV-HCS management plan covering all identified HCV areas (1.60 Ha). The conservation area is categorized as HCV 4, consists of a river border area which becomes an erosion control zone and prevents water pollution from the application of fertilizers and herbicides in the operational of plasma plantations. The details of ICLUP and integrated HCV-HCS Management plans are presented on the Table 47.

In general, the main threats in HCV and HCS areas are river bank erosion, land fires, chemical application in plantations (fertilizers and herbicides), and legumes (Mucuna bracteata). Based on the discussion with the KMS plasma plantation manager, the Mucuna bracteata species will be planted after the land clearing process. The purpose of this planting is to suppress weed growth, protect the soil from direct sunbeam and raindrops, reduce runoff and maintain soil moisture and increase soil fertility. However, legumes themselves are considered to be invasive species, because they have a fast growth rate and if not controlled can cover trees or natural vegetation. As a result, the photosynthesis process of trees or natural vegetation will be disrupted, and can cause the death of the tree or vegetation. Based on the results of discussions with the community

in Pematang Limau Village, the level of community dependence on the existence of forests and land in the plasma area is very low, because most of the community's livelihoods are private employees, civil servants and fishermen.

4.2.4. Soil Management Plan

Since there were no identified fragile nor marginal soils for Plasma KMS proposed new planting, hence no management and mitigation measures are required.

4.2.5. GHG Management Plan

Plasma KMS has identified the sources of emission of each new planting activity. Plasma KMS has also selected the best scenario alternative for mitigation purpose. Management plan has been set out to mitigate the GHG emission completed with time and PIC. The details of GHG Management Plans are presented on the Table 51.

Table 45. EIA Management Plan

Parameter to be Monitored	Proposed Enhancement / Mitigation Measures	Location	Measurement	Frequency	Responsibility
Positive or negative perception of society to oil palm plantation activity	Deliver clear and accurate information about the activity plan to the community, especially to the impacted community.	Local communities Of Pematang Lima Village, Seruyan Hilir District, Seruyan Regency	There are positive or negative perception of society to the plasma operation	1 (one) time before commencing activity.	Plasma KMS through Avalis
Increasing work and business opportunities for the community around the location, Increasing Income and the emerging of public anxiety	Establishing procedures of recruitment. Publishing recruitment announcement near/surrounding community location. Minimizing the conflict occurrence in time of labor recruitment. Making collaboration with Village & district parties in labor recruitment. - Number of non-employees skills (maid helper and night keeper) are being	Local communities Of Pematang Lima Village, Seruyan Hilir District, Seruyan Regency	Total of local worker minimum 70%. No conflict related with labor New business opportunities for Community around.	At the time of labor recruiting for construction activity.	Plasma KMS through Avalis

Parameter to be Monitored	Proposed Enhancement / Mitigation Measures	Location	Measurement	Frequency	Responsibility
	prioritized over workers local.				
Decrease of air quality as a result of increasing dust and exhaust gas vehicle. Increasing of noise level.	All transportation operators must comply with all rules and procedures. Develop procedures of machine unloading, equipment and factory materials. Inspection of all the equipment used. Wear protective equipment (PPE) in accordance with the type of work. Provision of first aid on the work location. The issuance of labor social security (jamsostek).	Around the location / settlement with soil road and intens mobilization.	The decrease of air quality and noise level can be controlled not excessing standard of Air Quality and noise level Ambient.	During engine, equipment and material mobilization activities.	Plasma KMS through Avalis

Parameter to be Monitored	Proposed Enhancement / Mitigation Measures	Location	Measurement	Frequency	Responsibility
Increasing dust due to material transfer heap. Decreasing water quality. Decreasing of flora and fauna around location activity.	Activities are not carried out when it rains. Watering the open land and on the road traversed by vehicle around the site project. Wearing PPE for operators working on location.	Road construction, drainage and Manuring location.	No dust level exceeds standard air quality ambient Increase level of TSS and TDS of nearby rivers not more than 10% Loss of natural flora on land used for development roads and drainage channels	During activities take place.	Plasma KMS through Avalis
Land Fires	Construction of a fire watch tower and provide firefighter equipment.	Location for land preparing	No land fires	During land clearing activities take place.	Plasma KMS through Avalis
River pollution due to spraying and fertilizing activity Decreasing of fish species in rivers around the	Using chemicals allowed based on regulation. Using the chemicals type and dose according to regulation. Develop spraying and fertilizing SOP.	Immature plant location in KMS	River water quality around location of fertilization and spraying activity. Absence of decrease in fish quantity.	During manuring activities take place.	Plasma KMS through Avalis

Parameter to be Monitored	Proposed Enhancement / Mitigation Measures	Location	Measurement	Frequency	Responsibility
immature plants location. Community anxiety living on the upstream location. Hazardous pollution from pesticide and fertilizer ex package.	Develop hazardous management SOPs. Build hazardous temporary storage and management according to applicable regulations.		Absence the public's anxiety living along the river. Hazardous waste well managed.		

