ASSESSMENT SUMMARIES & MANAGEMENT PLANS

Name of Grower : PT Gemilang Makmur Subur

Name of Subsidiary : Bumitama Agri Limited

RSPO Membership No. : 1-0043-07-000-00 since 7 October 2007

ASSESSMENT SUMMARIES AND MANAGEMENT PLANS :

1. Overview and background

From the period of 2004 to 2007, PT GY Plantation collaborated with PT Ketapang Mandiri regarding develop of plantation. However some of these activities included planting activities on areas with status of production forest areas. Location permit on behalf PT GY Plantation was terminated by Head of Ketapang District so that PT GY Plantation stopped operation in December 2010.

Earlier in 2011, Bumitama had entered into a management contract or master cooperation agreement with PT GY Plantation; PT Landak Sawit Mas (PT LSM) to run and manage the plantation which happens to belong to one of the substantial shareholders of Bumitama. On the December 2011 that PT Karya Manunggal Sawitindo (PT KMS) and Westbrook International had taken over this area. Based on notary act no.29 that PT GY Plantation had **changed its company name to** PT Gemilang Makmur Subur (PT GMS) dated on 18 July 2012. The shareholder of company are PT Karya Manunggal Sawitindo (minority shareholder) and Westbrooks International, PTE Ltd (majority shareholder).

PT GMS get claim from Friend of the Earth (FoE) and Wahana Lingkungan Hidup (Walhi) on September 2013 that the company had conducted operation in forest areas with permit that was unclear. One of claim is the company should return of right for plantation management to communities.

The management contract was terminated by both of the parties in July 2014 because the legal matters of this company had taken longer than expected to be rectified and the slow rectification had resulted in concerns of Bumitama stakeholders.

Since October 2015, PT GMS planted areas was allocated for four scheme smallholder areas (KUD Rungau Sejahtera, KUD Istana Pawan Mandiri, KUD Mitra Penjalaan Permai and KUD Bukit Tunggal Sejahtera) from some companies under Bumitama group (excluding the NPP areas).

On 2 June 2016, there was an initial agreement of sell and purchase of shareholder in PT GMS between Westbrooks International PTE Ltd with PT Bumitama Sawit Lestari where both parties agreed that hand over of shareholding will be carried out after all requirements and term & condition had been complied; compliance within the maximum of 12 month from the date of the agreement.

Earlier since 1 November 2011 (based on master cooperation agreement) that PT Bumitama Gunajaya Agro had entered into a management contract with PT GMS; to run and manage the plantation PT GMS which happens to belong to one of the substantial shareholders of Bumitama. Since 31 July 2014 that PT Bumitama Gunajaya Agro be terminated the right and obligations under clause 1 to 3 of the Master Cooperation Agreement.

PT Gemilang Makmur Subur (PT GMS) areas is ± **5,190 ha** (based on location permit no.272/PEM/2015 dated on 2 April 2015 from Head of Ketapang District) but audit team was initially unsure that PT GMS areas are inside the location permit because audit team had not been received map of location permit which readable or clear visual until later.

New planting areas which is part of the company areas with total areas is ± **473 ha** (based on land use map (**figure 3**)) where ex-nursery (ex-bibitan) was excluded because it has planted above year of planting 2008 (**Figure 4, Table 1** and explanation on HCV report – page 7 (subsection 1.2 – paragraph 7))**.** The area have year of planting 2012 (> year 2010) and which has not gone through the NPP process so that sanction is applied to company. Moreover, the company have year of planting 2005 to 2008 but has submitted the LUCA to the RSPO secretariat but have yet to receive evidence the company liability as the computation is still being reviewed since November 2016. The estate location map and plantation developing plan map can be seen in **Figure 3**.

PT Gemilang Makmur Subur (PT GMS) has obtained the following legal documents such as :

1. Location permit

Head of Ketapang decree no.272/PEM/2015 dated on 2 April 2015, covered area ± **5,190 ha** in Matan Hilir Utara sub district, Ketapang district, West Kalimantan Province which was illustrated on location permit map. Validity period for location permit is 3 (three) years from the date of location permit issuance date.

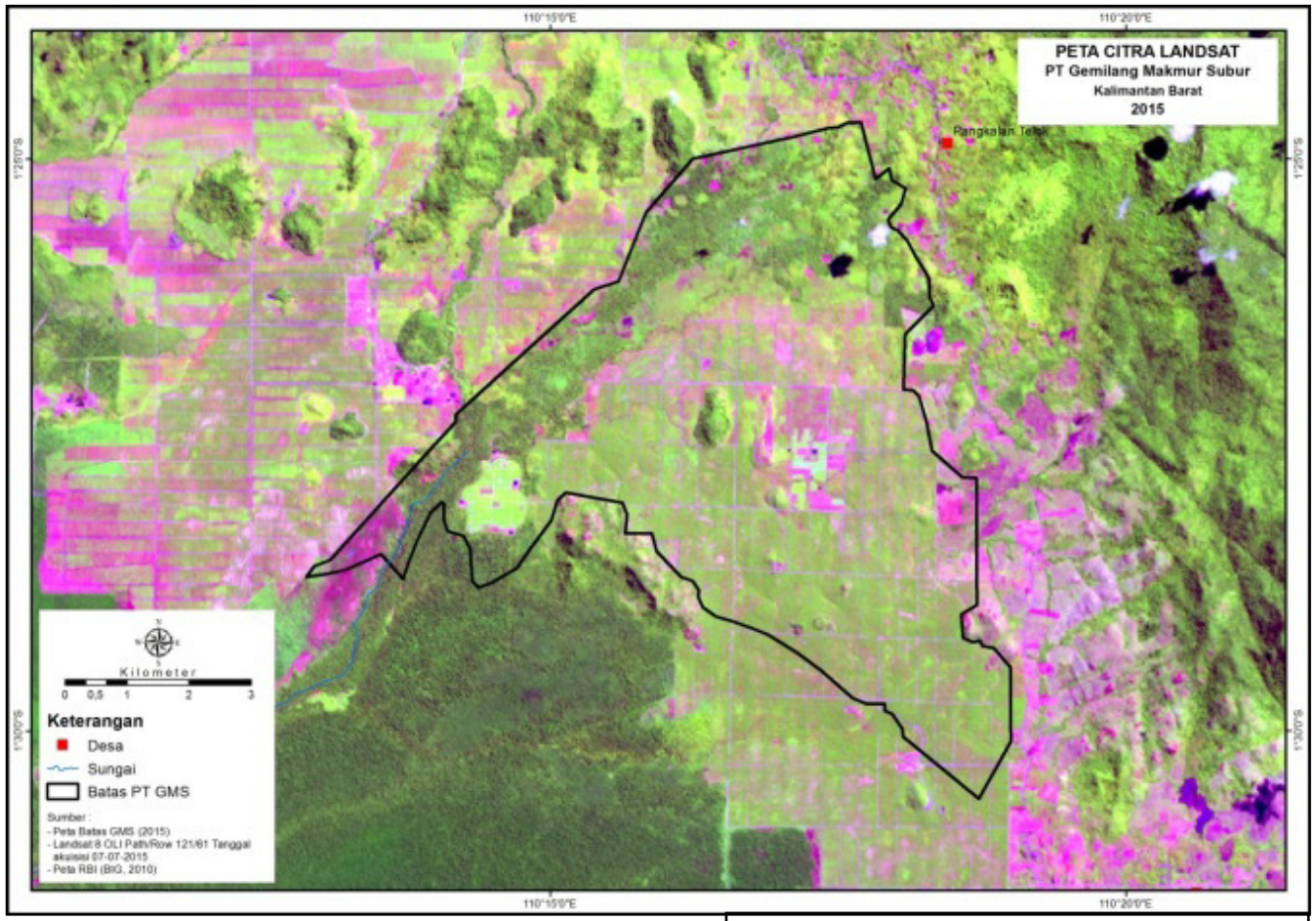
2. Plantation Business Permit (Izin Usaha Perkebunan) :
   Head of Ketapang District decree no.773/DISBUN-D/2015 dated on 27 November 2015, covered area ± **5,190 ha** with type of commodity is oil palm and production capacity of mill is 60 ton FFB/hour in Laman Satong Village, Matan Hilir Utara Sub District, Ketapang District, West Kalimantan Province.
3. Environmental document :
   Head of Ketapang District decree no.743/KLH-B/2015 dated on 3 November 2015 regarding environmental permit with scope of study was cover development of palm oil plantation of ± **5,190 ha** and palm oil mill with production capacity of 45 ton FFB per hour.
4. Based on Minister of Forestry decree no.SK.936/Menhut-II/2013 dated on 20 December 2013, Minister of Forestry decree no.SK.733/Menhut-II/2014 dated on 2 September 2014, Head of Forestry Agency letter in West Kalimantan Province no.188/Dishut-II/Ppk/2014 dated on 29 January 2014 and technical review from Forest Areas Agency Region III (letter no. S.755/BPKH.III-2/2014 dated on 21 July 2014) that PT GMS area on **other land uses (APL)**. Whereas, based on spatial plan of West Kalimantan Province (year 2014-2034) is **plantation cultivation area** (kawasan budidaya untuk perkebunan) and based on indicative moratorium map (PIPPIB) 8th revision year 2015 that **virgin forest and peat area not available** inside PT GMS areas.
5. Deed no.29 dated on 18 July 2012 by notary of Ida Waty Salim, SH, M.Kn regarding **change of company name** from PT GY Plantation to PT Gemilang Makmur Subur and it has got approval from Ministry of Justice & Human Rights (no. AHU-46352.AH.01.02.Tahun 2012 dated on 31 August 2012). The shareholder of company are PT Karya Manunggal Sawitindo (minority shareholder) and Westbrooks International, PTE Ltd (majority shareholder); subject to changes in shareholding as per sales and purchase agreement dated on 2 June 2016. Whereas, PT GY Plantation was establish since year 2004 with based on notary act no.5 date on 12 February 2004 by notary of Indah Prastiti Extensia, SH and has approved from government (decree no. C-053238.HT.01.01.TH 2004).
6. Land information letter for oil palm plantation no.526/263/DPU-E dated on 27 March 2014 from Head of Ketapang District.

2. History of the landscape

The interpretation of land cover using satellite images produced five land cover classes, namely : secondary forest, shrub, bush, fields and open land. However the direct observation on the field showed seven classes of land cover in the concession area of PT GMS, namely (i) degraded secondary forest, (ii) open arable land, (iii) grass / shrubs former arable, (iv) young thicket , (v) water bodies, (vi) fields and (vii) young palm). The dominant land cover is oil palm and shrub land. In the concession area of PT GMS, there are about 299 hectares of fields which belongs to the community, which is local community empowerment program of the Gunung Sari village. The **figure 5** shows the state of the land cover in terms of the spatial approach using Landsat satellite Citra 8, dated July 2015.

