RSPO New Planting Procedure

SUMMARY OF ASSESSMENT REPORTS AND MANAGEMENT PLANS

PT Timbang Deli Indonesia

November 2017

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Chapter 1

Overview and Background

PT. Timbang Deli Indonesia has obtained the Land Right Title (HGU) license through the Decree of the Minister of Agrarian Affairs / Head of BPN RI No. 69 / HGU / BPN / 97 dated July 10, 1997 with the total area is 972.19 Ha. PT TDI is located in Sub-districts of Galang, Deli Serdang District, Province of North Sumatra, Indonesia. Geographically PT TDI is located at position 03^0 24' 58" – 03^0 28' 09" N and 98^0 53' 33" - 98^0 55' 03" E. (see Figure 1)

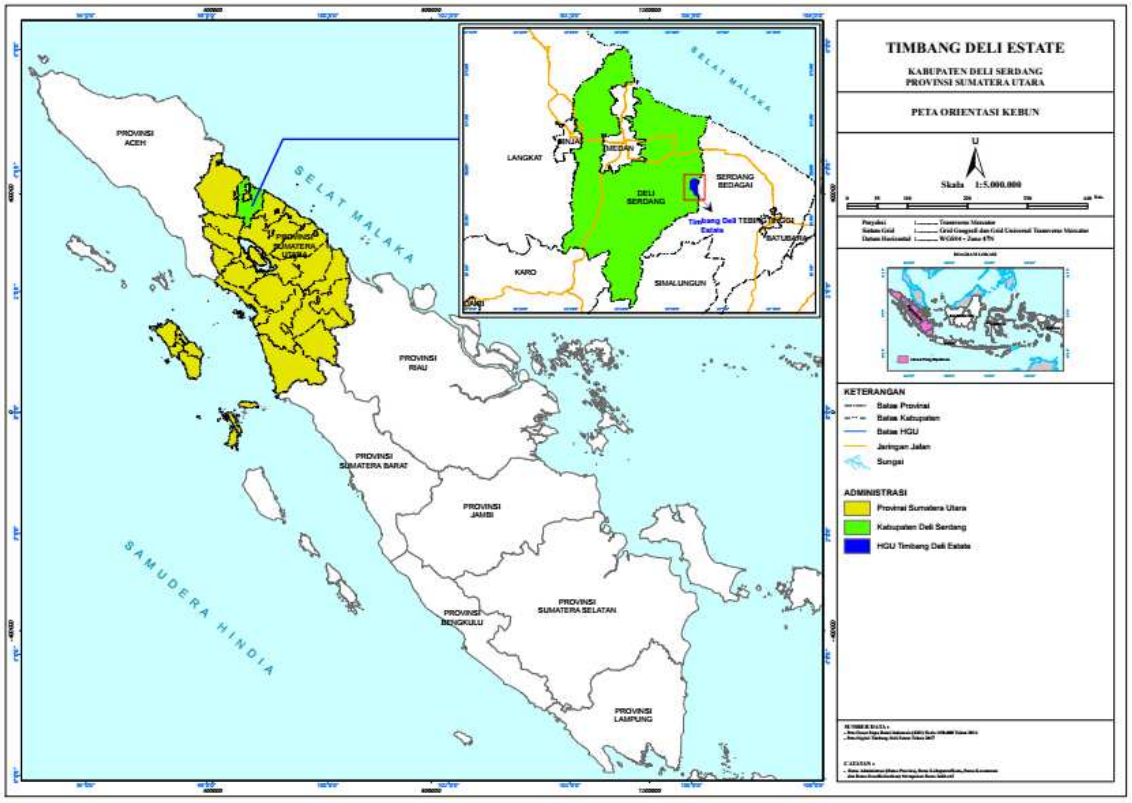

Figure 1. Location of PT Timbang Deli Indonesia

The main plant now is rubber that has been planted firstly in 1978 and has been replanted several times. There is now 588.66 Ha of rubbers and 70.61 Ha of oil palm. PT TDI will convert rubber into palm oil gradually and will be finished in 2030 (Table 1) and stage of conversion can be seen in Figure 2.

Tabel 1. Conversion plan in PT Timbang Deli Indonesia

Conversion to Oil Palm		Cumulative
Year	(ha)	(ha)
2017	20.35	90.96
2018	19.91	110.87
2019	49.86	160.73
2020	43.59	204.32
2021	60.36	264.68
2022	65.51	330.19
2023	47.33	377.52
2024	90.57	468.09
2025	87.13	555.22
2026	108.46	663.68
2027	63.12	726.80
2028	57.74	784.54
2029	107.13	891.67
2030	78.77	970.44

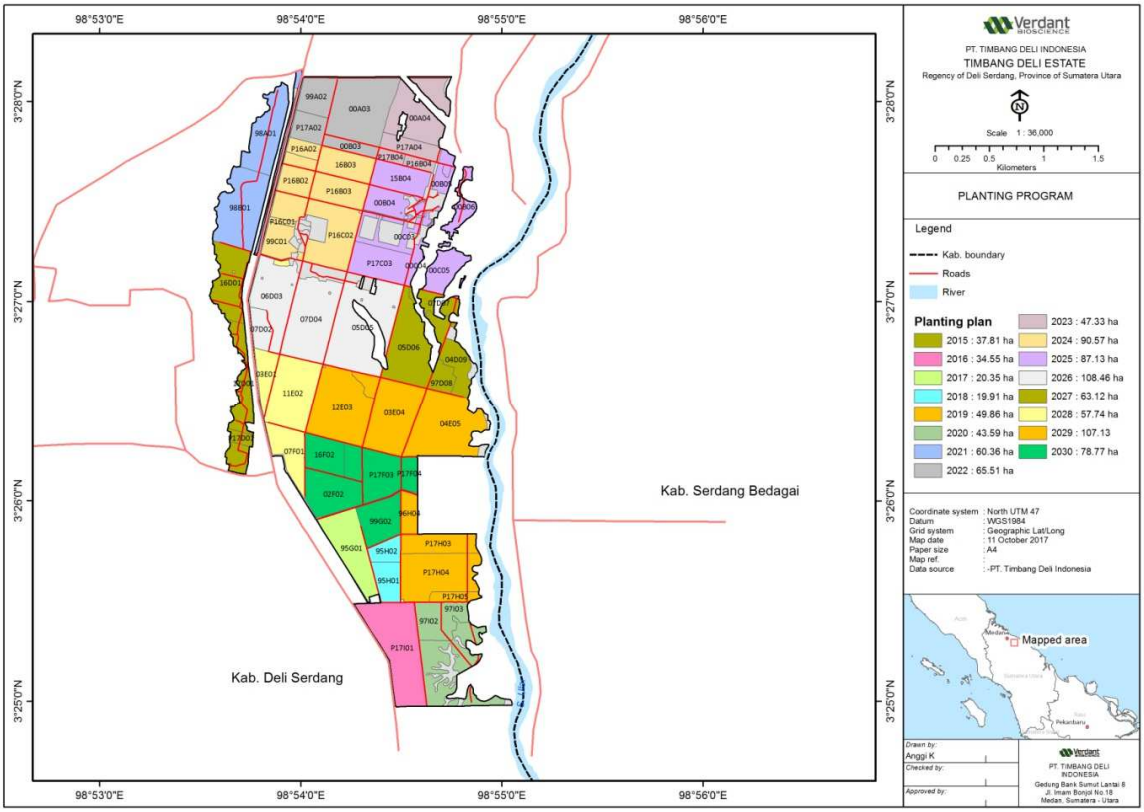

Figure 2. Stage of conversion plan in PT Timbang Deli Indonesia

Chapter 2

Assessment process and methods

2.1. Social Impact Assessment

Social Impact Assessment (SIA) was undertaken to identify social impacts and risks on the plantation operation including plan to convert rubber crops to oil palm in PT Timbang Deli Indonesia. Research location is in the Timbang Deli Indonesia estate and the areas that are estimated to receive the impact of the plantation operation coveriing Timbang Deli village, Jaharun A village, Keramat Gajah village and Galang Kota village. All the villages are under Galang sub-district authority within Deli Serdang District.

SIA is conducted within the framework of social sustainability approaches, plans for changing rubber crop to oil palm, and its operations are seen as influencing local people's lives and risks for the company. There are five components of the approach to the living assets (pentagon assets) of the community: 1) natural resources, 2) human resources, 3) financial resources, 4) social resources and 5) physical resources. The identification approhach in SIA is done by: 1) Participatory; active stakeholder involvement in the impact identification process; 2) Consultation: stakeholder representation actively involved in exploring aspirations or impact management ideas; 3) Triangulation: conducting field studies by combining observation, interview, verification, 4) Rapid techniques; done quickly to explore the issues and substances. Three data collection methods used in this SIA study are: First, guided interview and open interview (open interview). Second, direct interviews based on questionnaires on respondents aimed at finding people's perceptions of the Timbang Deli Indonesia plantations activities. The respondents were chosen purposively by taking into account the conditions required to meet the observations. Third, observation or observation, conducted on the pattern of daily life of the people around the garden and interact with the company.

The output (output) of this activity is used as material for preparing a social management and monitoring plan, which is an integral part of the overall management of sustainable palm oil production by PT Timbang Deli Indonesia. The SIA research was conducted within two months, with activities: preparation, field research, analysis and report writing that began in September 2017 - October 2017. Field activity for interview and observation carried out on 6-8 September 2017 and data verified on 2-3 October 2017.

Secondary data resulted from either field survey or desk study is an important part in measuring both positive and negative impacts to the community. Factors that can impact physical, biological, and socio-economic of environment are analyzed using those secondary data. Factors is assesed including the potential of micro climate change and pollution due to land clearing and rubber convertion, changes in river water quality and quantity, sedimentation resulted from the operation, chages in behaviour for the worker which used worked in rubber and wil transfer to oil palm culture, and socio economic demands from the community on the new cultivation system and the consequencies. The assessment was performed by one leader expert, namely Henry Marpaung (Provisional ALS160007HM) and assist by Ridho Anggara.

2.2. HCV Assessment

2.2.1. Method

HCVs identification use the Common Guidance for the Identification of HCV (Brown et al., 2013), HCV Assessment Manual (HCVRN, 2013), and Identification of High Valued Conservation Guidance in Indonesia (Consortium HCV Toolkit Revision Indonesia, 2008). A step-wise screening approach is used to align the required information according to the reference scale. The reference scale of HCV 1-3 identification includes global, regional and national level, and ground truthing verification. Identification of HCV 4-6 is done with emphasis on landscape or local level (Brown et.al., 2013), then ground verification. The implementation of HCV assessment includes i). pre-assessment, ii). field data collection, iii). stakeholder consultation, iv). analysis and mapping of HCVs until the preparation of reports.

i). Pre-assessment

The main activities at the pre-assessment stage include: (i) collecting data and information from the company on the development and management of the company, (ii) collecting secondary data and information from various sources (reports, journals, books, statistical data,), including from resource persons, on biodiversity aspects (global, regional and national, and local to the extent possible), environmental services (especially with regard to soil and water conservation) and socio-culture, and (iii) conduct analysis and validation collected data and spatial analysis of the base maps obtained. Previous HCV assessment reported on year 2014 is also studied as reference and initial base information.

ii). Data Collection

Data collection and field information focused on areas that were concluded as areas of HCV potential based on pre-assessment results. The density of data and information gathering is directed to the attributes or elements of HCVs by using a combination of several methods, namely:

- Mapping with the Management Unit (participatory approach) | is a preliminary activity when in the field to discuss pre-assessment results and focus on the target area of observation. This activity is integrated for all types of HCV (biodiversity, environmental services, socio-cultural).
- Participatory mapping with local communities (participatory mapping) | this activity is also done in an integrated manner for all types of HCV (biodiversity, environmental services, socio-cultural). The parties involved are the local community and the management who have knowledge and information about the areas within the identification and surrounding areas.
- Ground checking (ground truthing) | Direct field check to verify land use/land cover interpretated from satellite imagery. Each identification field checks in areas that are suspected to be areas that have HCV attributes or elements (potential HCV areas) for each of the identification areas, namely: HCV biodiversity (HCV 1-3), HCV environmental services (HCV 4), and social-cultural HCV (HCV 5-6).
- Field data collection | This activity is combined with ground truthing to verify and ensure the presence of HCV's attributes This activity is carried out using preliminary data and

information obtained from the pre-assessment process, which has been enriched with participatory mapping results and interview results. Activities are focused on areas considered to be HCV areas based on maps generated from previous work stages (potential HCV areas map), and other areas which considered important for examination. Flora fauna survey is conducted with determination of the sample in the area to be assessed. The stratified random sampling was applied by considering the habitat representation based on the current land cover. Data is collected by recording as many meetings of flora and fauna as possible on the paths observed by the observer. The conectivity between HCV 1, HCV 2, and HCV 3 is also considered. Identification of HCV 4 is conducted by desktop analysis on spasial plan, landscape, topography and river basins. A field verification is also applied followed by some interviews with the management staff and community respondens HCV 5 and HCV 6 are is carried out by rapid assessment with purposive sampling interview and direct observation in the field. Interview emphasized on FPIC (Free, Prior and Informed Consent) principle include: how important is the area of assessment for the community and the underlying reasons, how the history of natural resource use by the community, how the public opinion about land conditions in the area of identification with the utilization of the source of biodiversity.