Table 46. SIA Management Plan

No	Impact Parameter	Source of Impact	Management Plan	Location	PIC	Period of Management
1	Work Opportunity	1. There is an activity plan for smallholder's business.	1. Making smallholder business development plans 2. Taking into account	Pematang Limau Village	Smallholder management/ staff	Yearly

		2. The existence of smallholder's business capital.	labor needs to run smallholder business development			
2	Mechanism of consultation and communication	1. Information is difficult accepted by society 2. Coordination and communication between Cooperative management with members. 3. Coordination and communication between Cooperative management with the avalist.	1. Creating a mechanism for Cooperative consultation and communication 2. Creating a Communication forum with PT. Rimba Harapan Sakti.	Pematang Limau Village	Smallholder management/ staff Smallholder Dept PT. RHS	Yearly
3	Business Opportunity	There is a reserved fund Cooperative business from the results of division allocation plasma advantages.	1. Making Cooperative New business development Plans. 2. Ensure business co-op goes well. 3. Creating programs	Pematang Limau Village	Smallholder mangement/ staff	Yearly

			training / technical guidance for increase HR Cooperative management can run a business Cooperative.			
4	Regional income	1. Cooperative Obligations to the country	Execution of all financial obligations to countries such as taxes, retribution etc	Seruyan District	Koperasi PT RHS	Yearly
5	household income	1. Profit sharing smallholder advantage 2. Profit sharing Cooperative advantage (SHU) 3. Business activities Cooperative.	Carry out monitoring to increase household income periodically. Method/ barometer income is taken from District/BPS	Pematang Limau Village	Koperasi PT RHS	Once in 2 years
6	Institutional	1. Smallholder Partnership activities. 2. New business development	Establish a communication forum between the Cooperative and the	Pematang Limau Village	Koperasi PT RHS	Yearly

			avalis PT. RHS. Establish a farmer group / cattle farmer group.			
7	Community Perception	1. Smallholder Partnership activities 2. Allocation of Cooperative social funds	Build community trust for joining Cooperative member with socialization smallholder program and Cooperative business clearly to the public. 2. Running a Cooperative business honesty and transparency. 3. Creating programs competency improvement administrator in managing Cooperative. 4. Carry out the transparency and	Pematang Limau Village	Koperasi PT RHS	Yearly

			openness principle in plasma partnership management and Cooperative activities.			
	Social and culture transformation	1. Plasma Partnership activities. 2. Cooperative business activities	Carry out monitoring new habits / new emerging culture from plasma partnership activities and Cooperative business activities	Pematang Limau Village	Koperasi PT RHS	Yearly
	Social Health	1. Environment sanitary conditions 2. New activities on Cooperative business development	1. Gotong royong program for cleaning up the environment and sanitation in the village. 2. Partnering with clinic company for carry out the program environment health socialization		Koperasi PT RHS	Monthly & Yearly

Table 47. HCV-HCS Management Plan

Value Identification	Threats	Recommendation for Management	Recommendation for Monitoring	Timeline for Monitoring	PIC
HCS forest	NA	NA	NA		
HCV 1 **Pukun river**	Hunting	1. Socialization of wild flora and fauna species including CR / Critically Endangered (critical), rare and protected. 2. Outreach to the community regarding the importance of preserving HCV areas including the preservation of wild plant and animal species including CR / Critically Endangered (critical), rare and protected. 3. Coordination with related agencies/stakeholders,	1. Monitoring of flora and fauna within the plasma plantation 2. Monitoring of HCV threat, including hunting 3. Monitoring of community understanding on the RTE/protected flora and fauna conservation	1. Annually 2. Monthly 3. Annually	1. Estate Manager 2. Public Relation Team 3. HCV Team

Value Identification	Threats	Recommendation for Management	Recommendation for Monitoring	Timeline for Monitoring	PIC
		considering that the area is located outside the concession			
HCV 4 Saka Baru River	1. Fire 2. Erossion 3. Chemical application (fertilizer and herbicide) in the riparian zone 4. Legume cover 5. crop invasion	1. Participatory HCV boundary marking 2. Maintenance of the marking 3. Socialization of the marker and HCV area to the contractor staff who will conduct land clearing 4. HCV protection (signboard installment and patrol) 5. Prevention and control of the threats such as chemical	1. HCV threat monitoring 2. Monitoring the understanding of contractor staff and plasma managers related to HCV area boundaries through outreach programs, as well as fire prevention and control, illegal logging and encroachment 3. Erosion monitoring 4. Water quality monitoring	1. Monthly 2. Annually (will be ended once the contractor's project is completed) 3. Semiannually 4. Semiannually 5. Monthly 6. Monthly 7. Daily during dry season	1. Estate Manager 2. Conservation team