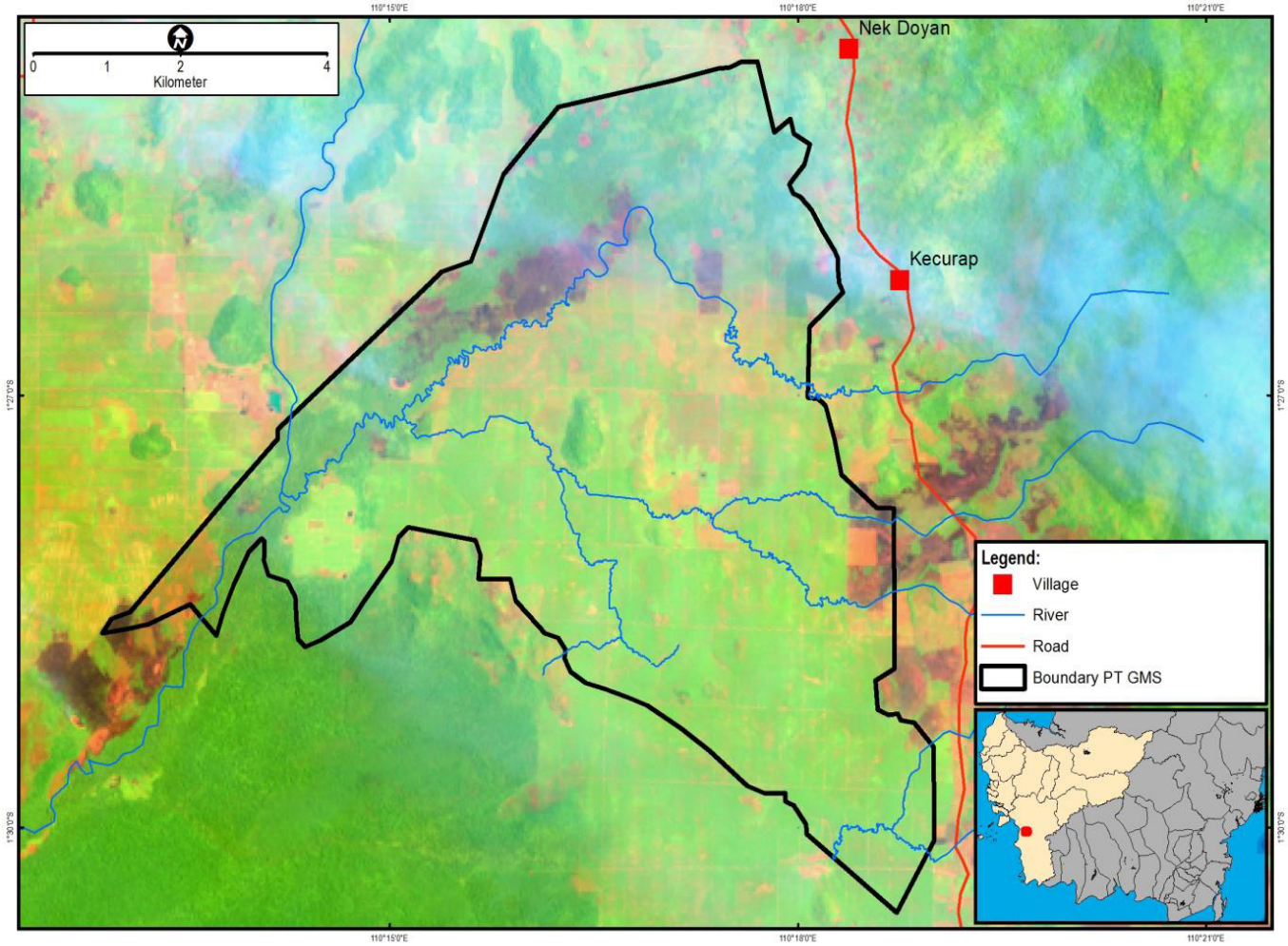
The unplanted areas of around 2,000 ha have not yet been acquired by PT GMS from the local people. However it is to be noted that these locations are prone to fire, most times as a result of land clearing process by the local people for small scale subsistence farming, and hunting by local communities. Communities that have interaction with area location permits of PT GMS are Hamlet of Nek Doyan, and Village of Laman Satong communities. These communities have long practiced shifting cultivation techniques. In addition, they also supplement their revenue from illegal logging and wildlife poaching. Although the Dusun Nek Doyan residential community is outside the concession of PT GMS, but it is however very close, only about 500 meters away. Currently, part of the area permit

of PT GMS that has not been converted into oil palm plantation are areas where the local people carried out some wood cutting activities, hunt and poach wildlife and open small fields for vegetables and other type of planting. The work life circle/activity begins with logging in the forest/ woods, burning of land, and then planting land with rice or yams and or nuts on the plain area whilst the swamp area is planted with rice marsh. This circle/activity still continues until today. The land will be reopened after the fertility of the soil regain naturally, usually around 5 to 10 years. The traditional shifting cultivation system which has been on-going for generation is still carried out by local people in the area. Usually the local people start slashing in June and July, then in August carried out burning, and September planting with harvest in February and March.



Land Cover July 2015
Source: *Citra Satelit Landsat 8 OLI path/row 121/61, Juli 2015*

Figure 5.a. Land cover period July 2015



Land Cover September 2015
Source: *Citra Satelit Landsat 8 OLI*

Figure 5.b. Land cover period September 2015

3. Assessment process and methods/procedures

3.1. Social Impact Assessment

- **Dates assessment were conducted**

The SIA field activities of PT Gemilang Makmur Subur was held for five days along the effective date of October 12-16, 2015. The location of the study are Nek Doyan sub village, Laman Satong village, Matan Hilir Utara Sub District, Sepahan sub village, Simpang Tiga Sembelangaan village, Nanga Tayap Sub District, Estate, Office and worker housing.

Meanwhile, in terms of the scope of the social entity of the Social Impact Assessment includes : 1) the local community social entities, such as the people who live in residential areas around the site including personal estates, farmers or groups of farmers. 2) social entities in the environment of employees, suach as workers, staff, and their families who live daily in a neighborhood at PT Gemilang Makmur Subur location permits.

- **Assesor and their credentials**

The Social Impact Assessment of PT GMS was carried out by an independent consultant from PT Gagas DinamiGa Aksenta whish is located at Jl. Gandaria VIII/10, Kebayoran Baru, DKI Jakarta Province, Indonesia. Phone contact : +62 21 739 6518 and email : aksenta@aksenta.com. The team members consist of consultant includes :

a. Andri Novi Hendrarto as coordinator of team, social studies of culture and social relationship. Email address : andri.novi@aksenta.com.
b. Iwan Rosyidi as member of team, labour issue and community development. Email address : iwan_rosy@yahoo.com.
c. Afwan Afwandi as member of team, community development and social economic. Email address : aafwandi@gmail.com

- **Assessment methods**

Basically, the development of plantation area would affect the pentagon assets (human capital, natural capital, financial capital, social capital and physical capital) in the surrounding area. The approach of this study of Social Impact Assessment was by learning the present existing condition in PT GMS, particularly the condition which was related to socio-economic condition, socio-economic impacts of the company toward the surrounding the community, and the community's perception. Based on the existing condition, compilation and preparation was conducted for documenting the SIA and social management plan which contain activities that should be conducted to create ideal condition (the desirable condition). Sampling technique being used were purposive sampling (samples were selected on the basis of researcher's judgement; who decided which of those samples were the most suitable to be selected for the purpose and objectives of the research) and simple random sampling (technique of sample collection which gave the same chance for all population elements to be taken).

Implementation of the Social Impact Assessment (SIA) on the field reached by following the rules or principles following :

a. Participatory; identification of issues and extracting information to be participatory. This participatory approach to seat the participants as subjects to map the social issues that happened, express opinions and aspirations, as well as involved in the design and management of change.
b. Multiparty; identification of issues and extracting information carried multi-stakeholder involving parties that are directly or indirectly provide or receive impact.
c. Rapid and Ex-ante; identification of issues and extracting information performed quickly and more based on the alleged (forecast) against tendencies changes rather than based on accurate factual data as a solution to the limitations of the approach Social Impact Assessment, as well as of the limited time available.

d. Appreciative; identification of issues and extracting information positively guided, not limited only to find out the gaps (gap) is happening but also to explore expectations, potential, and ideas to find solutions to the social issues that occur.
e. Cycle Social-Learning; social impact assessment is not something linear process that once finished but cyclical process, which serves as the processes of social learning to respond to the environmental changes that occurred.

Aspect of the study of SIA document are :
a. Layout Size and Demographics Hamlet Region
b. Ethnicity and Religion
c. Culture and Tradition
d. Livelihood Chronology of Sub village and Utilization of Natural Resources
e. Education
f. Health, Water and Sanitation
g. Energy
h. Transport, economic facility and communication
i. Community interaction with company
j. Pentagon asset overview (human capital, social capital, natural capital, physical capital and financial capital)

There are 5 (five) approach regarding Data Collecting :
a. **Document searches and secondary data** : This method is used to obtain a recording condition of the implementation and management of mill by the company; to obtain demographic data as a background of local communities social life.
b. **Dialog** : This method is used for the purpose of identifying the parties, explore issues which could result, exploring expectations, ideas and aspirations for solutions to issues that occur, conducted through meetings both formal and non-formal and with special topics (Focus Group Discussion).
c. **Field observation :** This method is used to directly understand the facts that indicate the occurrence of field issues and social impacts that occur.
d. **Indepth Interview :** to explore and acquire a deeper understanding of the issues that arise conducted in-depth interviews with key figures, the informant was selected based upon the knowledge possessed or parties who are directly impacted.
e. **Triangulation** : Integrated combination of the above methods to mutually verify the issues, opinions, and ideas that emerged.

- **Data Analysis Methods and Information**

From the field findings were obtained, then analysis to understand more fully, and the context of their mutual relations, and then do the synthesis and withdrawal conclusions. Framework for analysis of the results is done by using Criteria that have relevance to the social aspects of sustainability as well as changes in asset pentagon element. In addition to the impact analysis conducted with respect to the guidelines regarding the size of the impact is important. Each issue has a significant impact on the described circumstances and elements asset pentagon.

The stages of the implementation of field activities are :
1. Opening Meeting; meeting with the company, represented by the Management of plantation and mill. In this meeting conducted orientation field activities; socialization of Social Impact Assessment, the analysis of the parties, scheduling and technical preparation of the field;
2. Stakeholders Mapping and Field Scoping to obtain preliminary data according to the perceptions of key stakeholders operational executor.
3. Field observations; carried out on locations where issues or social impacts arise or occur, as well as other locations deemed important to find facts on the ground as an indication of changes, including taking photographs;
4. Indepth Interview; taken against the executive operations of the company, a leading figure formal, informal leaders, government officials (village, sub-district and district) and community members from various professions and social strata around the company's operations.

5. Focus Group Discussion or FGD; with employee representatives and the plantation units from all parts of the plant (station).
6. Document Review; obtained from the documents provided at the company as well as other documents from other relevant sources available on site, as guidance to understanding of the social and environmental context;
7. Closing Meeting; delivering preliminary findings to the management company, clarified that findings, ask for feedback and provide temporary recommendations.

- **Involvement of Affected Parties in Social Impact Assessment process and development.**

Evidences showed regarding affected parties participations were :

- List of attendant, 14 October 2015, FGD of SIA assessment in Workers housing facilities, Block F attended by 9 people (workers representatives).
- List of attendant, 14 October 2015, FGD of SIA assessment in Nek Doyan Sub Village, attended by 25 people (community representatives).

Whereas, FGD with Sepahan sub village, Simpang Tiga Sembelangaan village and Nanga Tayap District has not yet been carried out so that no evidence for activities it.

3.2. Environmental Impact Assessment

- **Dates assessment were conducted**

Environmental Impact Assessment (EIA) has carried out year 2015 (until November 2015) with the step of assessment since develop of KA-ANDAL till envirnmental permit issued include of public announcement on Tribun newsletter – Pontianak dated on 5 August 2015.

Meanwhile, in terms of the scope of environmental document are plantation of oil palm amount of 5,190 Ha and palm oil mill with capacity of 45 tonnes FFB/hour in Matan Hilir Utara Sub District, Ketapang District, West Kalimantan Province

- **Assesor and their credentials**

Environmental Impact Assessment (EIA) document of PT GMS was prepared by PT Delta Ekotrop Rayaindo year 2015 which located in Jl. Karna Sosial No.25B, Pontianak – West Kalimantan Province.

The environmental impact assessment (EIA) or AMDAL document was prepared by professional person which have competency requirement. The expert team consist of :

No.	Name	Position	Expertise
1	Derry Yulianto, S.Hut.	Team Leader	• Bachelor degree of Forestry • AMDAL A & B • GIS • Competencies Certification of EIA Team Leader
2	Ir. Iswan Dewantara	Biological Sub-team Leader	• Bachelor degree of Forestry • AMDAL A & B • Competencies Certification of EIA Team Leader
3	Eva Aprilia, M.M	Socio-economic Sub-team	• Master degree of Economy • SEIA Constituent • Competencies Certification of EIA Team Leader
4	Afrita Galih Pangestu, SKM	Social and Public Health Sub-team	• Bachelor degree of Public Health • SEIA Constituent • Competencies Certification of EIA Team Member
5	Ir. Darea, M.S	Chemical Physics	• Bachelor degree of agriculture

No.	Name	Position	Expertise
		Sub-team	• Master degree of soil science
6	Rodiman, S.Hut.	Biological sub-team	• Bachelor degree of Forestry • SEIA Constituent • Competencies Certification of EIA Team Member

- **EIA method**

Guidance of environmental impact assessment refer to law no.32 year 2009, government regulation no.27 year 2012, Minister of Environment regulation no.5 year 2012, Minister of Environment regulation no.16 year 2012 dated on 5 October 2012 and other regulations.