- Consultation with the community (interview) | Information on the presence of attributes and elements of HCVs is also collected through interviews with selected resource person, i.e. community members or company employees and key figures who have much knowledge or experience with regard to the natural environment in the identification area. The presence information of attributes or elements of HCV includes current existence and historical existence. Verification or validation process is also done by comparing data and information from resource persons with data and information based on trusted references. To explore HCV 5-6, interviews focused on individual / family beneficiaries of land and resources within the company's area, both for basic needs and for religious-cultural purposes. This interview is also conducted on users of natural resources outside the identification area when it is detected that it has an area connectivity or is likely to be affected by the management activities of the farm.

iii). Stakeholder Consultation

This activity is conducted through face-to-face dialogue with representatives of key stakeholders, both from local communities, relevant local government institutions, and non-governmental organizations working around the identification area. The main objectives of stakeholder consultation are to: (i) deliver the process and interim findings of the HCV identification results in the field, (ii) obtain additional data and information and clarify the field findings, (iii) find out the current status or condition of HCV elements and pressure or threats to HCV areas, and (iv) receive attention, concerns and inputs for the preparation of reports and advice for the protection and management of HCVs.

iv). Data analysis and HCV mapping

Data collected from the field activities are compiled and tabulated for each area of confirmed

HCVs attributes/ elements found in the field. This process is followed by several analyzes to corroborate justification for the conclusion and determine the boundaries of the HCV areas. The boundaries of the area with similar field characteristics in the relevant location are further digitized on the work map. From this digitization process will be produced closed polygons. The boundaries of areas on the map represented by these closed polygons are expressed as indicative boundaries of the HCV area. It is said to be indicative because these limits are based on the results of the boundary search of the area on the map; no delineation has been conducted. Because the boundaries are indicative, the extent of these areas is indicative. The resulting map of this process is an indicative map of the HCV area.

2.2.2. Assesor team and Timeline

The assessment was performed by four experts, namely Henry Marpaung (ALS 160007HM), Wibowo A. Djatmiko, Riswan Zen, and Harry Kurniawan. List of assessor , role and expertise is shown on the Table 2.

Table 2. List of assessment team personnel and their credentials con HCV assessment of PT. Timbang Deli Indonesia

Nama	License ALS	Rolen	Expertise
HenryMarpaung h.marpaung1@yahoo.co.id	Provisional (ALS160007HM)	Team leader, economic, socio-culture field (HCV 5-6)	Community empowerment, conflict mitigation, participatory mapping, FPIC and CSR, identify HCVs and SIAs since 2010
Wibowo A.Djatmiko Bowie146@gmail.com	-	Member, biodiversity field (HCV 1, 2 and 3)	Wild life ecology, forest ecology in general. Identify HCVs since 2006..
Riswan Zen	-	Member, environment services field (HCV 4)	Hydrology, topographic measurement, natural resource management, soil science, and environmental services since 2008
Harry Kurniawan	-	Member, landscape analysis and GIS specialist	Mapping and satellite imagery analysis, field survey, and forestry since 2013

The identification of HCVs in PT Timbang Deli Indonesia's plantation area was conducted on 31 October -2 September 2017 for pre-assessment and date 6 - 8 September 2017 for field identification, including stakeholder consultation, and from 10 September to 20 October 2017 for data analysis and preparation of reports. Table 3 presents the timing of the implementation of HCV identification activities.

Table 3. Schedule for the implementation of HCV identification activities

Stage	Goals	Activities	Time
Pra-Ground activity			
Pre-assessment and preparation	• Review previous HCV reports • Identify potential and indication of the presence of HCV attributes or elements • Identify areas of potential HCV • Understand better the landscape context • Identify conservation issues and potential threats to HCVs • Establish methods, survey design, implementation team of identification, and timeliness of field activities	• Collect preliminary data and information from the company • Collect preliminary data and information from secondary sources (reports, journals, books, statistical data, basic maps) and resource persons • Data analysis and spatial analysis	31 October - 2 September 2017
Ground activity			
Opening meeting & mapping	• Present the purpose and objectives of HCV identification • Obtain additional data and information on the status of development and management of the garden • Establish working teams (HCV + counterpart identification team from the management unit) and agree on work schedules • Clarify potential HCV areas of pre-assessment results • Collect additional information data on the presence of HCV attributes or elements	To discuss the work plan with the company's management unit • Workshop with resource persons	6 September 2017
Field survey	• Verifyy the presence of HCV attributes or elements • Identify HCV areas and map the indicative boundaries of HCV areas • Identify threats and potential threats to HCVs	• Field checks on land cover • Field data collection • Interviews with workers • Interviews with leaders, village officials / communities	6 -8 September 2017
Basic Explanation on HCV and Stakholder consultation	• Convey the results of HCV identification to other parties (community, local government, NGO) • Collect additional data and clarify the presence of HCV attributes / elements and threats or potential threats to HCVs • Collect inputs for the formulation of recommendations and options for	• Building a management unit's understanding of HCV: background, purpose and objectives, concepts, types of HCVs, attributes or key elements, and identification methods • Convey the results of HCV identification to other parties	8 September 2017

Stage	Goals	Activities	Time
	HCV management and monitoring plans	(community, local government, NGO) • Collect additional data and clarifications on HCV attributes / elements and threats or potential threats to HCVs • Collect inputs to prepare recommendations and options for HCV management and storage plans Workshop with key stakeholders • • Focus Group Discussions (FGDs) with key parties • • Interviews with resource persons	
Closing meeting	• Disseminate the draft result of HCV identification to the management	• Presentation and discussion • Deliver the Inception report	8 September 2017
Post- Ground activity			
Analysis and Report	• Present the results of HCV identification in a format-based and systematic format that meets scientific, yet coherent and simple rules that are easily understood by the management unit as the primary user of the report	• Data analysis • Spasial analysis • Report writing	September – October 2017
Final Meeting	• Report the final draft and agree on HCV management measures as well as receive final input	• Expose final draft report • Discussion	2 November 2017

2.3. Soil and topography

Soil data was derived from semi detailed soil survey with 1:25000 scale carried out by JH Agriculture Service in 2008. Soil type is classified according to USDA soil type classification. While the topographic information was derived from analysis of the topographic map and field verification. A 1:50000 scale topograpic map provided by National Geo-Spatial Agency (BIG) and SRTM 30m data (USGS) were used for the topography analysis.

2.4. LUCCA

In conducting this LUCCA assessment for PT Timbang Deli Indonesia (TDI) concession in Deli Serdang District, North Sumatra Province, some remote sensing and GIS experts has been drawn to complete the assessment. The team members had collective expertise and experience in Remote sensing / GIS, mapping and field survey. Below are brief summaries of the team members' experience:

Table 4. List of the assessors and their qualification and role

Name	Role	Expertise
Riswan Zen	Coordinator and remote sensing analyst	Riswan has extensive experience in remore sensing using some RS software such as ERDAS and ENVI. He was worked for an NGO based in Medan for several years with a lot of works in land utilization mitigation, land monitoring and analysis based on satellite images. He also gave remote sensing lectures at the University of North Sumatra , and entrusted to be a team of experts for the spatial planning of North Sumatra Province and several districts
Harry Kurniawan	RS/ GIS and mapping	Harry's background is in management forest, especially in land analysis and remote sensing and Geographic Information System. He has several experience in spatial works and satellite imagery processing and GIS at least for 5 years. He also acted as independent consultant for regional planning in North Sumatra, Riau and West Sumatra, and HCV assessments.
Ridho Anggara	Forester, field survey and mapping	He has experience in Forest Inventory and Biometrics with competences in Forest Mensuration and Measurement, Botanical Survey and Species Identification,GIS, and has forestry background

Desk study of LUCCA is heavily relied on interpretation of satellite image to identify and categorize land cover. ArcGIS 10.2 and ENVI software has been used for the image analysis and mapping. The LUCCA study was conducted with satellite imagery data covering the following periods:

i. Prior to November 2005 (RSPO Principles & Criteria first applied)
ii. November 2007 (deadline for RSPO Principles & Criteria implementation trials)
iii. Prior to January 1, 2010 (introduction of RSPO New Planting Procedure)
iv. After May 2014 (after new planting procedure is enacted)

The satellite imagery data used in the LUCCA Review is presented in Table 5 as follows:

Table 5. Satellite images used

Period of LUCCA	Type of Imagery	Acquitition date	Id Row Data
Before November 2005	Landsat 5	17-Aug-04	LT05_L1TP_129058_20040817_ 20161130_01_T1
November 2005-November 2007	Landsat 5	22-May-07	LT05_L1TP_129058_20070522_ 20161115_01_T1
November 2007-December 2009	Landsat 5	07-Feb-10	LT05_L1TP_129058_20100207_ 20161016_01_T1
January 2010– May 2014	Landsat 8OLI Tirs	07-Apr-14	LC08_L1TP_129058_20140407_ 20170424_01_T1
Time when HCV assessment conducted	Landsat 8 OLI TIRS	06-Sep-17	LC08_L1TP_129058_20170906_ 20170917_01_T1

The stages and processes of land cover change and land use analysis (LUCCA) refer to the Remediation and Compensation Procedures issued by the RSPO with the following details:

- Stage 1: Procurement process, including the downloading of satellite image data with a minimum resolution of 30 meters.
- Stage 2: Pre-processing, including correction of atmospheric effects, geometric correction and operation of satellite image data processing from the period to be used.
- Stage 3: Interpretation, covering land cover interpretation process from preliminary satellite image data, with reference to vegetation coefficients specified in remediation and compensation procedures.
- Stage 4: Ground-truthing (field verification), including field verification activities with field evidence proof of initial satellite imagery results on land cover. On the basis of the land cover, sampling method, number sample points, and their distribution are determined. There were 40 sample points observed in the field and placement of the sample points follows the *stratified purposive sampling*.
- Stage 5: Image validation and reinterpretation, including the process of validating satellite imagery of previous interpretation results by making corrections that refer to field check results. Land covers based on satellite image analysis are validated using Kappa Accuracy and Overall Accuracy.
- Step 6: Create a map of the result of the change analysis, covering the process of making the land cover map layout that has been validated with the result of field check to be presented in the report.

2.5. HCSA (High Carbon Stock Assessment)

In order to optimise the use of human and financial resources, the carbon stock assessment of the PT Timbang Deli Indonesia concession was carried out at the same time with the HCV assessment. The process was led by an HCV Resource Network Licensed Assessor working with other discipline experts including GIS, Botanist/ecologist, Forester and other support staff.

2.5.1 Assessors and their credentials

In conducting this carbon stock assessment for PT Timbang Deli Indonesia (TDI) concession in Deli Serdang District, North Sumatra Province, Koompasia Institutw has drawn on its internal and external capacity that used worked for Koompasia Institute for HCV, and HCS assesment.. The team involved in the assessment are therefore highly competent in the field of natural resources management, botany, forest survey and data processing. The team members had collective expertise in Botany/Ecologist, Socio-Agriculture, Forestry, Environmental Science. Together, they possess several years of experience working on plant identification,tree measurement techniques, forest survey, carbon stock assessment,vegetation dynamic study, big data treatment and processing, ArcGIS and remote sensing. Below are brief summaries of the team members' experience:

Table 6. List of the assessors and their qualification and role

Name	Role	Expertise
Henry Marpaung (ALS160007HM)	Assessment oversight and community consultation)	Community empowerment, conflict mitigation, participatory mapping, FPIC and CSR. Has more than 10 years in socio –rural assessment and since 2010 involved in SIA, HCV assessment. Henry has also provided training and technical support to companies on palm oil certification for the RPSO and ISPO system, ISO and safety.
Riswan Zen	Assessment Coordination/ NRM expert and landuse planning	Riswan specializes in conservation and natural resources management, with over 8 years of extensive experience in forest management, environment services mainly in northern sumatra area. He also written an eviromental economic books of Leuser ecosystem services. Used to national park and protected forest , monitoring and evaluation. He has education background in NRM and foresty. He is also good knowledge in spatial modelling, and climate change scenarios in long-term ecosystem monitoring
Wibowo A.Djatmiko	Botanis/ecologist	Wild life ecology, forest ecology in general. Wibowo has some extensive dendrology works in identification vegetation and forest inventory. He has worked for HCVs identification since 2006 ad HCV since 2012.
Harry Kurniawan	GIS and mapping and Landscape analyst	Harry's background is in management forest, especially in land analysis and remote sensing. He has several experience in spatial works and satellite imagery process at least 5 years. He also acted as independent consultant for regional planning in North Sumatra, Riau and West Sumatra, and HCV assessments.
Ridho Anggara	Forester, flora survey	He has experience in Forest Inventory and Biometrics with competences in Forest

		Mensuration and Measurement, Botanical Survey and Species Identification,GIS, and has forestry background
Danny Joshua	Forester, flora survey	He has experience in Land assesment and Forest Inventory Botanical Survey and Species Identification,GIS, and has forestry background

2.5.2 Methodology and procedure used

Desk-based literature review

A desk review of documents including paper and cadastral maps provided by PT. TDI was carried out prior to the field assessment. The objective of the desk review was to identify the key landscape level concerns that are relevant for the assessment area and to also have a better understanding of the geo-physical characteristics of the landscape.