Value Identification	Threats	Recommendation for Management	Recommendation for Monitoring	Timeline for Monitoring	PIC
		application and legume cover crop in Saka Baru river 6. Revegetation of the Saka Baru river 7. Installment of fire alert signboard Conduct socialization to the plasma worker and community Develop fire mitigation system, such as fire tower, bore hole, and water reservoir	5. Monitoring of chemical application 6. Monitoring of legume cover crop in Saka Baru river 7. Increase patrols during the dry season		
HCV 5 **Pukun river**	Potental chemical application flow from Saka Baru river	1. Installment and Maintenance of boundary markers in the Saka Baru river as the confluent of Pukun river.	1. HCV threat monitoring in Saka Baru river 2. Monitoring the understanding of contractor staff and	1. Monthly 2. Annually (will be ended once the contractor's	1. Estate Manager 2. Public Relation Team 3. HCV Team

Value Identification	Threats	Recommendation for Management	Recommendation for Monitoring	Timeline for Monitoring	PIC
		2. Socialization of boundary markings and HCV areas to staff of contractors and companies that handle road and other facilities construction 3. Prevention and control of disturbances to Saka Baru river that flows to Pukun river (forest and land fires, application of chemicals near river buffers, and legume cover crop) 4. Rehabilitation and enrichment planting in Saka Baru river	plasma managers related to HCV area boundaries through outreach programs, as well as fire prevention and control, and encroachment 3. Erosion monitoring in Saka Baru river 4. Water quality monitoring in Saka Baru river 5. Monitoring of chemical application in Saka Baru river 6. Monitoring of legume cover crop which located near with Saka Baru river 7. Increase patrols during the dry season	project is completed) 3. Semiannually 4. Semiannually 5. Monthly 6. Monthly 7. Daily during dry season	

Value Identification	Threats	Recommendation for Management	Recommendation for Monitoring	Timeline for Monitoring	PIC
		that flows to Pukun river 5. Coordination with related agencies and other stakeholders, considering that Sungai Pukun is located outside the concession			

Based on the results of discussions with the community in Pematang Limau Village, the level of community dependence on the existence of forests and land within the company's area is very low, because most of the community's livelihoods are private employees, government officials, civilians and fishermen. Threat details and management recommendations are shown in Table 32.

Table 48. Threat Assessment

Stressor	Stress	Source	Management Plan
Chemist application	Water pollution and flood	Internal	Installing signboard of water source information
			Ensure that there is no chemical activity in water bodies and their buffer areas
River erosion	The occurrence of flooding and river silting	External and internal	Installing a river presence information board
			Planting trees in buffer areas to minimize erosion
Land fire	The damage of HCV & HCS area	External and internal	Installing a land fire hazard level information board
			Socializing the dangers of fire to plasma employees and the public
			Increase patrols in the dry season
			Build a land fire mitigation system, such as making monitoring towers, drilled wells, and water reservoirs.
Invasif Plants	The damage of HCV & HCS area	Internal	Periodic cleaning of weeds from HCV and HCS areas

Table 49. HCV and HCS area threat analysis

Targets	Threats	Damage Form	Damage Level	Cause of Damage	Contribution to damage
Saka Baru River border	Erosion and chemical application	- The erosion of soil on the river border which	Medium	Loss of vegetation on river borders	Medium

Targets	Threats	Damage Form	Damage Level	Cause of Damage	Contribution to damage
		results in silting of the river - Polluted river water		Application of chemicals on riverbanks	
Plantation land and river border area	Land fire	Burning areas of open land, thickets and forests	Medium	Dry areas in the dry season result in very low humidity levels in this location so that the high potential for forest fires in this area is supported by the high human activity in this area for hunting activities.	Medium
Protected Wildlife	Habitat loss	The decrease in protected species	Low	Loss of habitat for roosting. However, there are potential new food sources (rats, snakes) from plasma plantations	Low

Table 50. Experts and stakeholders contacted/consulted during the scoping study

Name	Tittle/Role	Organisation/Social Group	Key concerns and recommendations
Edianto	Asistant General Manager PT RHS	PT RHS	This plasma has been planned since 2010, when Mr. Beni Rosa was a BM. If it doesn't work until now, the plasma team should have been evaluated. If possible, the