EIA study method such as collecting & analyst data, estimation/prediction of impact and evaluation of significant impact.

The data collection process was strongly associated with the type of data to be collected. In general, studies will be conducted based on primary data and secondary data. Primary data are obtained through observation, measurement and field interviews, and secondary data are obtained from the literature collected, either from the company, or directly from related institutions in the study of this area. The methods that were used to collect the data were adjusted with components that can be studied. The used data must be accurate and reliable so that it could be used to analyzed, measure and observe the environmental components which it predicted would be affected and components of action plan that would give significant impacts to the surroundings. The data were collected was as follow :

- Physical – Chemical Components (Climate, Air Quality and Hydrology, and Soil).
- Biological Components (Vegetation, Animals, and Water Biota).
- Socio-Economic Cultural Components (Demography/ Population, Social, Economic, Social and Cultural).
- Environmental Health and Public Health Components (Environmental sanitation, public health level, level of public health services).

Determination of the significant impact to the environment caused by the development activities of the plantation is only intended as an attempt to estimate the large and important environmental quality changes that can be caused by the plantation development activities of PT GMS in Matan Hilir Utara Sub-district, Ketapang District, West Kalimantan Province. The method of significant impact estimation used is by differentiating the magnitude of impact and significance of impacts.

The magnitude of Impact is measured from the changes in the environmental quality. Formal and informal methods are used to estimate changes in environmental quality.

1. Formal Methods
   Formal methods are used to estimate the impact of parameters which the system characteristics can be identified or estimated by using the approach of environmental threshold at national and regional levels.
2. Informal Methods
   Informal method is a method that based on the professional judgment of experts, logical frame analysis and analogy. This method is use to estimate the environmental parameters which characteristics system finds difficult to identify or estimated by modeling approach such as socio-cultural systems.

Assessment of the important impact characteristics were in accordance to BAPEDAL decision Number: KEP-056 of 1994 on Guidelines Regarding Significant Impacts size. Meanwhile, in relation to the impact evaluation conducted by Important Impact scaling into two categories: important and less important. Characteristics Impact divided into two groups, negative impacts and positive impacts. It will be regarded as negative if the changes/ impact estimated is get adverse towards the environmental, and it is positive if the changes/ impact estimated giving beneficial to the environment.

The Important Impact evaluation explore "holistic causative" against expected environmental components that is affected. For this purpose the supporting tools used is interactions matrix. Interactions matrix between activity components and environmental component contain magnitude of Impact and Importance of Impact. This Important Impact evaluation will be conducted careful and with thorough study to the primary impact (positive / negative) and secondary impacts (positive / negative), and also other derivative impacts on the environment component and activities component.

The study on the important source impact and hypothetical impact can identify the key issues that need to be managed. Results of the Important impact evaluation are also expected to assist the decision making process in the selection of a viable alternative plan that takes into consideration of the environmental aspects of the proposed area.

3.3. HCV Assessment

- **Dates assessment were conducted**

The HCV assessment at PT GMS was carried out dated on 6 Oktober 2015 to December 2015 (detail of HCV assessment schedule such as pre-assessment and preparation dated on 6-11 October 2015, opening meeting & basic training on HCV and participatory mapping dated on 13 October 2015, field survey dated on 13-15 October 2015, stakeholder consultation and closing meeting dated on 16 October 2015 and analyst and reporting on pasca-field assessment phase period of October to December 2015) & January to June 2016 (revision of report include of peer review) in the location permit (izin lokasi) & plantation bussiness permit (izin usaha perkebunan) areas of PT GMS. HCV report has evaluated by HCV-RN (ALS quality control) dated on 25 October 2016 with result of evaluatiion status is satisfactory.

- **Assesor and their credentials**

HCV assessment has carried out by a consultant from PT Gagas DinamiGa Aksenta which is located in Jl. Gandaria VIII/10, Kebayoran Baru Sub District, South Jakarta District, DKI Jakarta Province, Indonesia 12130. Phone contact : +62 21 7396518 and email : pupung@aksenta.com dan aksenta@aksenta.com.

The HCV assessor team composition consists of have ALS license and non ALS license as below :

a. **Resit Sözer** (Team leader and RSPO approved HCV lead assesor because he have ALS license (no.ALS15030RS as provisional)). He is scientist and practicy of wildlife for fauna, expertise in taksonomi and ecology of fauna, fauna management, habitat and population assessment and wildlife conflict mitigation. Email address is resit@aksenta.com.

b. **Fersely Getsemani FS** (Team Member) acts as environmental service with expertise in hydrology, soil and water conservation, spatial analysis and remote sensing, also water management system. Email address is getsa@aksenta.com.

c. **Teuku Ade Fachlevi** (Team Member) acts as socio-culture with expertise in social, economic, natural resources management and business planning. Email address is adhe@aksenta.com.

d. **Reza Abdillah** (Team Member) acts as GIS specialist with expertise in Remote sensing, conservation biology and land use issues mapping, and Carbon Stock Assessment. Email address is reza@aksenta.com.

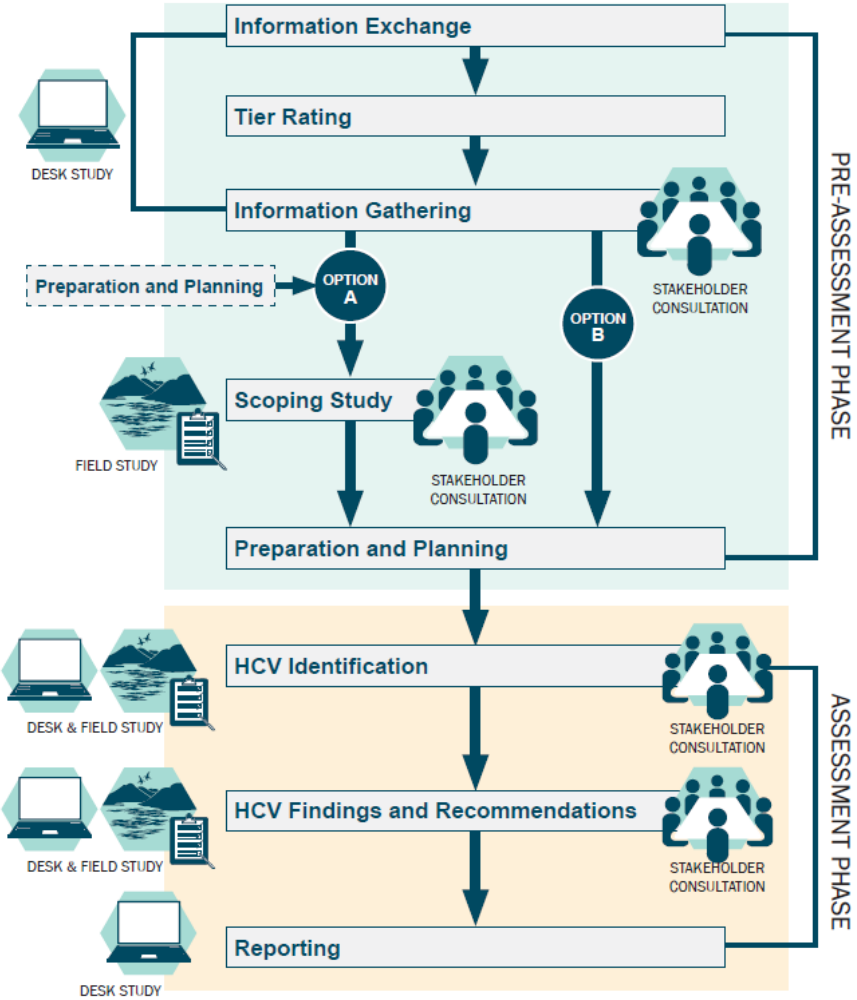
Whereas, peer review of HCV report is Dr Kunkun Jaka Gurmaya with email address is kunjgurmaya@yahoo.co.id. HCV assessment manual (HCV-RN, 2013) has used by Mr Kunkun on review process.

- **Assessment methods**

The high conservation values forest toolkit (ProForest, 2003), guidance of HCV identification in Indonesia, common guidance of the identification of HCV (HCV resource network, 2013) and HCV assessment manual (HCV resource network, 2013) are used for HCV assessment in PT Gemilang Makmur Subur (GMS).

Materials used in the identification and analysis include are : AMDAL document, protected areas master list, IUCN Red List of Threatened Species (www.iucnredlist.org), CITES Appendices I, II and III valid from 12 June 2013 (CITES, 2013), Government Regulation of Indonesia Number 7 1999 (PP 7 1999), A Field Guide to the Birds of Borneo, Sumatra, Java and Bali (MacKinnon & Phillips, 1993), The Mammals of The Indomalayan Region (Corbet & Hill, 1992), A Field Guide to The Snakes of Borneo (Stuebing & Inger, 1999), Panduan Lapangan Mamalia di Kalimantan, Sabah, Sarawak & Brunei Darussalam (Payne et al, 2000), The Ecology of Kalimantan (MacKinnon et al, 1996). Digital elevation model map and data (USGS, 2000), Land cover: Landsat 8 OLI Imagery, land system map (RePProt, 1989), topographical map (Rupa Bumi Indonesia map, BIG 1998)), forest land use map (TGHK) and Map of Jelai-Kendwangan River (KemenPU, 2012).

Step of HCV assessment below :



Flowchart 1. Step of High Conservation Value Assessment

The collection of data and field information focused on potential areas of HCV based on: results of the preliminary study. The emphasis of the collection of data and information aimed at the attribute or element of HCV, using a combination of several methods, namely :

i. The participatory mapping, carried out in an integrated manner to all types of HCV (biodiversity, environmental services and socio-cultural),
ii. Ground truthing, direct check in the field above the land cover interpretation of satellite imagery that has been done at the pre-assessment,
iii. The data field collection, to verify the existence of the attributes or elements of HCV in the potential areas, and
iv. Interview

3.4. Land Use Change Analyst (LUCA)

- **Dates assessment were conducted**

LUCA of PT GMS was carried out dated on 7 Oktober 2015 to 8 Januari 2016 (field visit or survey to field (19 to 22 October 2015) and collecting data was conducted concurrently with HCV Assessment in November 2015). PT GMS has revised LUCA report on January 2017 because referring to the result of review of RaCP.

- **Assesor and their credentials**

LUCA of PT GMS was carried out by a consultant from PT Gagas DinamiGa Aksenta which is located in Jl. Gandaria VIII/10, Kebayoran Baru Sub District, South Jakarta District, DKI Jakarta Province, Indonesia 12130. Phone contact : +62 21 7396518, and email : pupung@aksenta.com dan aksenta@aksenta.com.

The LUCA team composition consists of :

- **Risa Desiana Syarif** as GIS specialist. She is expertise in Land use change analysis, remote sensing, GIS, Forestry, Forest Community, Carbon Stock Estimation, HCV assessment.
- **Andrini Eka Diah** as GIS specialist. She is expertise in GIS, remote sensing, land use change analysis, Meteorology analysis.