Planimetrics and land cover classification

For the first step in planning for the assessment, a combination of satellite images of the wider landscape was used. This included publicly available Google Earth imagery which were used in the initial planning for the assessment. Satellite imageries were thereafter used to aid the assessment of the study area and to determine the land cover classes in the area. The satellite imageries were studied closely in order for the team to get a clearer picture of the nature of the vegetation cover, and to help inform sampling design.

The next step is to identify forest area that can still be preserved or return to its eco-logical function as a forest. In this step, the process began with mapping local communities' land by their participation so that areas being used by local communities are properly identified. The third step is to acquire consent and support from the local and traditional communities in attempt to preserve, manage, and protect the relevant forest. The fourth step is to calculate the carbon stock in the area of study.

As mentioned above, community involving is also been taken in frame of FPIC approach to ensure which potential impact could be arised during the plantation operation, to recognize the key stakeholder in the area that could be supporter or inhibitor. FPIC is the right of the community to obtain clear and informed information prior to a development investment activity carried out in their region, and on the basis of the information obtained they freely express without consent or refusee.

Study area of the HCS assesmet is the whole area of PT Timbang Deli Indonesia concession in Galang sub-district, Deli Serdang District with total area of 972.19 Ha. The carbon savings value information was obtained from land cover analysis through satellite image analysis and field survey (ton C / ha). Satellite image Landsat 8 acquired in 6 September 2017 is used to determinate the land cover type.

Sampling and experimental design

Land cover classification is carried out by hybrid interpretation, the classification is done

based on supervised classification and corrected by manual interpretation. Software used for guided interpretation is ENVI 5.1 using the maximum likelihood method. As for visual interpretation used ArcGIS software 10.3. Visual / manual interpretation is used to correct the initial interpretation results based on field survey results. The number of sample plots in the field is done by stratified sampling with random start method obtained from the vegetation class stratification in the assessment area. The number of sampling plots distributed proportionally based on the land cover area on each type of vegetation class by prioritizing the representation of data in each vegetation class. Overall, the number of sample points taken in this study was 41 points. The plot used in the HCS study is a 10 m x 50 m (0.05 ha) rectangular plot in which there is a large plot of 10 m x 50 m and a small plot of 10 m x 10 m. The forest inventory study was conducted by transect method placed 6 to 8 plots adjusted to the boundaries of the study area and field conditions.

Data analysis

Aboveground biomass was estimated using allometric equations to estimate the biomass value of each type of vegetation. Each type will use one separate allometric formula. However, if there is no possible or unfounded allometric equation for a particular type, then the allometric equation formula used is the general formula for all multi-stemmed trees issued by Katterings et al. (2001), as follows:

$$\mathbf{B\ (Ton) = 0{,}11 * \rho * (DBH)^{2{,}62}}$$

B = biomass; ρ = wood density ; DBH = diameter at breast height

The underground or belowground biomass (BGB) was deduced using the assumption that, for each individual tree, the below ground biomass represents 20.5% of the aboveground biomass (Mokany *et al*., 2006). Therefore, the total biomass was equal to 1.205 * B. To deduce carbon content from the biomass, the carbon stock is calculated based on the equation issued by IPCC (2006) as follows:

$$\mathbf{C\ (ton\ C) = 0.47 *\ 1.205 * Biomass}$$

In case of rubber trees, biomass fraction used is 0.4 with reference to the Guidelines for the Use of Alometric Models for EstimationBiomass and Indonesia Forest Carbon Stock (Regulation of the Head of the Forestry Research and Development No.P.01 / VIII-P3KR / 2012). Wood density on tropical forest tree species was compiled from ICRAF South East Asia: http://www.worldagroforestry.org/sea an in appendix Chapter 4 of the IPCC Guidelines (IPCC, 2006).

Of the 28 trees species recorded in the inventory of the concession, wood density was availablefor 24 species. For the remaining species not reported in these databases, we used the mean wood density of the matching genus (4 species).

Chapter 3

Summary of findings

3.1 SIA

The general livelihoods of the villagers around the company of PT Timbang Deli Indonesia are farmer with prime commodities cultivated are rubber, oil palm and seasonal mix food crops. The social environment in the surrounding villages of PT Timbang Deli Indonesia is relatively conducive, there is no negative social issue in the relationship between the company and the villages.

PT. Timbang Deli Indonesia will convert rubber gradually until year 2030 which intended to avoid the extrim change in micro climate and work culture for workers who mostly come from the surrounding villages. There is no serious environmental impact that will be produced from the conversion from the rubber plantation to oil palm plantation. Some issues of the impacts that may occur rised by the community include:

1. Physical components. The impacts are mainly resulted from micro climate changes. The people are worried that the natural environment around their village will become hot, and otherwise there is concern on water shortage when oil palm becomes the main crops.. Negative impact mitigation from conversion activities to physical component are focused on climate change and water conservation. However PT. Timbang Deli Indonesia has years of experience and the proper SOP on conserving water. On concerns about the changing weather that will heat up, PT Timbang Deli Indonesia will not replace rubber at once but gradually until 2030 to provide better adaptation. In addition, tree trees will continue to be planted along roads, housing and offices as well as on river banks.

2. Biological components. The existing rubber plantation has been habitat for certain wildlife. Eliminating the rubber plantation will eliminate habitat of the wildlife and that in turn the wildlife itself. However, there is no critically important species involved (rare, threatened, endangered).

3. Socio-economic components. The main economic activity of the local communities is being a farmer. They work as an employee of PT. TDI in rubber plantations for additional income. Another impact that people is concerned about is the change in the different working systems between rubber and oil palm. As employee, they and their family live within the company's rubber plantation. PT. TDI plans to involve the local community more in the conversion activities either by employing them or hire them as a contractor to reduce any negative perceptions.

Timbang Deli Indonesia is a plantation which has long been established and side by side with the community built the region surround the Timbang Deli village region. The company maintains good relationships and communications with stakeholders. The boundaries of land as the most risky aspect of conflict in the community have been well managed by making ditches, walls or maintenance of the boundary.

In accordance with the studies show that Timbang Deli Indonesia has a positive impact such as:

1. Encouraging the development of socio-economic life of the Deli Serdang District and Galang Sub-district;
2. There is an opportunity to work on local entrepreneurs with the opportunity of partners or partners for the company;
3. Regularly the company undertakes a social responsibility program with Corporate Social Responsibility (CSR) program. The realization is in the form of scholarships, improvements to houses of worship, repair of village roads, and bridges, and transport for emergency matters.

3.2. HCV assessment

On May 22, 2014, an HCV assessment was previously conducted in the PT TDI concession conducted by a consultant of Faculty of Forestry, IPB. Under the terms of the new RSPO plantation procedure (NPP) of 2015 it was stated that in case of HCV assessment report is more than three years old at the time of NPP, the report should be reviewed returned and updated by ALS licensed assessor. This new HCV assessment is emphasized on the updates the previous HCV report.

Actually almost of the concession of PT TDI is already planted mostly with rubber for decades. However there is some importan small streams to provide water and at the east side bordered with Sungai Ular river. Land use over the PT TDI concession is dominated by 588.66 Ha of rubber crops (60.55%); 193.49 Ha (19.90%) bare land (replanting area); 70.61 Ha (7.26%) and shrubs/groves of 72.32 Ha (7.44%). Figure 3 shows land use in and around PT Timbang Deli Indonesia

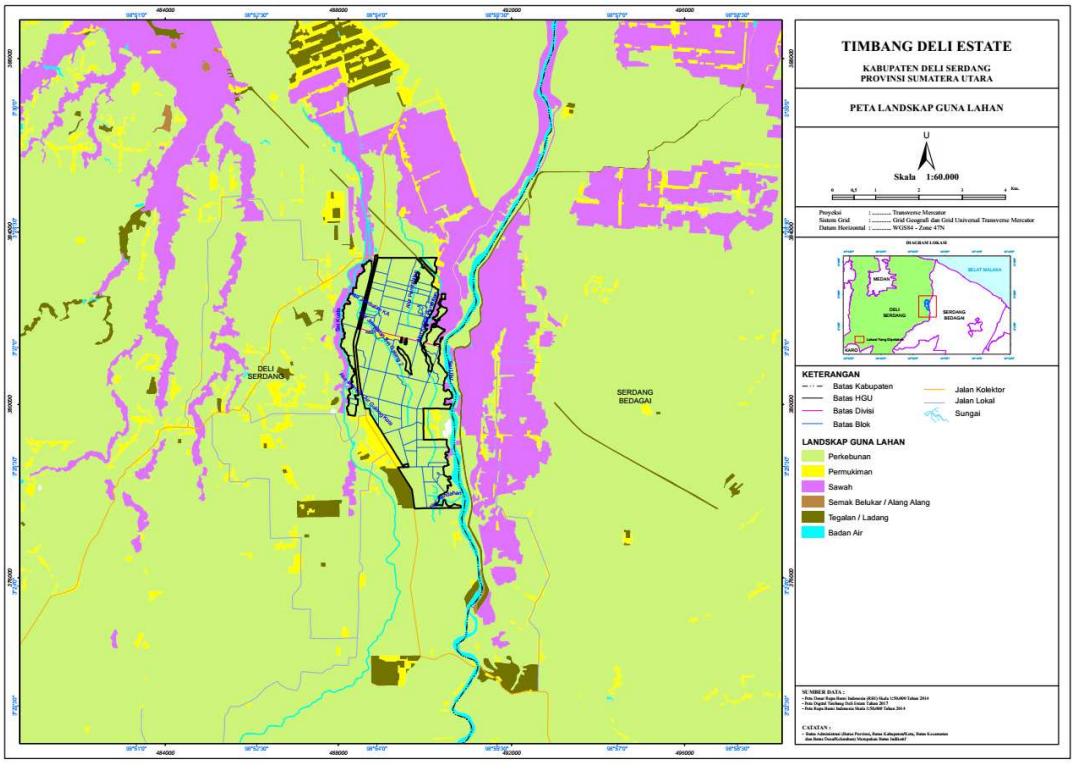

Figure 3. Land use /land cover wtihin the PT TDI's concession and surrounding area

3.2.1. HCV Findings

The results of field data collection and analysis of all data indicate that area within PT TDI concession has 3 HCV categories, namely HCV 1, HCV 4 and HCV 6. Summary of HCVs present in PT Timbang Deli Indonesia consession is presented in Table 7.

Table 7. Summary of HCV presence/absence in PT TDI's concession

HCV	Definition	Summary and Justification		
		Presence	Potency	Absence
1	Biodiversity concentrations include endemic species, and endangered, threatened or critical species (RTE), which are significant at the global, regional or national level	It is found wetland areas where there are several important species for conservation such as eagles, monitor lizards, and several other bird species.		
2	Mosaic ecosystems and major landscape-level ecosystems at a global, regional or national level, and contain the majority of the naturally occurring species populations that can survive in natural distribution patterns and abundances			The area is not a forest or mosaic of a natural ecosystem, covering a wide landscape; but rather rubber and oil palm plantations, with a few shrubs and surrounding rice fields.
3	Ecosystems, habitats or refugia are rare, threatened, or precarious			Both within in the concession and around is dominated by cultivation mosaic, no critical ecosystem is found.
4	Basic ecosystem services under critical conditions, including water catchment protection and erosion control on vulnerable soils and slopes	Some functional small streams found in the area to provide water or important for hydrology system. It is also a small swampy creek area for water keeping and reservoir.		

5	Places and resources that are fundamental to meeting the basic needs of local people or indigenous peoples (eg for livelihoods, health, nutrition, water), identified through engagement with affected populations or indigenous peoples			The assessment area is developed area and near urban area, there is no area can provide basic and irreplaceable needs for residents around the plantation
6	Places, resources, habitats and landscapes with significant cultural, archeological, or historical significance globally or nationally, or cultural, economic or religious values that are essential to local or indigenous peoples	There are several sites that have archeological / historical and religious values that are an important part of the community / population		

The HCV assessment report has been peer reviewed by ALS HCV assessor namely Mr. DR. Kunkun J. Gumara (kunjgurmaya@yahoo.co.id) on 5th November 2017.

The significance of the study area with HCV is unlikely to be at the national level. However, it is clear, at the local and plantation area levels, that the region is capable of supporting a relatively high diversity of animals, which is important for the conservation of wildlife and other biodiversity at the local level. The diversity of animals inhabiting this area is likely to be much more recorded if animal observations can be made at appropriate times, i.e. morning and evening until evening. The diversity of wildlife in the inland part of the concession is low, although as a whole it is recorded as 3 species of mammals, 50 species of birds, 9 species of reptiles, and 4 species of frogs.

The area that is also rich in wildlife is a low-lying area, the network of natural plots of trenches and creeks, with few swamps, forming a wetland area. This area is planted with oil palm as a protector and allowed to grow into a forest scrubland, which is in the southern area of HGU PT TDI. This lowly area is connected directly to the flow of the Ular River through a plot of residents' crops. There are several species of animals found in the lowland area and protected by national law and also classified in Appendix II CITES. Among these are: black eagle /brahmini kites (Haliartus indus), black-winged kite (*Elanus caeruleus*), crested serpent-eagle (*Spilornis bido*), collared kingfisher (*Todirhamphus*), long-tailed parakeet (*Psittacula*), cattle egret (*Egretta*), brown throated sunbrid (*Anthreptes* and *Cinnyris*), common water lizard (*Varanus*), as well as the Sumatran spotting cobra (*Naja*). Also recorded from this region is a type of squirrel (*Tupaia*) that has been rarely encountered locally, some types of reptiles and frogs. The bushland forest of this area is composed of the types of *Mallotus, Macaranga, Ficus, Microcos*, wild bananas (*Musa*), *Melastoma, Dicranopteris* and other. While the plants, among them, Lasia, water calladium (*Typhonium*), swamp grass (*Cyperus*), and fern (*Salvinia*). Since this lowland area has function for keeping out and entering the water from and to Ular river, it is considering the area can provide water and can be reservoir area. Therefor this area is considered as shared area of HCV 1 and HCV 4 with area of 1.97 Ha.