			HCV/HCS study will be processed as soon as possible, and then community can immediately develop the plasma land. Previously, the issue was land legality, which is now settled. I hope all the study process will be expedite shortly.
Name	**Tittle/Role**	**Organisation/Social Group**	**Key concerns and recommendations**
Setiyo Budi	Plasma Manager PT RHS	PT RHS	This plasma is very usefull for community of Pematang Limau, because they can get economy benefit from the plantation. This HCV/HCS study should be completed immediately, to accelerate plasma development.
Agustinus Purba	Group Estate Manager PT RHS	PT RHS	PT RHS in principle will continue to support this assessment, as part of the precautionary approach on the plasma development. It's also important as the implementation of Wilmar NDPE policy.
Jailani	Head of village Pematang Limau	Village government	This plasma program has been planned since the previous Kepala Desa, but until now is not realized yet. The plasma had granted a location permit from government, so it should be processed immediately. However, as the village government, we understand that this process should be carefully and we will support for HCV and HCS assessment.
Adriyani	Koperasi Makmur Sejahtera Chairman	Cooperative	Landcover around the plasma area was dominantly open land and shrub. Trees that can be found are quite small, and current landcover is not different with the landcover in the past. Hystorically, no big-trees in the forest

			area, because typical forest Seruyan is similar. It was dominantly by small tree, or just a shrub. According to the previous survey, no peat in the plasma area.
Hardini	Head of Neighborhood Association (*Ketua RT*)	Woman Figure	This plasma will increase community income. Currently, community income only depends from working in the company, fishing, and gardening. With this plasma plan, each household will get additional money.
Suparlan	Warga	Community Figure	Sunga Saka Baru is located within the plasma area. This river must be protected, because all the rivers are important for living. At least we need around 10 meters of the buffer to protect the water. For the wildlife, I did not found any special so far. Usually only a small birds like Prinia and Spotted dove. For Orangutan or Bear, we never met them in the plasma. Potentiall it can be found in the PT RHS area, particularly within the forest along Sungai Pukun.

Table 51. GHG Management Plan

No	Source of Emission	Emission/ Sequestration	Type of Activity	Mitigation Action	Time/Frequency of Mitigation	PIC
1	Land Clearing	Emission	Land preparation and planting	1. Land clearing according to best plantation practices 2. Land clearing without burning	During land clearing and land preparation	Plantation Head / Smallholder
2	Fuel usage	Emission	Heavy equipment and transportation operations	1. Periodic maintenance of heavy equipment and transportation 2. Use of low emission fuel (biodiesel) 3. Carry out routine emission tests	1. According to the regular maintenance schedule and vehicle service book 2. Routine 3. In accordance with applicable regulations	Head of transportation
3	Use of fertilizer	Emission	Plant manuring	1. Perform routine leaf analysis 2. Implementation of fertilizer recommendations	1. Once a year 2. According to the recommendation of type, location and time of fertilization in the	1. EMU 2. Plantation Head/ Smallholder 3. He 4. Head of warehouse

				according to the results of leaf analysis 3. Application of fertilizer storage standards	fertilizer recommendation 3. Routine	
4	Use of Pesticides	Emission	Plant manuring	1. Routine EWS implementation 2. Herbicide application according to standard care rotation (weed control) 3. Application of insecticides, fungicides, and others according to the recommendations of the early warning system / EWS (control of plant pests and diseases) 4. Implementation of Integrated Pest	1. According to EWS schedule 2. According to crop manuring rotation recommendations 3. According to the recommended type, location and time of application in the EWS recommendations 4. Routinely according to the annual work program	1. EMU 2. Plantation Head/ Smallholder

				Management (IPM)		
5	HCV and HCS area	Sequestration	HCV and HCS Management	Management of HCV and HCS according to SOPs and functions. As well as implementing management and monitoring recommendations stated in the HCV and HCS identification reports	Routine according to the annual work program	HCV Officer
6	Oil palm growth and FFB production	Sequestration	Plant manuring	Plant manuring according to best agricultural practice in line with plant age group	Routine according to the annual work program	Plantation Head/ Smallholder

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5. INTERNAL RESPONSIBILITY

6.1. Formal Signing off by assessors and grower

The following assessors formally accept our interpretation of their findings and management recommendation as summarized in this report:

Assessment	Name of Lead Assessor	Signature
Integrated HCV-HCS Assessment	Syahrial Anhar Harahap	
Social Impact Assessment (SIA)	Iskandar Zulkarnain	
Environmental Impact	Yulian Mara Alkusma	

Assessment (EIA)		
Land Use Change Analysis (LUCA)	Syahrial Anhar Harahap	
GHG Assessment	Foo Siew Theng	
Soil and Topography Assessment	Septa Primananda	
FPIC	Maman Sucherman	

6.2. Statement of acceptance of responsibility for assessment and formal signing off of management plans

This document is the public summary of the integrated HCV & HCS, SEIA, GHG, LUCA & FPIC management for new developments at Koperasi Makmur Sejahtera and has been approved by management.

Group Estate Manager PT Rimba Harapan Sakti	Date
Lead of the Makmur Sejahtera Cooperative	Date