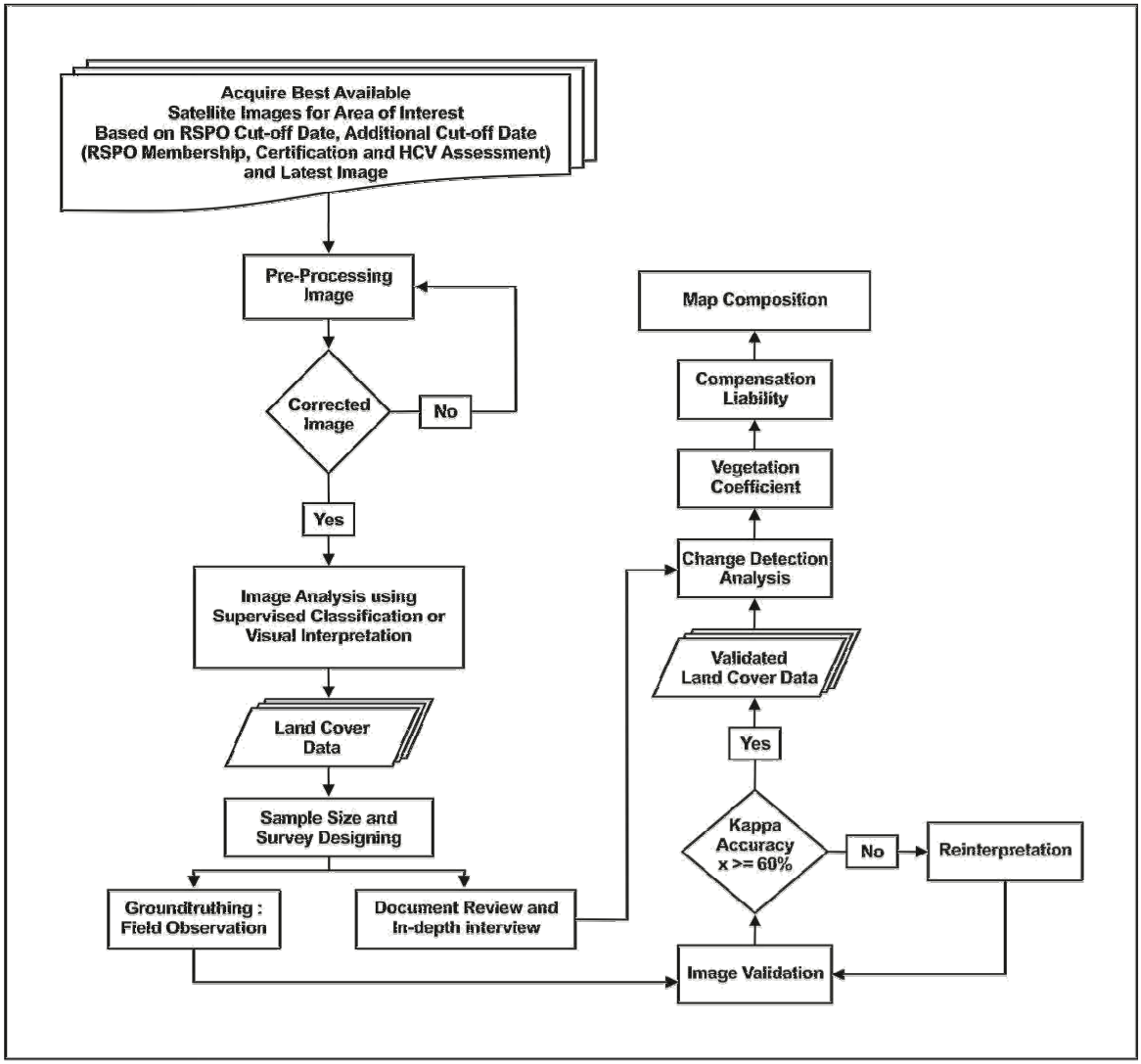
- **Assessment methods**

LUCA analyst method is overlay company map with satelite imagery map period of November 2005 to November 2007, November 2007 to December 2009, January 2010 to May 2014, May 2014 to October 2015 (carry out HCV assessment).

Some satelite imagery which using to cover crop analyst are :

Type of Data	Data used	Data Source
Satelit imagery periode *cut-off* November 2005	• Landsat 5 TM path 121 row 061 date on 13 September 2005 • Landsat 5 TM path 121 row 061 date on 04 Pebruari 2006 • Landsat 5 TM path 121 row 061 date on 09 April 2006	www.glovis.usgs.gov.
Satelit imagery periode *cut-off* November 2007	• Landsat 5 TM path 121 row 061 date on 01 Juli 2007	www.glovis.usgs.gov.
Satelit imagery periode *cut-off* Januari 2010	• Landsat 5 TM path 121 row 061 date on 01 April 2009 • Landsat 5 TM path 121 row 061 date on 07 Agustus 2009 • Landsat 5 TM path 121 row 061 date on 24 September 2009	www.glovis.usgs.gov.
Satelit imagery periode *cut-off* Mei 2014	• Landsat 8 OLI path 121 row 061 date on 17 Mei 2014	www.glovis.usgs.gov.
Satelit imagery aktual (April 2015)	• Landsat 8 OLI path 121 row 061 date on 25 September 2015	www.glovis.usgs.gov.

LUC Analysis was performed by four steps, namely (1) Image Preprocessing, (2) Image Classification, (3) Field Verification, (4) The Compensation Scheme. Refer to the following flowchart 2.



Flowchart 2. Step of Land Use Chage Analysis

3.5. Carbon stock assessment & calculation of GHG emission

- **Dates assessment were conducted**

The carbon stock assessment at PT GMS was carried out in October 2015 (along with the HCV assessment). Whereas, GHG calculation mitigation for new planting was submitted to RSPO secretariat in September 21, 2016.

- **Assesor and their credentials**

The carbon stock assessment by a consultant from PT Gagas DinamiGa Aksenta which is located in Jl. Gandaria VIII/10, Kebayoran Baru Sub District, South Jakarta District, DKI Jakarta Province, Indonesia 12130. Phone contact : +62 21 7396518, and email : pupung@aksenta.com dan aksenta@aksenta.com.

The carbon stock assessment team composition consists of :

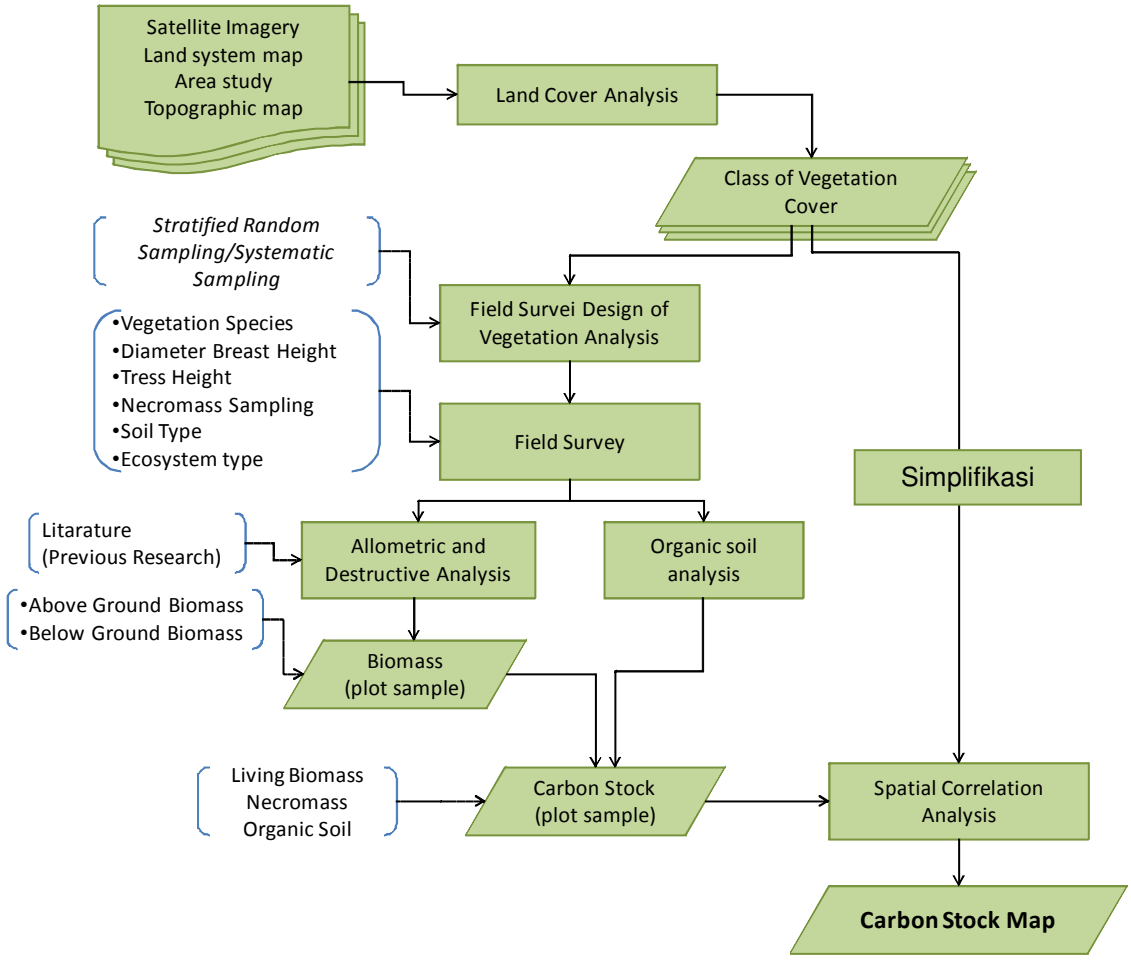
- **Ryan Karida Pratama** where he is expertise in Agroklimat, Soil and water conservation, GIS and Remote Sensing expert.
- **Bias Berlio Pradyatma** where he is expertise in Surveyor, biomass estimation and calculation of standing trees.
- **M. Ahda Agung Arifian** where he is expertise in Surveyor, biomass estimation and calculation of standing trees.
- **Andrini Eka Diah** where she is expertise in GIS, remote sensing, land use change analysis, Meteorology analysis.

Whereas, calculation of GHG emission was carried out by internal team i.e Hidayat Aprilianto, Helga Sitorus, Amir Hamzah & Saeshaputi R.P.

- **Assessment methods**

Before determines the area with High Carbon Stock, there is a needs to carry out the carbon calculations. Its take several steps including land cover analysis which is strengthened with field survey. It is aimed for sampling biomass and land cover verification based on the results of satellite image interpretation (ground thruthing). Thereafter the estimation and mapping carbon stocks is carried out.

The carbon stock assessment in the area of Location Permit of PT GMS is divided into five sections, namely; (i) the initial study (desk study) and preparation, (ii) survey and sampling in the field, (iii) laboratory analysis, (iv) data analysis and mapping, and (v) the preparation of the report, with the following process :



Flowchart 3. Step of Carbon Stock Assessment

The amount and placement of sample plots in the field is determined by the stratified random sampling method representing each land cover class derived from the interpretation of satellite images. Based on land cover classes in PT GMS, specified point measurement plot had as many as 26 points, simplified into three strata consisting of Sf 9 plots, Sc 12 plot, and Bs 5 plots. On each plot, ground truthing field verification was carried, which is the result of the interpretation of satellite images, vegetation inventory using techniques for vegetation level terraced path trees, small trees, saplings, and lower plants (herbs, shrubs, and saplings).

Calculation of carbon stock carried out over all (five) carbon sources, i.e. above surface biomass, below surface biomass, deadwood, litter and soil organic matter. Estimations of tree biomass were done according to allometric equations derived from the predicted research results carbon values that have been implemented and are credible.

The total amount of biomass carbon reserves in the study area was estimated by performing regression analysis against the value of carbon stocks in each plot with the value of shortwave infrared spectral data from Landsat 8 satellite image (band 6). This approach requires a longer process, but will provide a higher level of accuracy than the approach based on each stratum or ecosystem type. Extrapolation was performed on the estimation of the carbon value derived from biomass and necromass. Extrapolating results are then used to map carbon stocks in the study area derived from biomass and necromass.

Using the HCS Approach Toolkit Version 1.0: March 2015 (HCS Approach Steering Group, 2015), the assessment consist of land cover classification, carbon stock estimation, local community FPIC (FGD with community's representatives), and HCS area identification. HCS area identification is occurred according the steps in HCS Patch Analysis Decision Tree (**Flowchart 4**).