There is also found some small streams /groove in the concession which are important for maintain

the hydrological system in the area. This river channel is quite small as wide as 1 to 2 meters, but it becomes the upstream area that is able to streamline water into a larger river and keep water saturation to avoid surface run-off and flood. In addition to the small streams, it also some small area in the east side bordered with Ular river which is known as important and main river in the Ular watershed system. Total HCV 4 area 11.08 Ha (including swampy creek area of 1.97 Ha).

There are four sites that have archeological / historical and religious values that are an important part of the local community / population. The sacred tombs and common graves of ancestors routinely visited as part of religious rituals can be considered as HCV 6 with total of 0.872 Ha.

Distribution of HCV presence in the PT TDI's concession is presented in Table 8 and Figure 4

Table 8. Synthesa of HCV findings in Timbang Deli Indonesia concession

Type of HCV	Name	Area (Ha)
HCV 1 & HCV 4	Lowland swampy area	1.972
HCV 4	Riparian on stream of Buangan Air Galang Kota	0.910
	Riparian on stream of Jembatan KA	0.517
	Riparian on stream of Jembatan Sei Galang 2	3.819
	Riparian on stream of Kantor Penelitian	1.535
	Riparian on stream of Pembibitan	1.357
	Riparian on stream of Rendahan	0.123
	Riparian on Ular river	0.850
HCV 6	The Old Ducth graves	0.002
	The old China grave	0.003
	Sampun sacred tomb	0.002
	The muslim cemetery	0.865
Grand Total		**11.955**

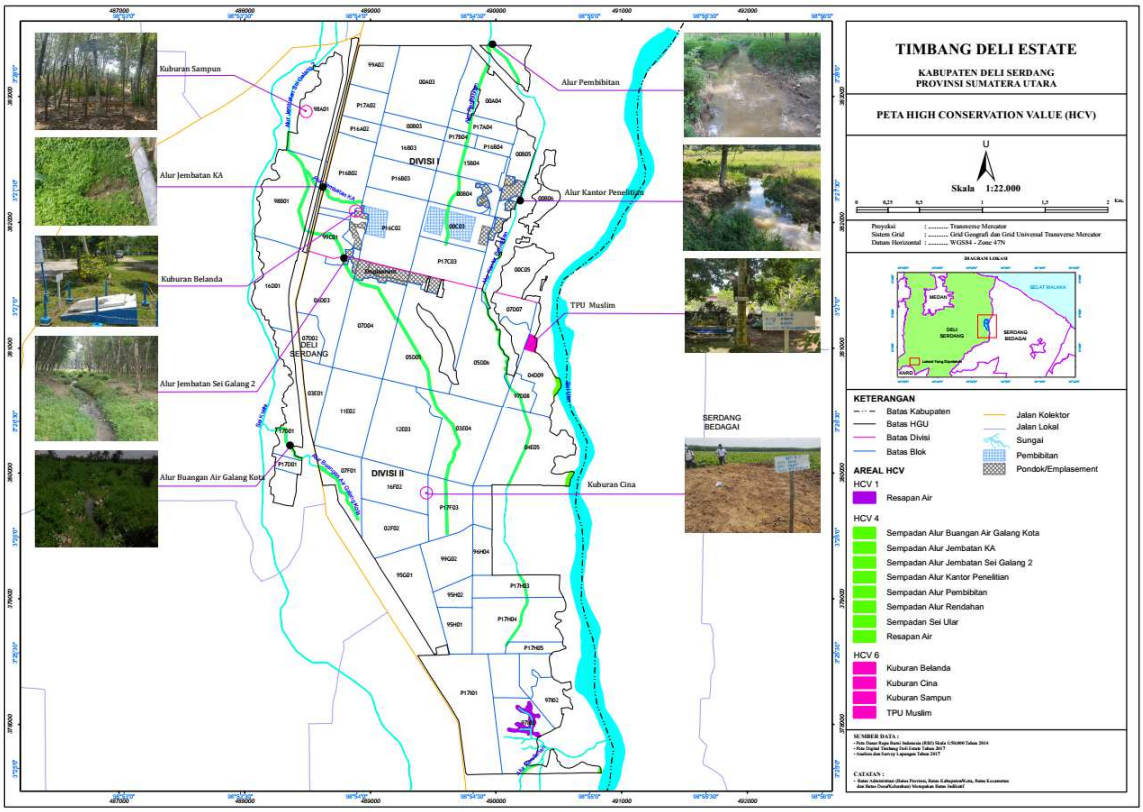

Figure 4. Distribution of HCV areas in PT Timbang Deli Indonesia

3.2.2. Stakeholder consultation

Consultation is implemented by direct interviewing during field activity and long distance consultation using electronic mail (e-mail). Stakeholders were categorized into groups based on relation and interest to the assessed area and object being assessed. There are 3 groups of stakeholders that have been used to categorize interviewed individual stakeholder. Those groups are local communities, management unit, and local goverment.

Local communities were interviewed during field survey represented by village administrators (local people and worker, village bodies, and community leader). The company management unit, such as estate manager, sustainability staffs and Director were also interviewed, and tha last part is local goverment represented by head of sub-district, and village head or village secretary. Consultantion is carried out through interview, presentation and pre-assessment analysis, non-formal meeting, and discussion during public consultation held on 8 September 2017.

Based on public consultation, especially with local communities surrounding the assessed area, all communities interviewed have no critical objections on land opening for rubber conversion into palm. As described at SIA section, community's concerns is situated on micro weather change, water reserve, and the change in the different working systems between rubber and oil palm.

3.2.3. HCV management are*as*

The TDI's concession is a part of commercial agriculture for decades. The surround area has been intensively exploited for rubber plantation, palm plantation, settelements, and infrastructure development. At national scale and landscape, it is very unlikely to find HCV area within the assessed area. The assessed area is located and surrounded by agricultural mosaic, however some HCV areas are found in the concession with total area of 11.95 Ha consist of HCV 1, HCV 4 and HCV 6. Thus, these HCV areas must be managed properly to maintain or enhance its function.

The results of the threat assessment show that in general the areas of HCV face a relatively moderat threat. This is because access to the study location is relatively easy. The potential threat to HCV 1 elements is the loss of habitat of some national protectes species or classified in Appendix II CITES such as black eagle /brahmini kites (*Haliartus indus*), black-winged kite (*Elanus caeruleus*), crested serpent-eagle (*Spilornis bido*), long-tailed parakeet (*Psittacula*), cattle egret (*Egretta*), brown throated sunbrid (*Anthrepte*s and *Cinnyris*), common water lizard (*Varanus*), as well as the Sumatran spotting cobra (*Naja*). Birds is always need trees as their living habitat, rubber can be useful as a place of settling, nesting, and so on. Gradually conversion allows them to still find a place to live. The presence of old shrubs in swampy lowland areas can be a wildlife refugia area as weel as the riparian zone.

The threat to HCV 4 is also generally quite high, especially with regard to land conversion in river borders mainly in Ular river. This will have an impact on the decline in river border function as a filter of soil erosion or residue from the application of agrochemical materials. In addition, it will also reduce the stability of river cliffs so vulnerable to morphoerosi. Inadequate HCV field boundaries may also decrease the function of HCV areas due to the reduction of HCV area area. The riparian boundary to be managed is set 30 meters wide from the banks of the Ular river. Especially on small streams which are also identified as HCV 4 areas, since they are so small and and have more functions as a channel to drains water, there is no need to establish a permanent non free palm oil area. Areas management is more emphasize on how to keep the water quality and water flow can be maintained to keep water saturated conditions and avoid flooding. A best practise agriculture must be applied on the riparian zones as wide as 5 meters with manual maintenance instead of chemical application.

3.3 Soil and topography

Refer to "Semi Detailed Soil Map" by JH Agriculture Service, the soil type in the concession of PT Timbang Deli Indonesia is mostly covered by:

- Endoaquepts and Kandiudalfs / local name "Keladang" (association of Inceptisol and Alfisol). Endoaquepts and Kandiudalfs are soils that can have an octal horizon and albic epipedon such as entisol soils that also have some other distinctive features This is immature soils which has a weak profile development compared to adult soil and still

resemble the nature of the parent material, have rough texture with 60% sand content, having only a horizon that contains a lot of sour sulfate (catday), and rusted.

- Kandiudults (Ultisols); local name “Sorek”. : Kandiudults has a very wide distribution, covering almost 25% of the total territory of Indonesia. Deep soil and moderate to high cation exchange capacity make this land an important role in the development of agriculture in Indonesia. Almost all types of plants can grow and thrive on this land, unless limited by climate and relief. The natural fertility of Ultisol soils (Kandiudults) is usually found on thin horizons with low organic matter content. Macro nutrients such as phosphorus and potassium are often deficient, highly acidic to highly acidic soil reactions, and high aluminum saturation is an Ultisol soil property (Kandiudults) that often inhibits plant growth. In addition there is an argillic horizon that affects the physical properties of the soil, such as reducing micro and macro pores and increasing the flow of the surface which can ultimately lead to soil erosion. The utilization of Ultisol (Kandiudults) land for plantation development is relatively unlikely to face constraints, but for food crops, it is generally constrained by these chemical properties that farmers find difficult to handle.
- Endoaquaepts (Tolan / Kesuma series): sub-soil gray-brown soil to light gray and patterned, fine sandy clay to clay, 35-60% clay and have a thinner to slightly deep soil layer with effective soil depth 50 - 100 cm , has rather ugly drainage, high groundwater levels and short flooding during the rainy season.

Map od soil type in PT Timbang Deli Indonesia concession is shown in Figure 5.

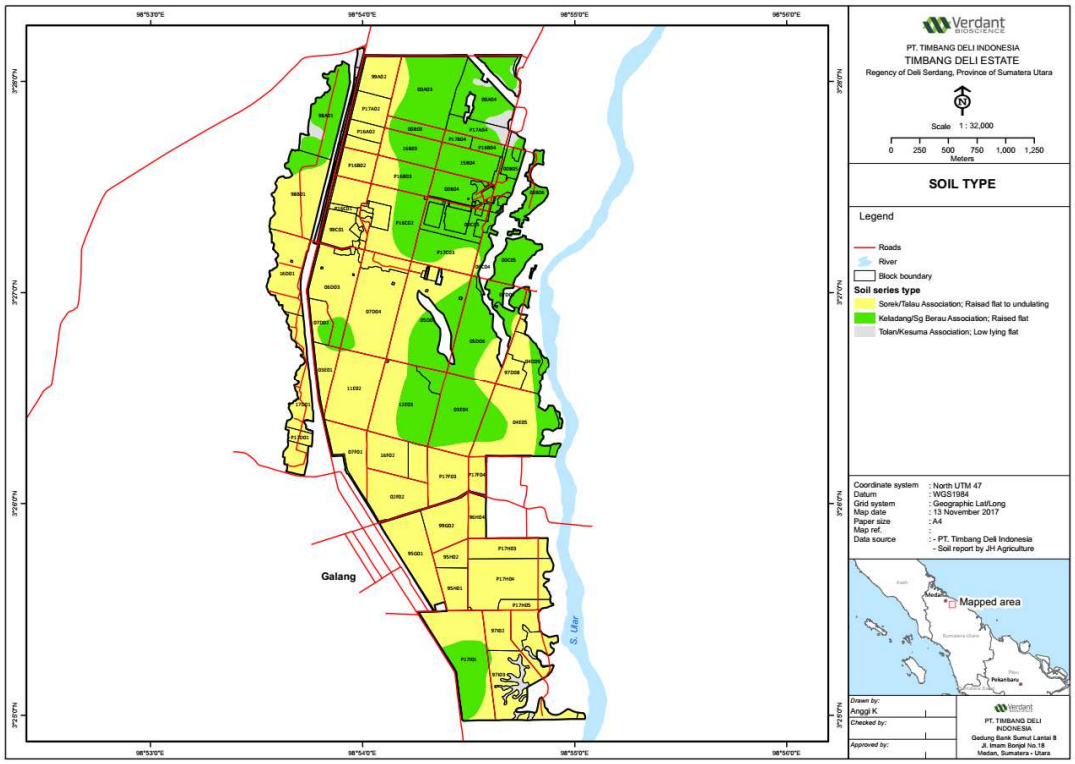

Figure 5. Soil type distribution in PT Timbang Deli Indonesia

The entire area of PT TDI is flat with a slope mostly less than 8% as a part of dry low land ecosystem (Figure 6). Soil erosion risk should not be a significant threat.