To determine the High Carbon Stock area, we take note of the following :

- Land covers of PT GMS area are classified by Carbon Stock information derived from field survey. The land cover classification consist of Degraded Land (0 – 40 TonC/Ha), Young Regeneration Forest (40 – 60 TonC/Ha), Low Density Forest (60 – 80 TonC/Ha), Mid Density Forest (80 – 100 TonC/Ha) and High Density Forest (>100 TonC/Ha).
- HCS identification of Priority Forest Patch is occurred to 6 step. (i) Risk Assessment (step 7), (ii) YRF with >10 Ha identification (step 8), (iii) Pre-RBA (step 9), and (iv) Rapid Biodiversity Assessment (step 10) are the steps needed to determine either the Patch is HCS or not.
- HCV Area and HCV MA acreages used in this assessment is based on GIS acreage (1,273.8 Ha).
- Area identified as Peat Ecosystem is referred to Mendawai Land System Type (peat swamp).
- HCV Area is considered as the indicator of area which needs to be conserved for the pre RBA. Patches connected to HCV Area are also defined to be conserved

Whereas, input all information to software of RSPO Palm GHG calculator (version 2.1.1 which has developed by RSPO) with data used are spatial data map of permit boundaries, HCV area, HCS area, land cover map, soil type map and distribution of carbon stock and secondary data from company such as trend of use of and sources of fertilizer, trend of FFB production, trend of mill extraction rate, trend of empty bunch & shells usage, trend of management of POME.

Baseline information was used by company to input on GHG calculator are :

(i) Planting Cycles

25 years of planting cycles.

(ii) Dosage of fertilisers

- RP 2 kg/year/plant from Egypt
- MOP 2 kg/year/plant from Canada
- Urea 1.5 kg/year/plant from Bontang, East Kalimantan
- Kieserit 1.5 kg/ year/plant from Germany

(iii) Yield

FFB per year: 25 tonnes (average of Bumitama)

(iv) Processing

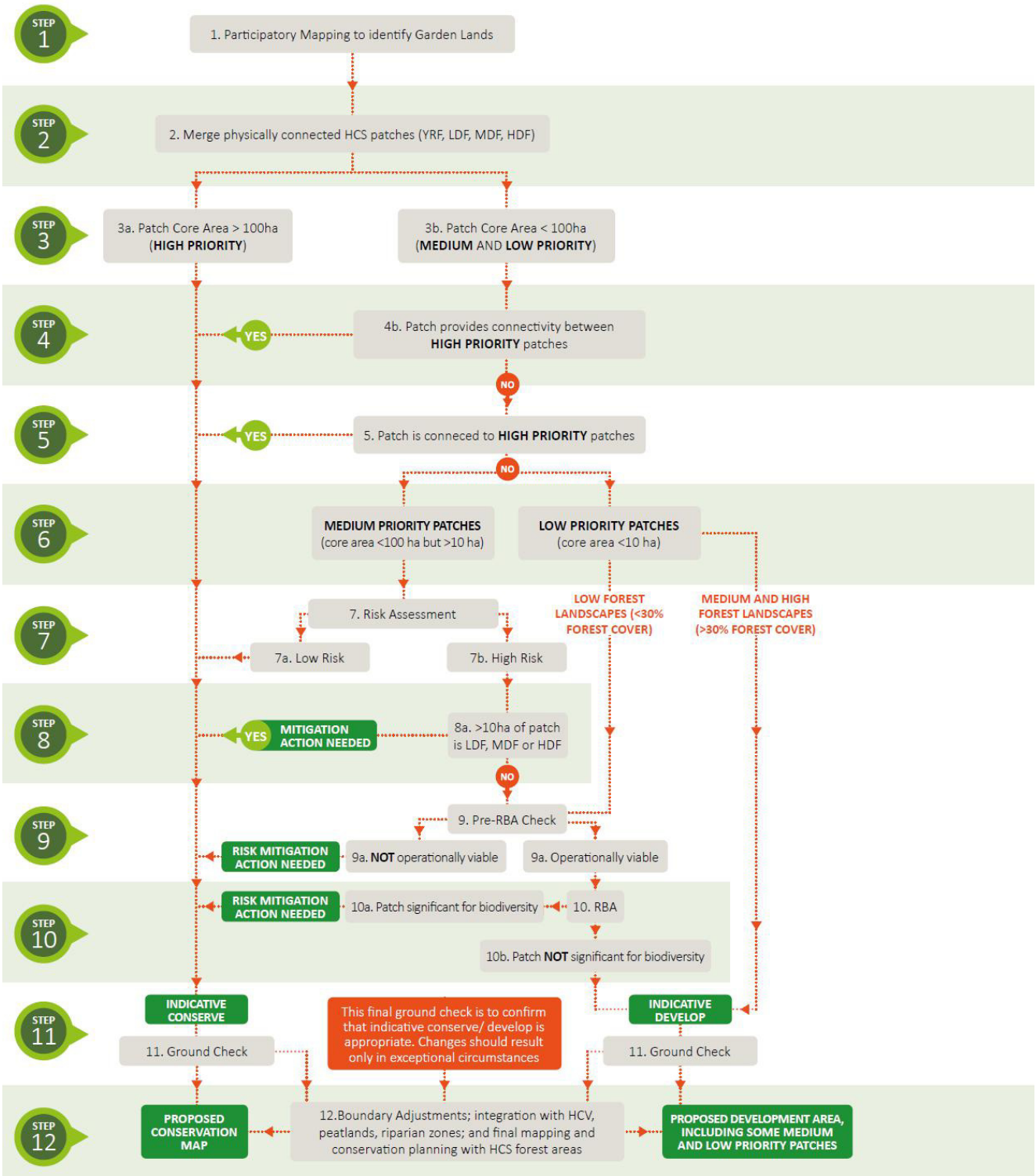
- Extraction CPO 24% (average of Bumitama's Mill)
- Extraction Kernel 5 % (average of Bumitama's Mill)
- Extraction Shell 4 % (2% to be used and 2% for sale)

(v) Peat

- Related to Bumitama's Sustainability Policy since August 2015, GMS is commited to no land clearance on peat area regardless of depth
- Peat areas previously planted will be managed in accordance with the best management practises, keeping the water table of 60 cm. Conservation peat areas will be kept at 0 cm water table.
- Peat locations are in HCV

(vi) HCV and HCS

HCS and HCV areas identified by Aksenta (Consultant approved by HCVRN, endorsed by RSPO). the location was identified as HCV and HCV is overlapped with an area of **1,273.80 ha**



Flowchart 4. HCS patch analysis decision tree

4. Summary of findings

4.1. Social Impact Assessment

Social Impact Assessment of PT GMS, Aksenta takes the data from Nek Doyan Hamlet, Laman Satong Village, Matan Hilir Utara Sub-district. The assessment was also conducted in the nearest hamlet; Sepahan Hamlet, Simpang Tiga Sembelangan Village, Nanga Tayap Sub-district.

Matan Hilir Utara Sub-district has an area 720 km^2 with a population of 15,620 people spread over 19 villages (based on Ketapang Regency Data, 2015). Laman Satong Village is the largest village area in this Sub-district (45.29%), with a population of 2,683 people.

The local people were living around the area PT GMS is multi-ethnic, consisting of Dayak, Malay Javanese, Bugia and Tinghoa (Chinese). The majority of the local people is from Dayak Tolak Sekayuh. Before the people come with the religion in 1990s, local people of Laman Satong adopts the animism, until now local people with animism do the Paguk Besak Ritual or celebration of harvest on a large scale along with funeral pyre. Nowadays, people adopt various religion; Islam, Catholic, Christian, and Buddhist.

Different with people at Laman Satong, people in Sepahan Hamlet, Simpang Tiga Sembelangan Village, Nanga Tayap Sub—district is dominated by Malay Ethnic, with the majority of the religion group is Islam.

The primary livelihood of the local community around PT GMS is as an employee of oil palm plantation. Besides that, they also rely on farming activities, paddy and rubber combined with fruits and palawija. Some people from the Sepahan Hamlet also get income from livestock

The main means of transportation is on land. Village road are such as dirt road that is not coated with asphalt, whereas the provincial cross road is categorized as good road which is paved. People go through the road with motorcycles. Most of people at the Sepahan Hamlet still use the river path, especially to reach the rubber smallholding site. Stalls and small stores that sell a variety of daily needs can be found in the hamlets.

Identified social impact (positive and negative impact) based on Pentagon Assests are :

Company Activities	Human Capital	Social Capital	Financial Capital	Natural Capital	Physical Capital
Communication and social relations	0	0	0	0	0
Licensing	0	0	0	-	0
Smallholder Partnerships	0	-	+	-	0
Recruitment and Labor Management	+	0	+	0	0
Security	0	0	0	0	0
Transportation Management	0	0	+	0	0
Equipment Maintenance	0	0	0	0	0
Land Acquisition	0	-	+	-	0
Land-Clearing	0	-	+	0	0
Infrastructure development	0	0	+	0	0
Nurseries	+	0	+	0	0
Planting and Insertion	+	0	+	0	0
Plant Maintenance	+	0	+	0	0
Harvesting	0	0	0	0	0

Company Activities	Human Capital	Social Capital	Financial Capital	Natural Capital	Physical Capital
FFB Transportation	0	0	+	0	-
Replanting	0	0	0	0	0

Note :
(+) Positive impact
(-) Negative impact
(0) No impact

Socio-economic impacts to country, region and local communities

Specifically, there was no information about social economic impacts to country on SIA's and EIA's document. Document does not explain the effects on the region and the local community, although there are currently actual potential social impact in the form of rejection of Nek Doyan Sub Village communities against the relocation of the smallholder from Tanah Merah Sub village communities in PT GMS at Nek Doyan Sub village administrative area.

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

Before being taken over by Bumitama, the management of PT GMS had once stopped operations of the plantation because of financial concern. This has lead in a loss of income sources for the surrounding communities, because of the cultural life of the river has been absent for a long time; since the trans-Kalimantan road was built through the hamlet Nek Doyan and connected the other hamlets around PT GMS.

With the takeover and starting back in the operational GMS by Bumitama, the local communities, especially the community of Nek Doyan Hamlet could resume work in PT GMS and/ or was provided other business opportunities.

Social impact regarding company's employee and emplasment/housing in estate and the impact to local communities. Employees and housing in estate has been clear since they joined the company directly affected by the company's existence. It is definitely an asset pentagon them unchanged when compared to the state before joined and after joining the company. Social impact seen from how companies can increase or reduce natural capital, human capital, social capital, financial capital and infrastructure capital owned socially. Thus it can be concluded that when a person is working in the company, then he automatically have a positive impact on the company's presence. The impact not only on him, but also occur in families with dependents.

Issues raised by stakeholders and assessors comments

A. Social issues regarding to employees is primarily concerned with the challenges of implementation efficiency of labor discipline and clarity of the status of employees. While internal social risks encountered is inequality of employment status.

B. Social issues related to palm oil company activities on surrounding communities i.e:
   - Communication and social relations ; Emerged discontent among members of the cooperative, lack of credibility of the company will disrupt the company operation of the
   - Recruitment and Labor Management ; The opening of new areas further encourage employee recruitment opportunities.
   - Infrastructure development : Contractors have not been paid for work already completed.
   - Land Acquisition ; There are land claims that have been released, because the issue of restitution of land which has not been implemented, Unclear boundaries of community land
   - Land-Clearing ; Fire from burning activities for the community's agricultural land can propagate into the plantation areas.
   - Harvesting ; FFB stealing

- FFB Transportation ; Communities want to be involved in the FFB transportation

4.2. Environmental Impact Assessment

EIA or AMDAL document consist of the refer of framework for analysis of environment impact (KA-ANDAL - *Kerangka Acuan Analisis Dampak Lingkungan Hidup*), analysis of environment impact (ANDAL - *Analisis Dampak Lingkungan*) and management and monitoring of environment (RKL-RPL - *Rencana Pengelolaan dan Rencana Pemantauan Lingkungan Hidup*). Scope of EIA document is develop of plantation and palm oil mill on total of areas ± 5,190 ha and mill capacity is 45 tonnes/hour (location permit no.272/PEM/TAHUN 2015).

The company have environment permit from Local Government of Ketapang District (Head of Ketapang District decree no.743/KLH-B/2015 dated on 3 November 2015) with scope of study was cover development of palm oil plantation of ± 5,190 ha and palm oil mill with production capacity of 45 ton FFB per hour. The company has been showed to auditor team regarding approval for KA-ANDAL, ANDAL and RKL/RPL from local government in form of Head of Ketapang decree no.716/KLH-B/2015 dated on 28 October 2015 (regarding environment feasibility).

The document was cover all phase of development palm oil plantation and palm oil mill, starting from pre-construction phase, construction phase, operational phase and pasca-operational phase. The result of evaluation of significant impact are :

- Decrease of air quality and increase of noise in construction & operation phase (significant)
- Decrease of water surface quality in construction phase (significant)
- Land subsidence in construction phase (significant)
- Change of fisiografi in construction phase (significant)
- Change of drainage pattern in construction phase (significant)
- Potential of forest fire, land and plantation in construction phase (significant)
- Decrease of biodiversity (flora and fauna) in construction phase (significant)
- Increase of economic activity in construction & operational phase (significant)
- Income of community in construction & operational phase (significant)
- People's behavior patterns in pre-construction, construction & operational phase (significant)
- Perception & attitude of community in pre-construction phase (not significant)
- Social conflict in construction phase (significant)
- Level of health community in construction phase (significant) and operational phase (not significant)

AMDAL or EIA document were technical reviewed dated on 7 August 2015 for KA-ANDAL report and 11 September 2015 for ANDAL report which participated by some parties such as Head of TKD in Matan Hilir Utara Sub District, Plantation Agency at Ketapang District, Forest Agency at West Kalimantan Province, Evinronment Agency at Ketapang District, Health Agency at West Kalimantan Province, Transportation, Communication and Information Agency at West Kalimantan Province, Local Government Secretariat at West Kalimantan Province, Plantation Agency at West Kalimantan Province, Local Development Planning Agency at Ketapang District, University of Tanjungpura, Mining company (PT Laman Mining), head of Laman Satong Sub District, community from Laman Satong village, Public work at Ketapang District, Labor and Transmigration Agency at West Kalimantan Province, Forest Areas Agency at West Kalimantan Province, Military. The result of technical review has included/stated on KA-ANDAL and ANDAL report.

The record of stakeholder consultation with relevant parties was available on EIA report example announcement on Tribun Pontianak newspaper date on 5 August 2015 and minute of exspose regarding develop of oil palm plantation date on 5 June 2014, etc so that there are evidences that develop of EIA report involving communities and other parties which give impact.

Some issues raised by stakeholders on technical review for ANDAL report i.e PT GMS overlap with PT Laman Mining areas, socialization of develop of oil palm plantation has carried out in Matan Hilir Utara Sub District but on Laman Sotong Sub District yet, Laman Satong village community hope PT GMS concern to conservation or rehabilitation, employee from local community, partnership programme, etc.

The RKL-RPL documents has developed according to the relevant regulations and content the following :

RKL (Environment management plan)
- Environment impact which managed
- Impact source
- Indicator of success on environment management
- Activities on environment management
- Location of environment management
- Institution of environment management

RPL (Environment monitoring plan)
- Identified significant environmental impact;
- Identified impact resources (activities);
- Parameters;
- Collecting data and impact analyst method;
- Location/areas;
- Timetable and/or frequency of monitoring;
- Institution of environment management (Person in charge to monitor environmental impact, supervisor and receipt report);

4.3. HCV Assessment

Lead assessor of HCV assessment PT GMS has lisenced assessor (ALS15030RS) and HCV report has appropriated with ALS template for HCV public summary report and has evaluated by HCV-RN (ALS quality control system) with satisfactory status.

The identification and analysis of HCV was carried out in the area PT GMS in Matan Hilir Utara sub-district, Ketapang District, West Kalimantan Province. Assessment covered of 5,190 ha in accordance with the location permit. Based on HCV report that oil plam planted areas period of year 2005 to 2008 is **2,833 ha** where it still managed by PT GYP. Until November 2015 that oil palm planted areas is **3,110 ha**.

Stakeholder consultation has carried out dated on 16 October 2015 with participant from community in Nek Doyan Sub Village, employees, company neighbor (PT KAL, PT Laman Mining), Head of Sub District, Military at Matan Hilir Utara Sub District, Head of traditional customary and NGO (YIARI, FFI, ASRI, Yayasan Gunung Palung). Presentation of HCV stakeholder consultation was available where it has explained the result of document verification and field survey so that participant can provide feedback to HCV team. The content of presentation on stakeholder consultation are goal of meeting, profil of company & HCV assessment team, reference of HCV assessment, about of HCV, scope of HCV assessment include of map, status of areas map, moratorium map, cover crop map, field survey map, category of HCV, key and distribution species, the result of field survey and HCV assessment include of map of indicative HCV areas.

Based on attendand list of participatory mapping dated on 13 October 2015 that there is not participant from community because participant from company's employee only. Moreover, PT GMS has carried out consultation public dated on October 16, 2015 with participant from NGO and local community. The LUCA report separate with HCV report. Moreover, PT GMS has carried out additional stakeholder consultation dated on 17 November 2015 at Shangrila Lobby Lounge, Kuala Lumpur with participated by Aidenvironment, International Animal Rescue, Fauna & Flora Intrnational, Bumitama Agri Ltd and Aksenta. Topic of stakeholder consultation is conectivity between forest areas in Putri river (*Sungai Putri*), Palung montain (*Gunung Palung*) and Tarak montain (*Gunung Tarak*) as *Orangutan* coridor.

During assessment, based on interview with community that one person (Mr Beng Slamet) does not know his areas inside indicative of HCV areas or coridor areas. Whereas the other informants, they have understood indicative of HCV areas or coridor areas. Based on condition it that the company has not been identified customary right by person on HCV areas or coridor areas and evidence of compensation land for indicative HCV areas or corridor areas.

The HCV assessor has adequate justified & supported by evidence in order to all decisions on HCV presence or absence. Type of HCV has identified on PT GMS areas is all type of HCV except HCV 2 because there is not core areas and buffer areas as landscape which important. Moreover, ecotone not available or natural transistion between two ecosystem not available or area have population from representative of natural species not available because PT GMS have not natural land cover.

Study of flora in the context of HCV identification is carried out using the types of ecosystems that exist in the area of PT GMS, and the types of ecosystems that exist around. It is based on the consideration that the natural flora species does not grow individually with the specific needs of a growing, but the formation of forest stands dominated by the formation of certain species.

7 (seven) unique species of flora was found in PT GMS, but no species with IUCN Red List Vulnerable, Endangered or Critical Endangered status. 2 Species are CITES Appendix II and 4 species are protected by Constitution No 5 year 1990, Governmental Regulation No 9 year 1999 or Decree of Minister of Agriculture No 54/Kpts/Um/2/1972. As the detail below :

Table 2 : Key Species of Flora at PT GMS

No	Scientific Name	Indonesian Name	Status			
			Endemic	IUCN	CITES	Indonesian Law
1	*Nepenthes ampullaria*	Kantong Semar Periuk	-	-	App. II	AB
2	*Nepenthes gracilis*	Kantong Semar	-	-	App. II	AB
3	Cratoxylon arborescens	Garunggang	-	-	-	-
4	*Palaquium leiocarpum*	Nyatoh	-	-	-	D^1
5	*Alstonia scholaris*	Pulai	-	-	-	-
6	*Eusideroxylon zwageri*	Ulin	-	-	-	D^2
7	*Shorea javanica*	Meranti Putih, *Arau*	-	-	-	-
Total			**0**	**0**	**2**	**4**

Source: Field Survey by Aksenta, October 2015

Note: E = Endemic to Borneo; IUCN (2014): CR = Critically Endangered, EN = Endangered, VU = Vulnerable; CITES: App. I = CITES Appendix I, App. II = CITES Appendix II; Indonesian Law: A = Law No. 5 year 1990, B = Governmental Regulation No. 7 year 1999; D = Protected by Decree of Minister of Agriculture No. 54/Kpts/Um/2/1972 dated on 5 February 1972, D^1 = protected for diameter up to 30 cm DBH (diameter at breast height), D^2 = protected for diameter up to 60 cm DBH

There are 101 species for fauna such as 21 species for mammal, 14 species for reptile, 2 species for amphibian and 64 species for bird. The number of species and the status of wildlife detected in PT GMS areas below :

Table 3 : The number of species and the status of wildlife detected in the PT GMS

Class	Amount	Endemic	IUCN			CITES		Protected by Indomesian Law
			CR	EN	VU	App.I	App.II	
Mammals	21	4	-	2	6	4	7	12
Reptiles	14	-	-	1	2	1	7	2
Amphibia	2	-	-	-	-	-	-	-
Aves (Birds)	64	2	-	-	-	-	10	13
Total	**101**	**6**	**0**	**3**	**8**	**5**	**24**	**27**

Source: Filed Survey by Aksenta, October 2015

Whereas, mammals, reptiles, aves species found in the PT GMS areas and beyond including to endemic species the IUCN Red List, CITES Appendix or protected below :

Table 4 : Mammals species found in the area of PT GMS and beyond, including to endemic species, the IUCN Red List, CITES Appendix, or Protected

No.	Scientific Name	Indonesian Name	Status			
			IUCN	Endemic	CITES	Protected by Indonesian Law
1	*Pongo pygmaeus*	Orangutan	EN	E	App I	AB
2	*Hylobates agilis*	Owa Ungko	EN	E	App I	AB
3	*Presbytis rubicunda*	Lutung Merah			App II	AB
4	*Presbytis frontata*	Lutung Jirangan	VU		App II	AB
5	*Macaca nemestrina*	Beruk	VU		App II	
6	*Macaca fascicularis*	Kera Ekor-panjang			App II	
7	*Nycticebus menagensis*	Kukang	VU	E	App I	AB
8	*Tarsius bancanus*	Krabuku Ingkat	VU		App II	AB
9	*Helarctos malayanus*	Beruang	VU		App I	AB
10	*Prionailurus bengalensis*	Kucing Hutan			App II	AB
11	*Sus b. barbatus*	Babi Jenggot		E		
12	*Cervus unicolor*	Rusa				AB
13	*Tupaia glis*	Tupai Akar			App II	
14	*Hystrix brachyura*	Landak Raya				AB

Source: Field Survey by Aksenta, October 2015

Note: E = Endemic to Borneo; IUCN (2014): CR = Critically Endangered, EN = Endangered, VU = Vulnerable; CITES: App. I = CITES Appendix I, App. II = CITES Appendix II; Indonesian Law: A = Law No. 5 year 1990, B = Governmental Regulation No. 7 year 1999.

Table 5 : Reptiles species was found in the area of PT GMS and beyond, including to endemic species, IUCN Red List, CITES Appendix or Protected

No.	Scientific Name	Indonesian Name	Status			
			IUCN	Endemic	CITES	Protected by Indonesian Law
1	*Crocodylus porosus*	Buaya Muara (Buaya Badas)	-		App II	AB
2	*Tomistoma schlegelii*	Buaya Sinyulong (*Buaya Sa'ai*)	EN		App I	AB
3	*Varanus salvator*	Biawak Air	-		App II	-
4	*Python reticulatus*	Ular Sanca-kembang			App II	
5	*Naja sumatrana*	Ular-sendok Sumatra			App II	
6	*Ophiophagus hannah*	King Kobra			App II	
7	*Cuora amboinensis*	Kura-kura Ambon	VU		App II	-
8	*Siebrenkociella crassicolis*	Kura-kura Pipi-putih	VU		App II	-

Source: Field Survey by Aksenta, October 2015

Note: E = Endemic to Borneo; IUCN (2014): CR = Critically Endangered, EN = Endangered, VU = Vulnerable; CITES: App. I = CITES Appendix I, App. II = CITES Appendix II; Indonesian Law: A = Law No. 5 year 1990, B = Governmental Regulation No. 7 year 1999

Table 6 : Aves species was found in the area of PT GMS and beyond, including to endemic species, IUCN Red List, CITES Appendix and/or protected by Indonesian Law

No.	Scientific Name	Indonesian Name	Status			
			IUCN	Endemic	CITES	Protected by Lindonesian Law
1	*Egretta garzetta*	Kuntul Kecil				AB
2	*Bubulcus ibis*	Kuntul Kerbau				AB
3	*Elanus caeruleus*	Alap-alap Tikus			App II	AB
4	*Nisaetus cirrhatus*	Elang Brontok			App II	AB
5	*Spilornis cheela*	Elang-ular Bido			App II	AB
6	*Argusianus argus (grayi)*	Kuau Raja		E	App II	AB
7	*Loriculus galgulus*	Serindit Melayu			App II	
8	*Psittacula longicauda*	Betet Ekor-panjang			App II	
9	*Anthracoceros malayanus*	Kangkareng Hitam			App II	AB
10	*Buceros rhinoceros*	Rangkong Badak			App II	AB
11	*Anorrhinus galeritus*	Enggang Klihingan			App II	AB
12	*Rhipidura javanica*	Kipasan Belang				AB
13	*Anthreptes simplex*	Burungmadu Polos				AB
14	*Arachnothera longirostra*	Pijantung Kecil				AB
15	*Arachnothera flavigaster*	Pijantung Tasmak				AB
16	*Gracula religiosa*	Tiong Emas, Burung Beo			App II	
17	*Lonchura fuscans*	Bondol Kalimantan		E		

Source: Field Survey by Aksenta, October 2015

Note: E = Endemic to Borneo; IUCN (2014): CR = Critically Endangered, EN = Endangered, VU = Vulnerable; CITES: App. I = CITES Appendix I, App. II = CITES Appendix II; Indonesian Law: A = Law No. 5 year 1990, B = Governmental Regulation No. 7 year 1999.