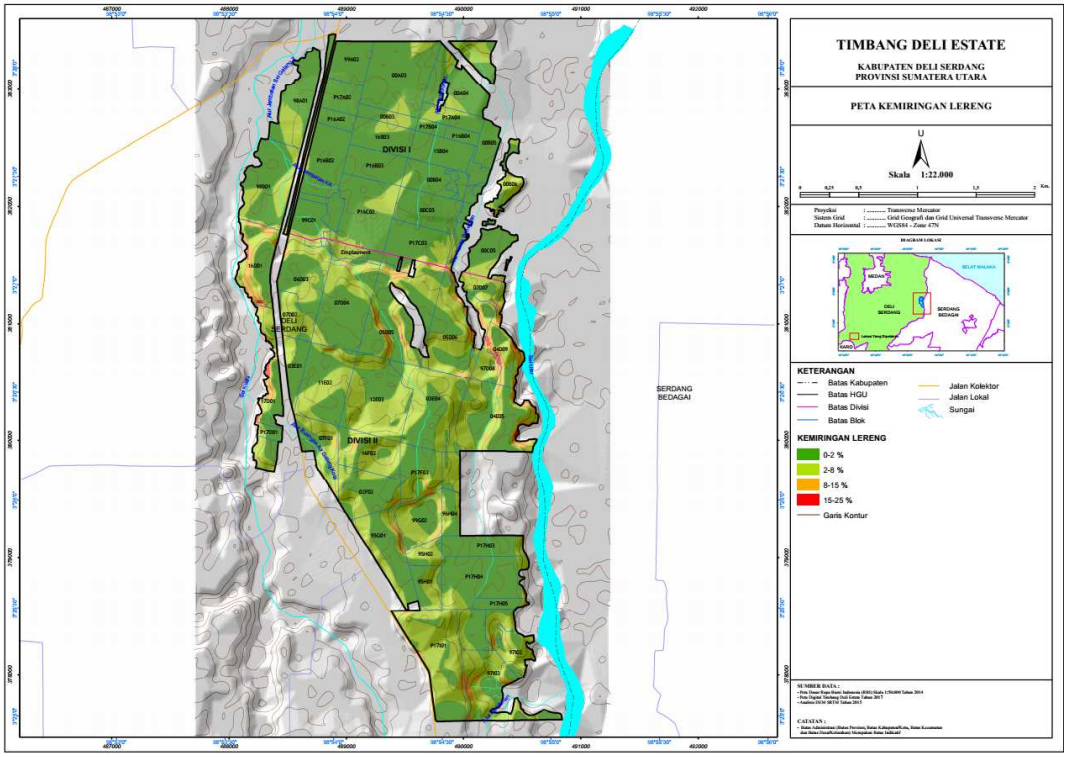

Figure 6. Slope /topographical condition in PT Timbang Deli Indonesia

3.4 LUCC Analysis

The size of area planned to be converted from rubber plantation into palm plantation is 972.19 ha (size is based on HGU license). Table 8 shows the changes in land use /land covers since November 1, 2005.

Table 9. Result of Land Use/ Land Cover Analysis of PT Timbang Deli Indonesia in 2007, 2009/2010, 2014 and 2016

Land Use/Land cover	2004		2007		2010		2014		2017	
	(Ha)	(%)	(Ha)	(%)	(Ha)	(%)	(Ha)	(%)	(Ha)	(%)
Rubber crops	873.11	89.81	873.11	89.81	873.11	89.81	821.18	84.47	588.66	60.55
Nursery	1.70	0.17	1.70	0.17	1.70	0.17	1.70	0.17	10.37	1.07
Emplacement	10.25	1.05	10.25	1.05	10.25	1.05	10.25	1.05	16.34	1.68
Arboretum	1.55	0.16	1.55	0.16	1.55	0.16	1.55	0.16	1.55	0.16
Public cemetery	0.87	0.09	0.87	0.09	0.87	0.09	0.87	0.09	0.87	0.09
Shrubs/bushes	66.73	6.86	66.73	6.86	66.73	6.86	66.90	6.88	72.32	7.44
Roads	17.99	1.85	17.99	1.85	17.99	1.85	17.99	1.85	17.99	1.85
Bare land							51.75	5.32	193.49	19.90
Oil palm crops									70.61	7.26
Grand Total	**972.19**	**100.00**	**972.19**	**100.00**	**972.19**	**100.00**	**972.19**	**100.00**	**972.19**	**100.00**

Source : by satellite image interpretation and field checking (2017)

Since year 2004, almost the entire of area is already been planted with rubber, while oil palm was just coming in year 2015. There is no significant change in land use and relatively constant. The bare land is coming from land preparation as result of rubber clearing. Based on the land cover situation, it can be concude all the types of land use /land cover has zero coeffisien in compensation procedure. There is no HCV area is cleared for crops plants, some areas are allowed to grow in form shrubs. Based on interview with the local inhabitants, it is also cleary explained that the study area is opened since decades ago, even in Dutch colonial era. It can be conclude no compensation or remmedition liability could be applied in the PT Timbang Deli Indonesia concession.

Historical land use change between 2004 and 2014 is presented in series of picture below.