There are areas that have a high potential for soil erosion, namely Rungau Hill and the hills in the northern part of the PT GMS area which has a slope of> 40%.

Table 7: River conditions and sub-basins width in the area of PT GMS

No	Name of River	Wide (m)*	Long streams in the area of GMS (km)**	Wter Quality (physic)*	Continuity Flow	Total Area of Sub-basins (ha)**	The area of PT GMS by sub-basins boundaries	
							ha**	%
1.	Tolak (hulu)	15-20	3,5	Moderate	Throughout the year	11.754	623	12
2.	Pelaik Hitam	1,5-2	4,2	Good	Throughout the year	5.976	590	11
3.	Raya	4-5	13,8	Good	Throughout the year	3.179	1.921	37
4.	Selinsing	5-6	17,9	Good	Fluctuative; dried in the dry season	8.866	2.082	40

Based on field observation and review on existing maps show that the area of High Conservation Value Area (HCVA) in PT GMS is 1,273.8 hectares, with details in **Table 8** and **figure 6**.

Table 8 : Identification and Analysis Results of HCV & HCV Management Area in the Concession Area of PT GMS, West Kalimantan Province

No	No Indeks	Description	Type of HCV	Width (Ha)
1.	1A	Plaik Hitam River, wide: 2 m, flows throughout the year. The upstream of ther river at Gunung Tarak Protected Forest and the downstrean at Tolak River. Natural vegetation has opened along the river. Serve as source of water, part of flood control and erosion control. The water is used as a water source to emplacement at PT GMS. The biggest threats to the river is polluted due to agrochemical usage from oil palm plantation.	4.1; 4.2	15.80
2.	1B	Plaik Hitam River, wide: 2 m, flows throughout the year. Serve as source of water, part of flood control and erosion control. The water is used as a water source to emplacement at PT GMS. The biggest threats to the river is polluted due to agrochemical usage from oil palm plantation, so it is necesarry to manage the use of fertilizers.	HCVMA	6.90
3.	2	Peat swamp area which has land cover degradation thickets vegetation, in south of Nursery area II. Has a function as a habitat for several rare, endangered and endemic species. Ecosystem type: peat swamp forest, with a depth of peat (measurable) 0.5 to 1.5 meters which	1.2; 1.3; 1.4; 3; 4.1	71.10

No	No Indeks	Description	Type of HCV	Width (Ha)
		serves as a water catchment area and flood control. This area is used as a water source for nursery area II. The biggest threat to this area is the drainage without water management can reduce groundwater levels in peat; land and forest fires; also commercial timber extraction.		
4.	3	Tolak River, wide: 15-20 m, flows throughout the year. The river upstream at Gunung Palung National Park and downstream into the sea. Mostly riparian area has a naturally vegetation, except in the southwestern of location PT GMS has been lost due to forest fires. Secondary forest and thickets next to the river serve as a habitat for several rare, endangered and endemic species. Ecosystem type is a peat swamp forest in south, and swamp forest in the midle. The river serve as water source, flood control and erosion control. The water is used for nursery area at PT GMS. The biggest threat is land and forest fire, also commercial timber extraction	1.2; 1.3; 1.4; 4.1; 4.2	63.80
5.	4A	Raya River, wide: 4-5 m, flows throughout the year. The river upstream at Gunung Tarak Protected Forest and downstream into Tolak River. Natural vegetation has opened along the river, except in the west of location PT GMS. Serve as water source, flood control and erosion control. The water is used for emplacement at PT GMS and for nursery area I. The biggest threat is pullted due to agrochemicals usage for oil palm plantation	4.1; 4.2	39.40
6.	4B	Area around riparian of Raya River, with natural vegetation has opened along the river, except in the west of the location PT GMS. The biggest threat is pullted due to agrochemicals usage for oil palm plantation.	HCVMA	35.90
7.	5	Rungau Hill, land cover thickets to secondary forest. Serve as a habitat for several rare, endangered and endemic species, as well as water catchment area and erosion control. In the fruits season, people take of the fruits that grown on this hills. Rungau Hill is considered sacred by the indigenous people, because there is pedukuhan and ancestral graves. On the foothills, there are several farmland owned by 3 people of Nek Doyan Hamlet. The biggest threat of this hill is land and forest fires, commercial timber extraction and farming in the sacred area.	1.2; 1.3' 1.4' 4.1' 4.2' 5; 6	38.90
8.	6A	Selinsing River, wide: 5-6 m, dried on dry season. The river upstream at Gunung Tarak Protected Forest and downstream into the Tolak River. Natural vegetation has opened along the river, except in the west of location PT GMS. Serve as flood and erosion control. The biggest threat to this river is polluted by agrochemicals due to oil palm operational.	4.1; 4.2	64.50

No	No Indeks	Description	Type of HCV	Width (Ha)
9.	6B	Area around riparian of Selinsing River, with natural vegetation has opened along the river, except in the west of location PT GMS. The biggest threat to this river is polluted by agrochemicals due to oil palm operational.	HCVMA	22.30
10.	7A	Secondary Forest and thickets area in the west and north of PT GMS. This area is passed by Tolak, Selinsing and Raya River. Serve as a habitat for several rare, endangered and endemic species. The southern part consists of Peat Swamp Forest ecosystems with shallow peat substrate, in the middle of Freshwater swamp forest ecosystem, and the northern part of the dry land forests. This area also has a function as a water source, erosion control, and the hill in the northeastern part serves as a water catchment area. This hill is considered sacred by indigenous people, because there are pedukuhan and ancestral graves. The biggest threat of this area is land and forest fires, commercial timber extraction and farming in the sacred area.	1.2; 1.3; 1.4; 3; 4.2; 4.3	515.50
11.	7B	Secondary forest and thickets area have been burned, which located at the western and northern area of PT GMS	HCVMA	360.30
12.	8	Natai Tumbang Limat with land cover thicket to secondary forest, where there are many fruit plants (agroforestry). This area serve as a habitat for several rare, endangered and endemic species. The area that provides fruits for local people who used communally. The biggest threat of this area is land and forest fires, commercial timber extraction and farmland on the sacred place.	1.2; 1.3; 1.4; 5	6.20
13.	9	Butak Hill or Kecurup Hill, with land cover thicket to secondary forest, steep slopes (> 40%). This area is a water catchment area and erosion control area. It is a sacred placed that is believed by Nek Doyan people, as Pedukuhan Anak Patih Prabu Jawa.	1.2; 1.3; 1.4; 4.1; 4.2; 6	33.20
Indicative total HCV Area (Ha)				**1,273.80**
Area of assessment (Ha)				**5,190.00**
Percentage of HCV Area (%)				**24.50**

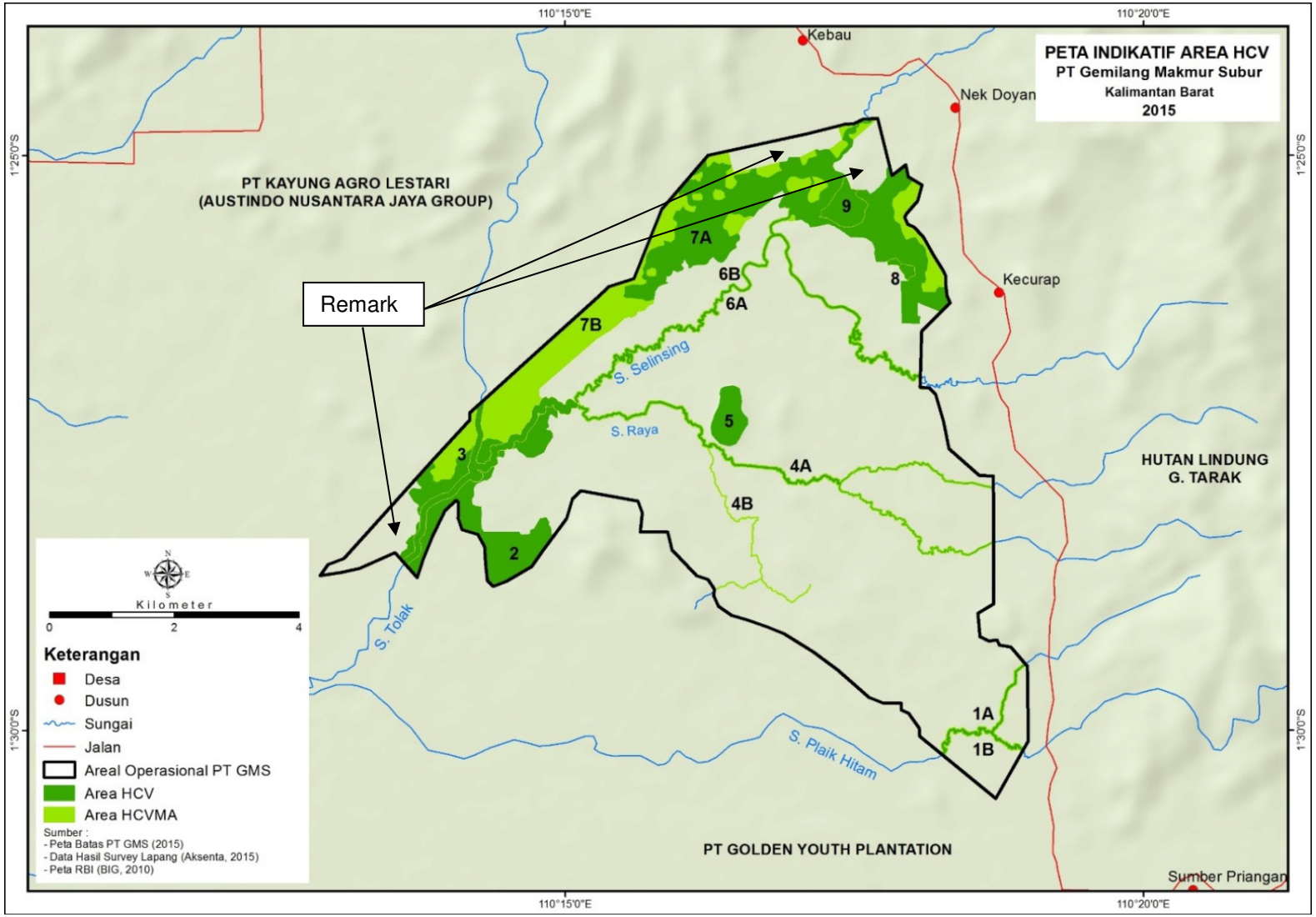


Figure 6. HCV & HCV Management Areas in PT GMS areas

HCV and HCV management areas map in PT GMS areas has stated on **Figure 6**. There are 3 (three) section (has stated with "remark" note on figure) not include of HCV areas but based on **figure 3** that the company has planned as conservation areas for section it.