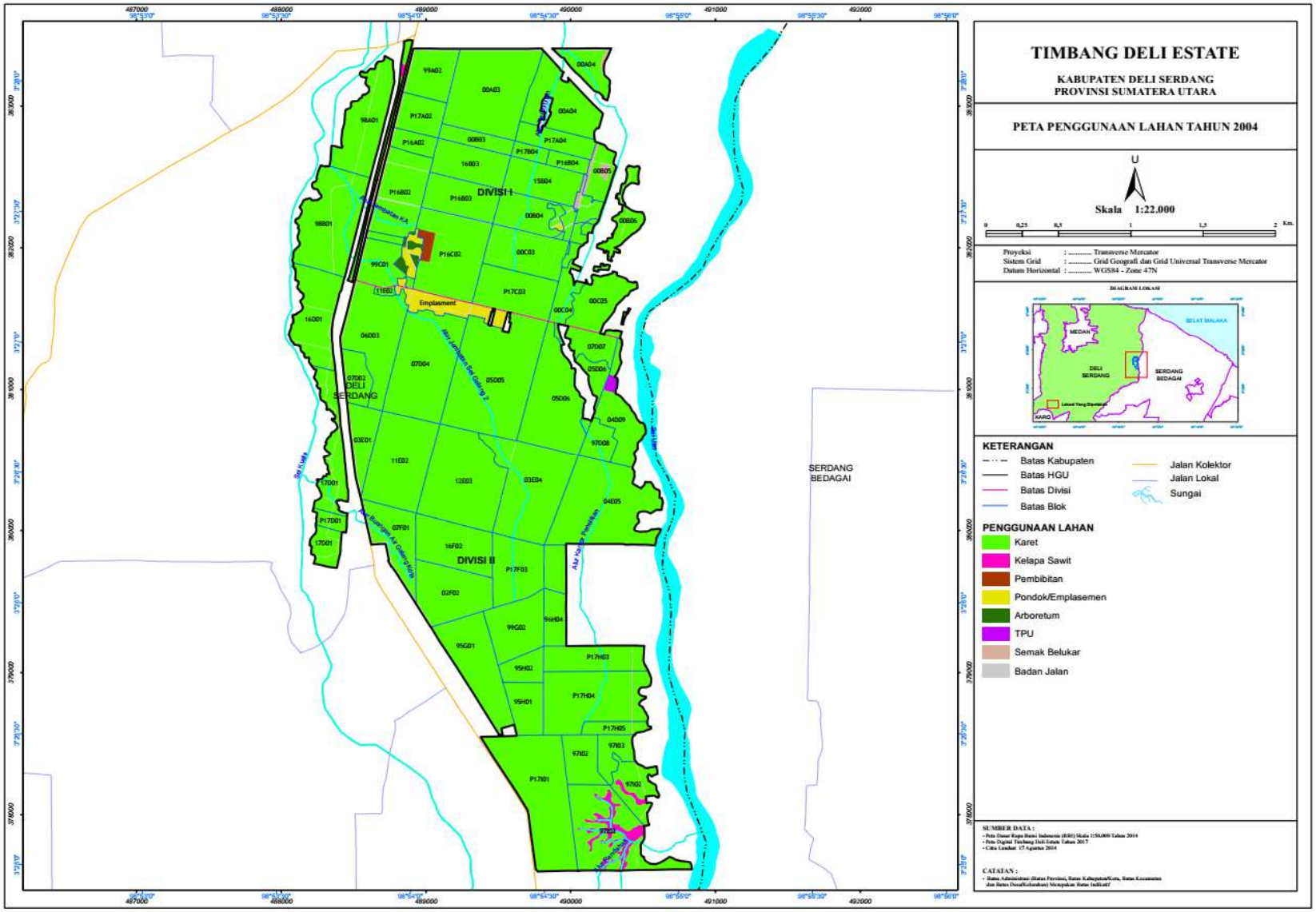

Figure 7. Land use in year 2004 in PT Timbang Deli Indonesia

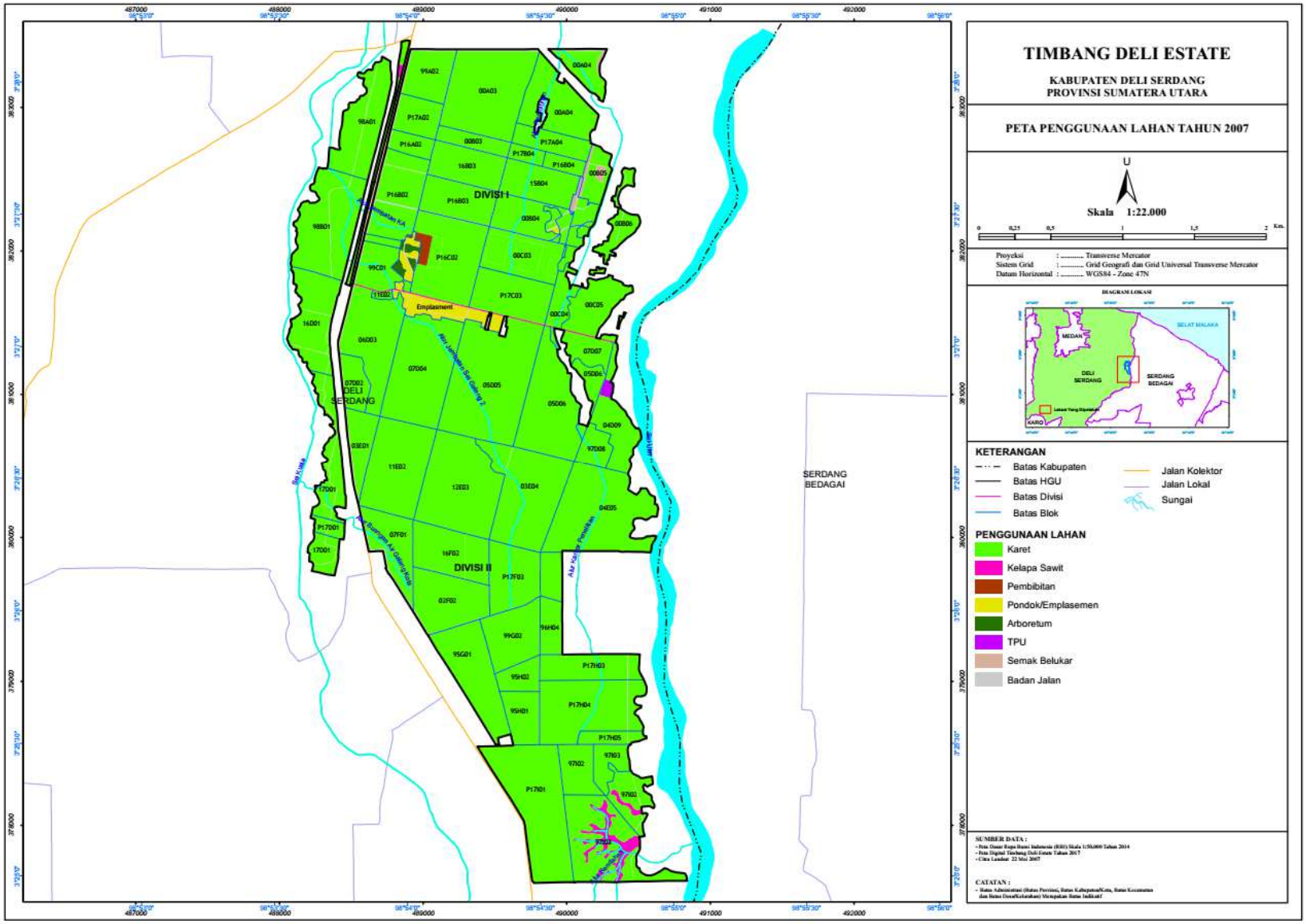

Figure 8. Land use in year 2007 in PT Timbang Deli Indonesia

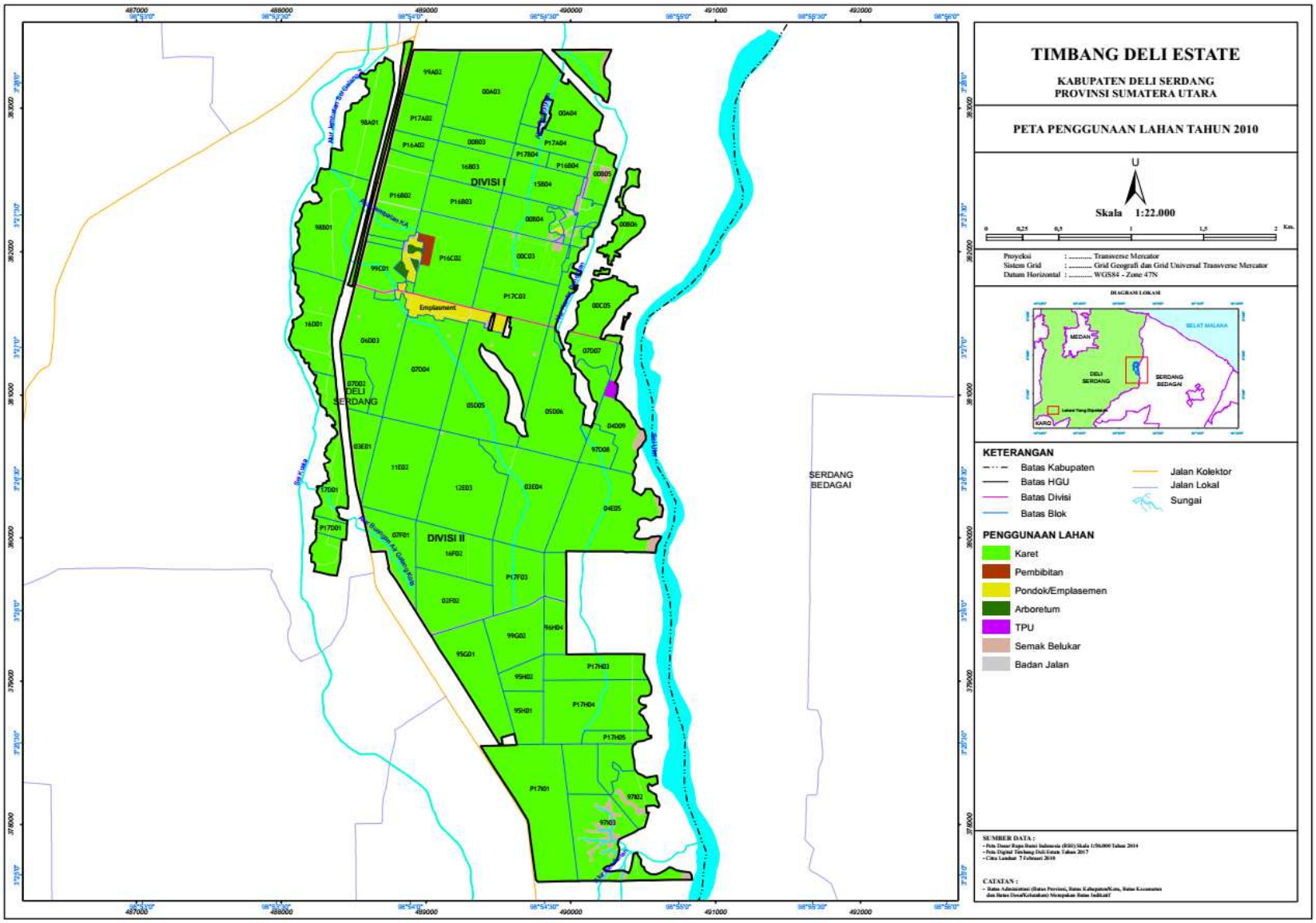

Figure 9. Land use in year 2010 in PT Timbang Deli Indonesia

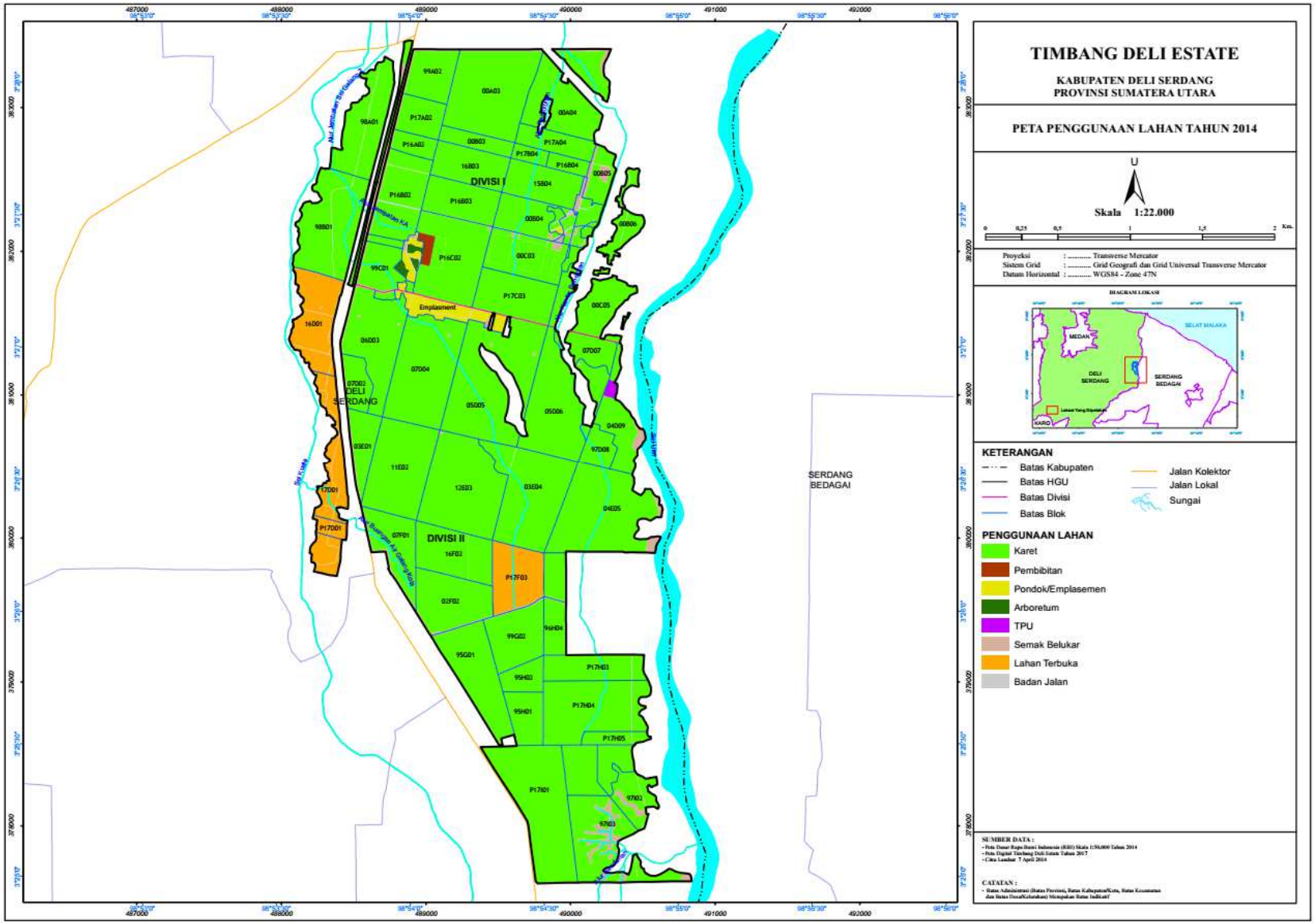

Figure 10. Land use in year 2014 in PT Timbang Deli Indonesia

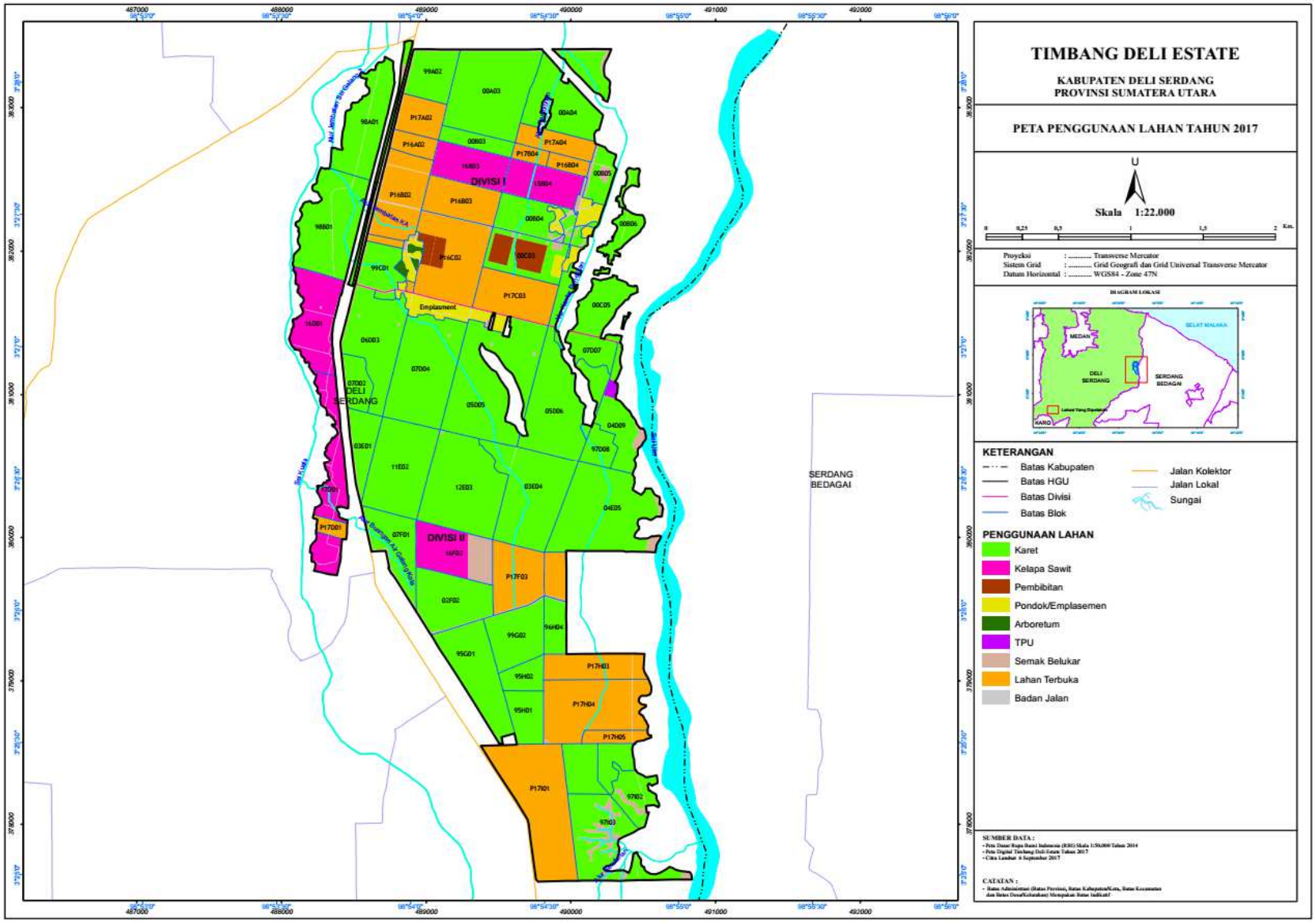

Figure 11. Land use in year 2014 in PT Timbang Deli Indonesia

3.5 HCS Assessment

3.5.1. Carbon stock

Land use of the concession is dominated by rubber crops(60.55%) and 19.90 % is already prepared for palm oil i form of open land (see the LUCCA analysis above). According to Forest Designation code of North Sumatra issued by Forestry and Environment Ministry No 579 year 2014, the concession and its surrounding is in Other Utiization Allocation Land (APL), there is no forest designation in the region, the most closest protected forest lain on 22 km away to the north coast of Deli Serdang District.

According to the Free, Prior, and Informed Consent: Guide for RSPO members (2015) it is not necessary for PT TDI to conduct FPIC in the studied area. The area has already been used for rubber and palm plantations for decades. None of land in the concession area (HGU lincence) is owned by local community. Nevertheless, the company needs to inform the local communities regarding its plan of converting the rubber plantation into oil palm plantation.

From field identification and interview processes, it has been gathered that there are no legal right other than the right of PT. TDI within the proposedc project area. From the interview process with the local communities, it is cleared that the proposed conversion project area has always been legally controlled by PT. TDI before there were any villages existed within the proposed project area. Surrounding communities have all acknowledged the legal boundaries of proposed project area controlled by PT.TDI.

Table 10 shows the total carbon stock from various vegetation type. Rubber crops has larger number of carbon stock actually, and will be cleared gradually to be oil palm. Both rubbers and oil palm is not categorize as high carbon pool class vegetation in this study according to HCSA guideline issued by RSPO. Meanwhile in the High Carbon pool class there is 624.37 ton C stock saved in Low density forest at Arboretum area and old shrubs in low- lying swampy area, part of riparian zone, and other low dense vegetation land. The figure 12 below shows the distribution of carbon stock across the PT. TDI concession.

Table 10. Average Carbon stock on each vegetation class across the PT TDI concession

Vegetation class	Area (ha)	Average Carbon stock (ton C/ha)	Total Carbon stock (ton C)
Vegetation Class of High Carbon Pool :			
Low to medium density forest	1.55	112	173.60
Old shrubs	11.13	40.5	450.77
Total 1			624.37
Vegetaton class of Non-High Carbon pool :			
Rubbers crops	588.66	72.8	42854.45
Young shrubs/bushes	61.19	3.2	195.81
Oil Palm (3 year old/TBM1)	70.61	4.41	311.39
Main nursery (palm)	10.37	1.2	12.44
Total 2			43374.09
TOTAL			***43998.46***

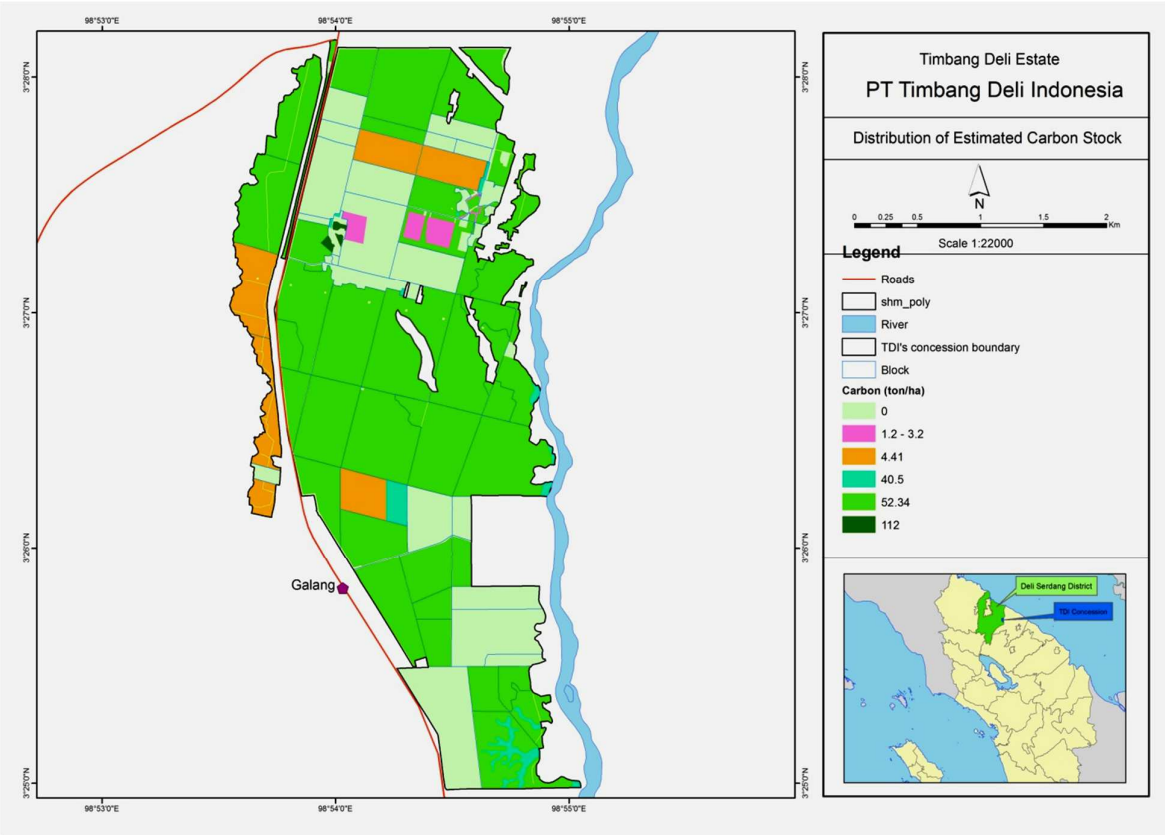

Figure12. Distribution of carbon stock for PT. TDI concession

The concession does not contain any primary forest or peat land. Its vegetation is dominated by rubber crops. For the class of high carbon pool, the highest carbon stock is located on low dense forest at arboretum tree collection with area of 1.55 (this arboretum area is not identified as HCV), and some on the riparian zone and lowland area to be set aside as HCVs with total area 2.82 Ha.

3.5.2. List of references used for HCS assessment

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3.5.3. Summary of GHG Emissions

The preceding section makes recommendations for set-aside areas for protection as HCV management areas and has pointed out the inexistence of high carbon stocks areas within the concession. Therefore, an area of 2.82 ha (representing 0.29% of the total concession areas) has been set aside as HCV management areas for protection, and 1.55 ha (0.16%) of arboretum area should be kept as the remaining high carbon stock area. Therefore, the remaining land of 967.82 ha (99.55% of the total gross concession areas) may be used for oil palm development (planting and estate infrastructure).

The section below categorises the anticipated emissions under the recommended scenario into two categories: field emissions and mill emissions.The summary of the total estimated emissions and sequestration is presented below sections.

For the PT. Timbang Deli Indonesia proposed concession, the establishment of the new oil palm plantation, through land preparation operations including for rubber tree cutting, seedlings transportation, and plantation maintenance will certainly contribute to the emission of GHG into the atmosphere. Furthermore, in the future, the transportation of fresh fruit bunches from the estate plantations to the mill as well as the use of fertilizers will add to this GHG emissions. However, protecting natural carbon sinks like trees contribute to sequestrating part of GHG. In addition, using new technologies and renewable energies, making older equipment more energy efficient, or changing management practices are known to contribute to GHG mitigation. Therefore, the mitigation plan team has identified key strategies to enhance GHG sequestration and reduce their emission.

a). Field emissions

The main sources of emissions are identified from:

- Land use change
- Transport fuel
- Fertilizer usage

The concession does not contain any peatlands, and totally consist of mineral soils. Therefore, there are no anticipated emissions from decomposing peat. The figure 13 below summarises the final expected emissions from land clearance, fuel usageand fertilisers. Default values have been used for estimating fertiliser use, fossil fuel usage and transportation, meanwhile land use change use value from the field measurement. The emission calculation is projected for the next 13 years according to land conversion plan. A total of 2053.64 ton CO2e will be emitted during land conversion and operation until year 2030.

The findings from this assessment demonstrate that the concession area consists of rubber, shrubs, infrastructure/housing, nursery and small portion of riparian zones and low to medium density vegetation (trees collection). The carbon sequestration potential of the current vegetation at PT. TDI is very low and converting the existing rubber concession to oil palm could yield a potential gain in carbon stocks. In addition to this, recommendations have been made for setting aside of areas for conservation purposes. It is expected that this would also serve to store some additional carbon of up to 624.37 tones

b). Mill emissions

This operation does not come with any new mill establishment. All FFB produced from the new oil palm plantation would be sent to the existing mill at Bukit Maradja-Sipef.

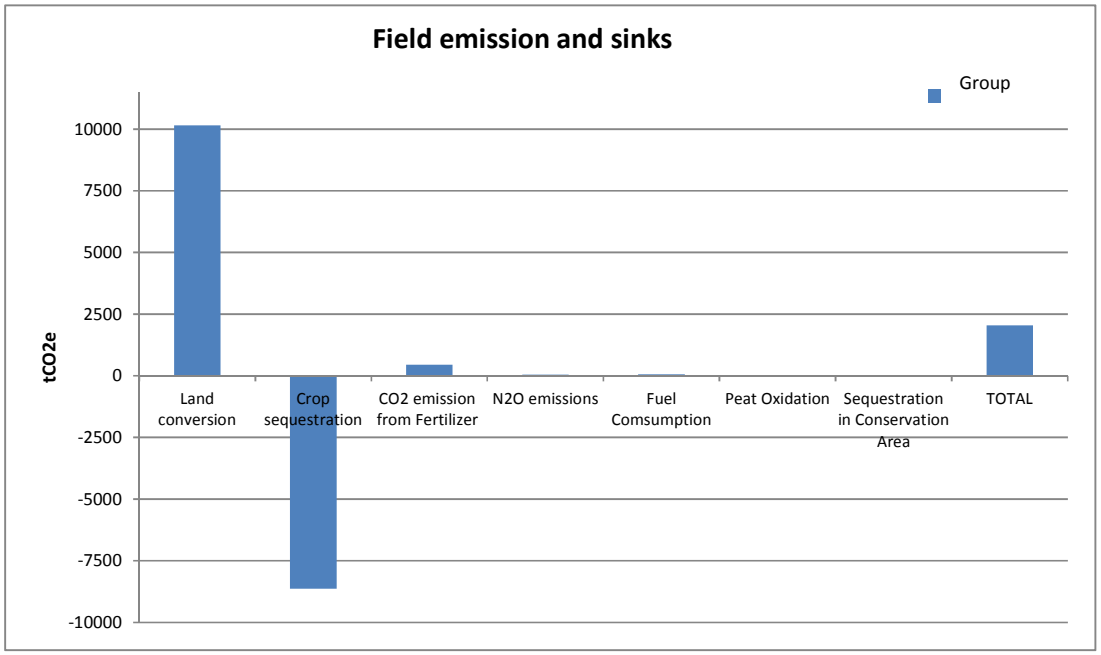


Figure 1: Field emissions from the proposed conversion area.

3.5.4. Scenario analysis

Since no significant carbon sink was identified, two main scenarios were considered and analysed. The estimation of the GHG emissions were done using the RSPO PalmGHG Calculator Version 3.0.1.

Scenario 1
This first scenario is based on the recommendations of the HCV assessment and assumes that there is a minimum set aside area of 2.82 Ha. In addition the arboretum area would be kept and mantained with total area of 1.55 Ha. The remainder of the concession is planted and developed. The analysis shows that with this scenario, there would be a net emission of 2,053.64 tCO2e. This scenario assumes that the planted area will be able to sequester about 8634.33 tCO2e, whilst the land clearance would emit 10,160.06 tCO2e.The conservation credits in this scenario is about 25.86 tCO2e.

Scenario 2
The second scenario is based on the assumption that there are no set aside areas in the concession and that the entire areas including the arboretum area will be replaced with oil palm plantations. This increases the amount of emissions from land preparations from 10,160.06 tCO2e in Scenario 1 to 10,215.65 tCO2e. The crop sequestration under this scenario would be slightly higher, the additional emissions from fertiliser and fuel use means that this option would yield a net emission of 2,108.69 tCO2e.

The table 11 and the figure 14 below present the results of the analysis of both scenarios.

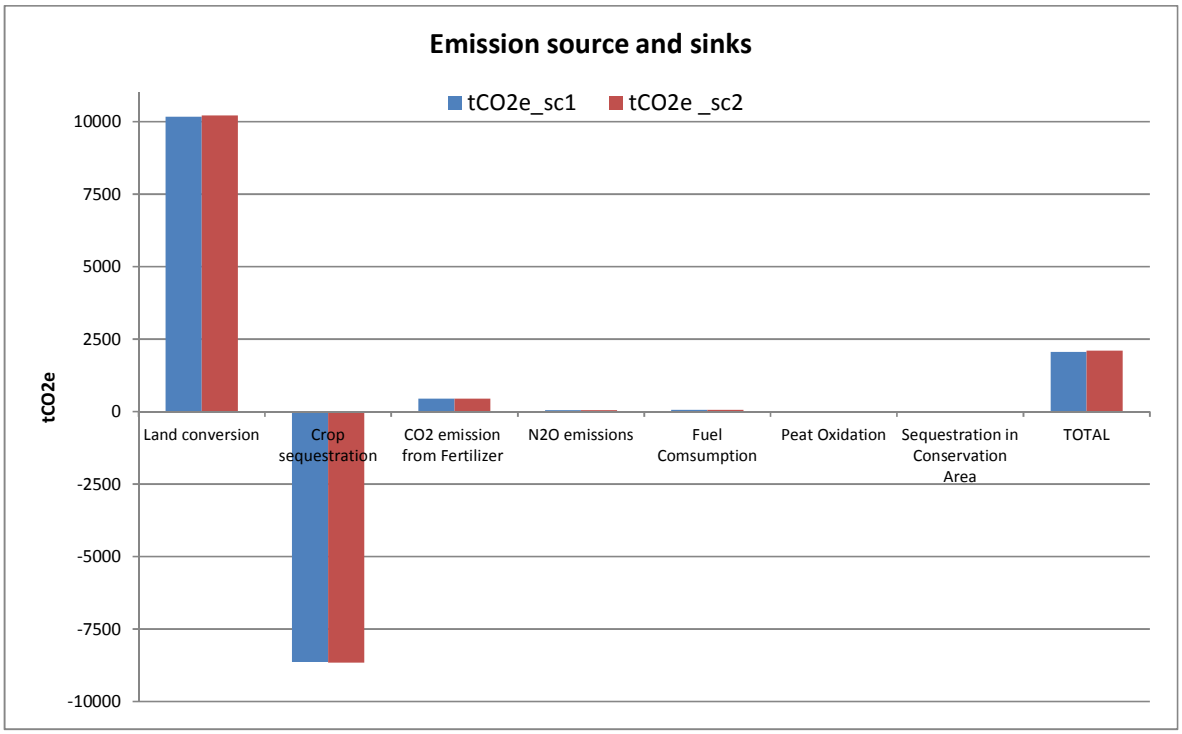
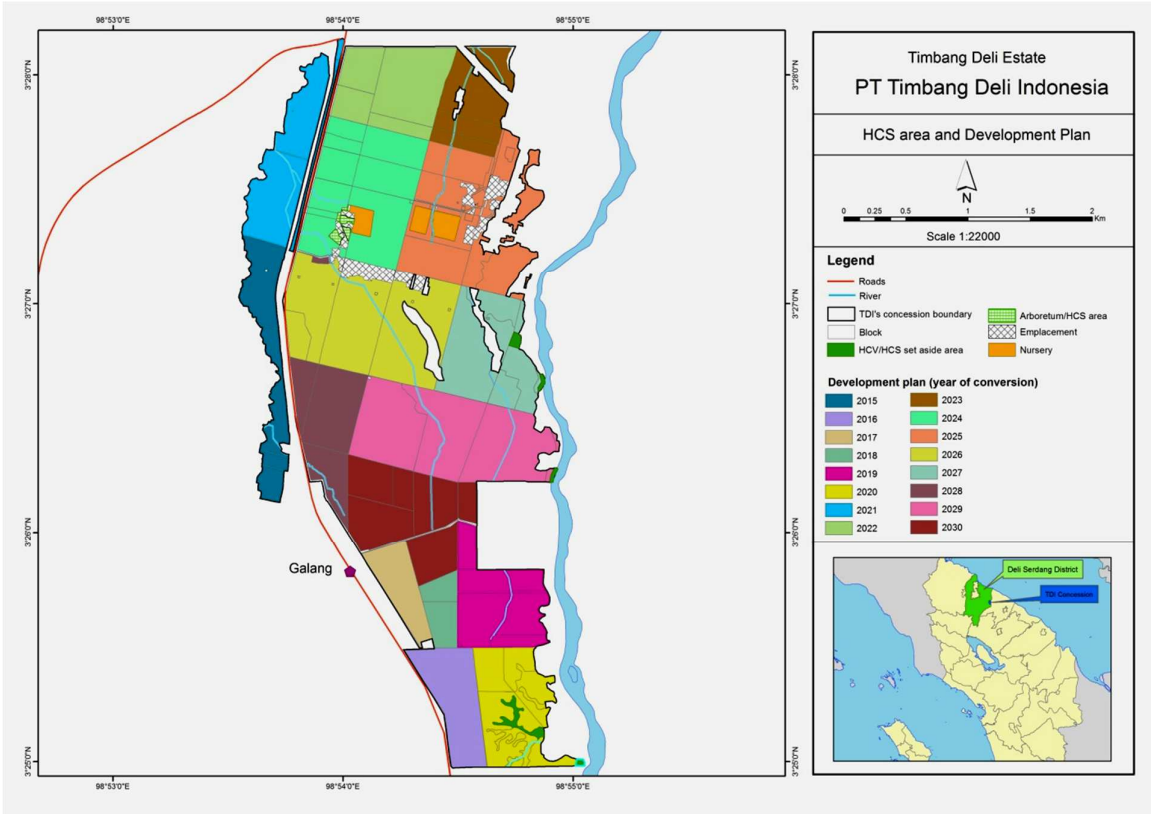


Figure 14. Expected emissions from proposed conversion area with two scenarios

Table 11. Carbon emissions/sequestration under two different scenarios.

Set aside areas plus arboretum	**Scenario 1** **4.37 ha**	**Scenario 2** **0 ha**
	t CO2e	t CO2e
Land conversion	10160.06	10215.65
Crop sequestration	-8634.33	-8660.73
CO2 Emission from Fertilizer	447.38	447.38
NO2 Emissions	46.58	46.58
Fuel Consumption	59.81	59.81
Peat Oxidation	0	0
Sequestration in Conservation Area	-25.86	0
POME	0	0
Mill Fuel	0	0
Mill credit	0	0
Net emission	**2053.64**	**2108.69**

Because of the landscape of the proposed concession is dominated by rubber crops, the emission potential of the vegetation at PT TDI concession is very low. Based on the obtained results, the two scenarios were not significantly different from each over. The two scenarios would contribute to a small net emission about two thousand tonnes of CO2. It appears that, the oil palm development replaces rubber at PT TDI will contribute not significant emission differentiation between the two commodities. However, the first scenario will be selected for the conversion plan in PT Timbang Deli Indonesia consession, as shown in Figure 14 below.


98°53'0"E
98°54'0"E
98°55'0"E
3°28'0"N
3°27'0"N
3°26'0"N
3°25'0"N
Galang
Timbang Deli Estate
PT Timbang Deli Indonesia
HCS area and Development Plan
N
0 0.25 0.5 1 1.5 2 Km
Scale 1:22000
Legend
Roads
River
TDI's concession boundary
Block
HCV/HCS set aside area
Arboretum/HCS area
Emplacement
Nursery
Development plan (year of conversion)
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
2027
2028
2029
2030
Deli Serdang District
TDI Concession

Chapter 4

Summary of Management Plans

4.1 HCV Areas Management and Monitoring Plan

In order for PT Timbang Deli Indonesia to meet the RSPO certification requirements particularly those related to the NPP, it is crucial that the company implements therecommendations described in the HCV assessment report. To ensure that the field operations follow the steps indicated in the report. PT. TDI will designate a person responsible for monitoring the implementation in the field of the measures for protecting and maintaining HCVs in the concession. This person will be given the authority, time and resources to train staff properly, prepare robust Standard Operating Procedures (SOPs) including recommendations contained in the detailed HCV report and to organize the plan activities before the conversion operations, and to monitor them in the field. Summary of the Mitigation Plan will be elaborated and adopted by the management of PT TDI to ensure effective maintenance and enhancement of the identified HCVs. Table 12 below describe some recommendations onHCV's management and monitoring based on threats finding.

Team responsible for develop and implement HCV management and monitoring plans

a. Ahmad Subagyo : Director of PT Timbang Deli Indonesia.
b. Hamdani : Senior Manager Sustainabilty SIPEF Group

Table 12. Recommendation on HCV's management and monitoring

HCV	Threats	HCV Management	HCV Monitoring
1	• Habitat loss of some protected animals • Land clearing for crops or optimalization on swampy low-lying areas. • The killing of protected animals in conflict with humans	• Maintaining the integrity of the habitat, including the establishment of HCV areas and security patrols • Determining the status of HCV areas in low-lying areas and signboards installation • Prepare SOPs for handling conflicts with wildlife and preparing local communities related to conflict management with animals • Monitoring training, basics of animal identification, • Continous socialization and stakeholder engagement	• Regular monitoring of the presence of protected animals in the area • Record any incidents of conflict, and damage or decrease in the HCV areas • Corrective actions record
2	Reduced water quality	• Installation of sign boards for restricting or banning chemical applications in riparian areas and disseminating to spraying employees. A 5 meters free	• To check water quality periodically (at least every 6 months) at water monitoring points (inlet-outlet river), either visually or laboratory test

HCV	Threats	HCV Management	HCV Monitoring
		zone of chemical application for all the water bodies (small rivers) and 30 meters along the Ular river. • Prepare SOPs for banning chemical application Implement ground-based soil and water conservation activities, such as water point (if required) Making of sediment trap / gully plug in stream flows or river branches, especially those flowing into the (river) area of HCV Enrich trees and other vegetation species to strengthen the soil bonds on the Ular riverbank • Monitoring training, water quality measurement, stakeholder engagement	• Check erosion around the Ular River periodically • Corrective actions record
3.	Conversion on riparian zone and other HCV areas	▪ Socialization to the surrounding community regarding the boundaries of HCV areas and important HCV functions Collaboration and cooperation with communities, government (from village to district level), as well as NGOs related to river conservation and conservation programs ▪ Socialization and assistance to LC contractors on the boundaries of HCV areas to avoid over-clearing	• Documentation of socialization with relevant stakeholders • Monitor the boundaries and area of HCV area periodically (at least once a month) • Document the land clearing process • Evidence of socialization and understanding of buffer zones management and monitoring recommendations and requirements • Corrective actions record
	Waterbodies siltation	• Strengthening of river cliffs prone to landslides with technical (short-term) and vegetative (long-term) Enrichment of vegetation in river borders that have been degraded (suggested enrichment with native tree species and / or with deep	• Record number of landslide or high erosion locations Monitor the physical condition of civil engineering buildings Monitor vegetation growth (% grow) • Check erosion around

HCV	Threats	HCV Management	HCV Monitoring
		and strong rooting and dense canopy)	the Ular River periodically • Corrective actions record

4.2. Social and Environmental Impacts

As mentioned previously, social and environmental impacts of conversion plan is not significant. Nonetheless, several impacts or issues need to be addressed, in particular to enhance positive impact of the presence of PT TDI and to make sure potential negative impact can be managed properly.

Table 13. Recommendation on social impact issues management

Issues	Management plan	Responsibilty
Micro climate change and water conservation due to land conversion and crops replacement	• PT TDI will develop proper SOPs on water conserving and maintain all the rivers /streams functions • Rubber conversion will not take at once land clearing, but gradually until year 2030 to provide better adaption. The existing tress in arboretum, along the roads, housing, office as well as at river banks will be kept and increased	Plant team, HCV team and Community relation staff under direct supervision from Director
The existing rubber plantation has been habitat for certain wildlife. Eliminating the rubber plantation will eliminate habitat of the wildlife and that in turn the wildlife itself	There is no critically importar species within the concession. However the TDI Management should provide proper SOP on wild animal protection and conduct regular monitoring on wildlife existences	HCV team and Community relation staff under direct supervision from Director
Worries on the change of different working systems between rubber and oil palm cultivation. As employee, many of community and their family live within the company's rubber plantation.	• PT. TDI plans to increase the involvement of the local community in the conversion activities either by employing them or hire them as a contractor to reduce any negative perceptions. • PT TDI will provide necessary tranings in palm oil cultivation	Plant team and Communication relation staff under direct supervision from Director

Encouraging the development of socio-economic life of the Deli Serdang District and Galang Sub-district; and 4 villages surrounding the TDI concession.	• Continue and improve on supporting the surrounding community • Give opportunity to the local villagers to be company partner • Continue a regular social responsibility program and suitable for community needs as long as it does not conflict with the company's mission	Communication relation staff under direct supervision from Director

4.3. High Carbon Area and GHG emission

a). Managing and monitirong the HCS area and set aside HCV area

Both arboretum and low lying swampy areas should be maintain areas as high carbon pool. The HCS Area Management and Monitoring Activities will follow the recommendations of the HCV assessment as these HCS areas are generally also HCV areas. Summary as follows:

- Delineation of conservation area field to obtain accurate acreage as well as inauguration of HCS / HCV area. This process is also part of conservation area with good vegetation cover and extensive landscaping.
- Socialization to the community and worker regarding land use plan and the existence of HCS area. The improvement of the safety of conservation areas with patrols routinely prevents land clearing which is the HCS area
- Keep and maintain area with trees such as arboretum,and increase vegetation in housing, offices, and roads side.
- Provide a documentation and evidence of actions on HCS /HCV areas management. Monotoring activitites will follow the HCV monitoring as describe above

b). Managing emissions from fertiliser

Emission from fertilisers is a major source of GHG on the plantation. In order to reduce these emissions, the operation will optimise the use of fertiliser in the plantations. All forms of fertiliser use shall be justified following periodic soil and tissue sampling, and shall be applied by trained staff with supervision from management. Fertiliser would only be applied to address identified deficiencies from tissue sampling reports. The company will also strive to use organic matter from its operations to complement soil nutrition and physical properties. Typically, the operation will ensure that EFB is returned to the field, palm fronds are stacked. The company would also make optimal use of nitrogen fixing cover crops in its operations to help minimise the amount of organic Nitrogen that would be required for optimum yield.

In order to monitor fertilizers, the company will provide a records of fertilizers used including organic matter during the operation and evaluate the effectiveness of fertilzation.

c). Managing FFB transport

To minimise emissions from FFB transport, the operation would ensure the use of trucks that are very fuel efficient and large enough to minimise the number of trips. Additional measures to be implemented would include regular and scheduled maintenance of vehicles to maintain their fuel efficiency whilst sourcing only highly quality fuel that is guaranteed to give optimal performance of vehicles. Appropriate measures will be taken to ensure road planning, design and construction are carried out in a way that minimise the travel distance between the harvesting sites and the processing mill. It is recommended that the company develops an implemented road maintenance programme that keeps the roads in good condition all year around. This would also be essential in reducing the amount of fuel used in FFB transport.

Report and recording on fuel comsumptions, roads maintainance program, vehicle maintainance program must be prepared to provide evaluation and monitoring on GHG emission. A regular vehicle emision test is also should be taken.

Team responsible for the mitigation plan

For sustainability and in order to assure that plantation development does not adversely affect the structure and functioning of the landscape containing the concession, PT TDI has constituted a team to draw a mitigation plan and assure its implementation on the ground(Table 13). Below isthe list of the members of the team and their position in the company.

Table 13. List of the TDI's team responsible for the mitigation plan.

Name	Office location	Position
Ahmad Subagyo	Deli Serdang, North Sumatra, Indonesia	Director
Hamdani	Medan, Indonesia	Group Sustainability Manager
Baihaiki	Deli Serdang, North Sumatra, Indonesia	HSE

Acknowledgement of Internal Responsibility by Assessors

Signed for and on behalf of PT. Kompasia Enviro Consultant

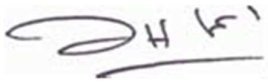
Henry Marpaung

Team Leader
Date: December 27, 2016

Acknowledgement of Internal Responsibility by PT Timbang Deli Indonesia Management

The management of oil palm grower, PT Timbang Deli Indonesia, signs to confirm that the necessary assessments have been done and completed in accordance to the relevant RSPO procedures.

Signed for and on behalf of PT Timbang Deli Indonesia



Ahmad Subagio
Director
Date: November 20, 2017