The result of field verification during assessment are :

- There are not agreement between company with community regarding safeguard for HCV areas with index no.5 (Rungau hill). Moreover, no signboard or other signs that it is HCV areas.
- Selinsing river (index no.6A) no signboard or other signs that that is HCV areas but condition still maintain.
- Block D14-D15 areas (near Selinsing river) has compensation payment to community and company has land clearing, some seedling has planted and other seedlings had available on block D14-D15 to be ready to planting and is flooding. Block D14-D15 is one of NPP areas which has provided by company. Coordinate of block D14-D15 is 01^0 26' 24.7" S; 110^0 16' 09.3" E.
- Tolak river (index no.3) no signboard or other signs that that is HCV areas but condition still maintain. Tolak river was used by employee or community as water source, washing and bathing. Coordinate of Tolak river is 01^0 27' 33.3" S; 110^0 14' 32.1" E). Near Tolak river is nursery and palm oil plantation.

Agreement between company with community regarding safeguard for HCV areas and signboard has covered on summary of management plan below.

4.4. Soil and topography

In the concession of PT GMS, almost the entire of physiographic forms of land at the location is undulating terrain (98%) with land system Honja (HJA), while the rest of the area is shallow peat swamp with land system Mendawai (MDW), RePPProt 1990. Based on the soil type, the plains area is dominated by dystrudeps (order Inceptisol) and haplohumods (order spodosol), while the soil type in the area of peat swamp is haplosaprists (order histosol). Of the three types of land, areas with soil type haplohumods have a highest soil erodibility value, and thus susceptible to erosion. The soil type analyst was carried out in laboratory and the result of soil profile description on field year 2014 (refer to EIA document). Soil map has stated on **Figure 7**. The location of planting plan that the soil type is inceptisol. The histosol area (peatland) will be managed and conserved according to Bumitama sustainability policy. Based on slope map (**Figure 8**) that PT GMS areas dominant is flat (< 8%).

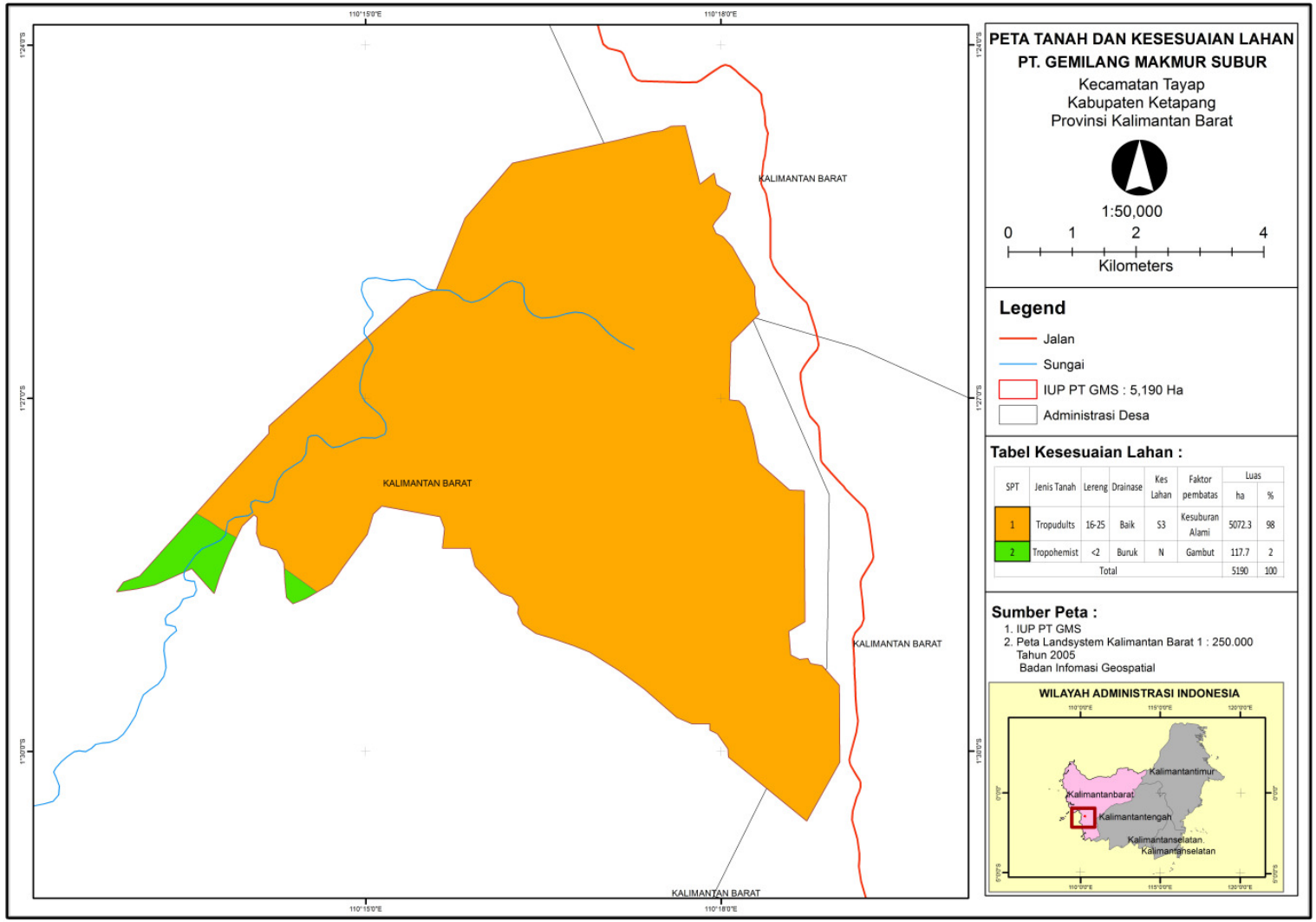


Figure 7. Soil type map of PT GMS

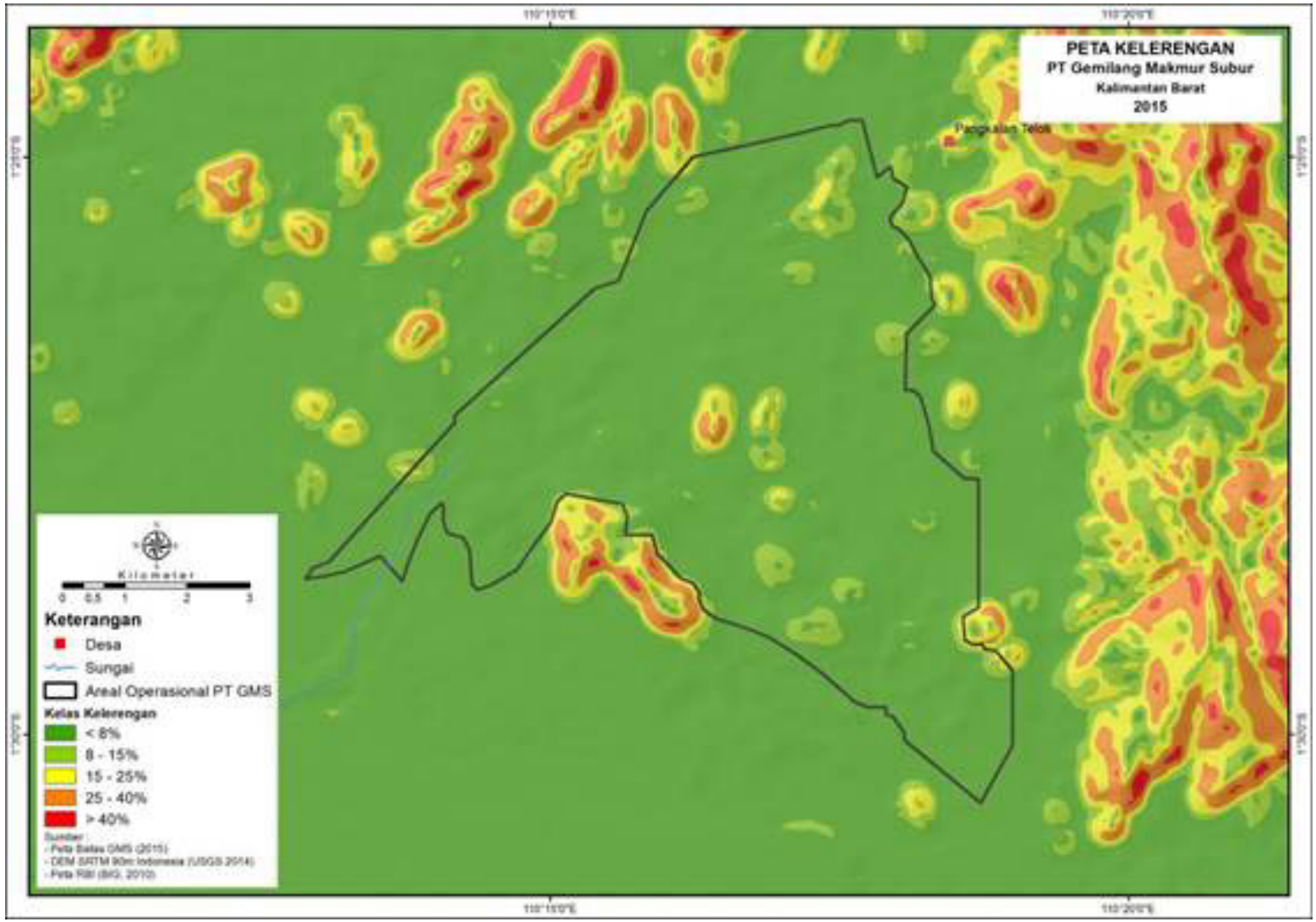


Figure 8. Slope map of PT GMS

4.5. Summary of carbon stock assessment and GHG emissions

- **Summary of carbon stock assessment**

Initial studies focused on the land cover analysis, using the Landsat 8 OLI satellite imagery with the acquisition date of October 20, 2015, to determine the stratification of the vegetation cover (**figure 9**). Land cover classification, as the basis for determining the number and the placement of sample plots at the preparation stage, as well as the extrapolated value of carbon stock at the analysis stage, refers to the classification of land cover SNI 7645 (National Standardization Agency, 2010), carried out through the interpretation of satellite imagery band 654 and band 653 with unsupervised classification method.

Table 9. Results of the interpretation of satellite data prior to ground truthing

Land cover	Area**	
	(ha)	(%)
Secondary Forest	549.6	11%
Old Shrub *(belukar)*	223.2	4%
Shrub *(semak belukar)*	443.0	8%
Scrub *(semak)****	783.1	6%
Oil Palm	3,217.6	62%
Total	**5,216.5**	**100%**

Note :

**) Source : the interpretation of Landsat 8 satellite image data OLI TIRS 20 October 2015 that have been verified in the field in Oktober2015.*

***) Are based on comprehensive GIS (PT GMS boundary shp)*

****) Scrub (semak) consist of bushes, weeds & open land*

Amount of biomass results scaled up according to the land cover below :

Land cover	Areas (ha)	Biomass *)		Average per areas (ton/ha)
		(kilo ton)	(%)	
Secondary Forest	549.6	80.5	52%	146.5
Old Shrub	223.2	26.1	17%	117.0
Shrub	443.0	33.8	22%	76.2
Schrub **	783.1	15.8	10%	20.2
Oil Palm	3,217.6	-	-	-
Total/Rata-rata	**5,216.5**	**156.2**	**100%**	**78.1**

Note :

***)** *Biomass total-sum of Above and Below-ground biomass*

***) Schrub consists of bushes, weeds, and open land*

Source of carbon (carbon pool) in the land consists of, the Above Ground Biomass (AGB), Below Ground Biomass (BGB), necromass dead wood (woody debris), litters and soil carbon (IPCC, 2006; RSPO, 2014). Biomass carbon stocks of PT GMS are calculated based on the scaled up AGB and BGB. In this assessment, the carbon stocks are classified into three classes (HCS, 2015):

- BC1: Reserve carbon biomass <35 ton-C / ha
- BC2: Reserve carbon biomass 35-75 tons-C / ha
- BC3: Reserve carbon biomass > 75 ton-C / ha

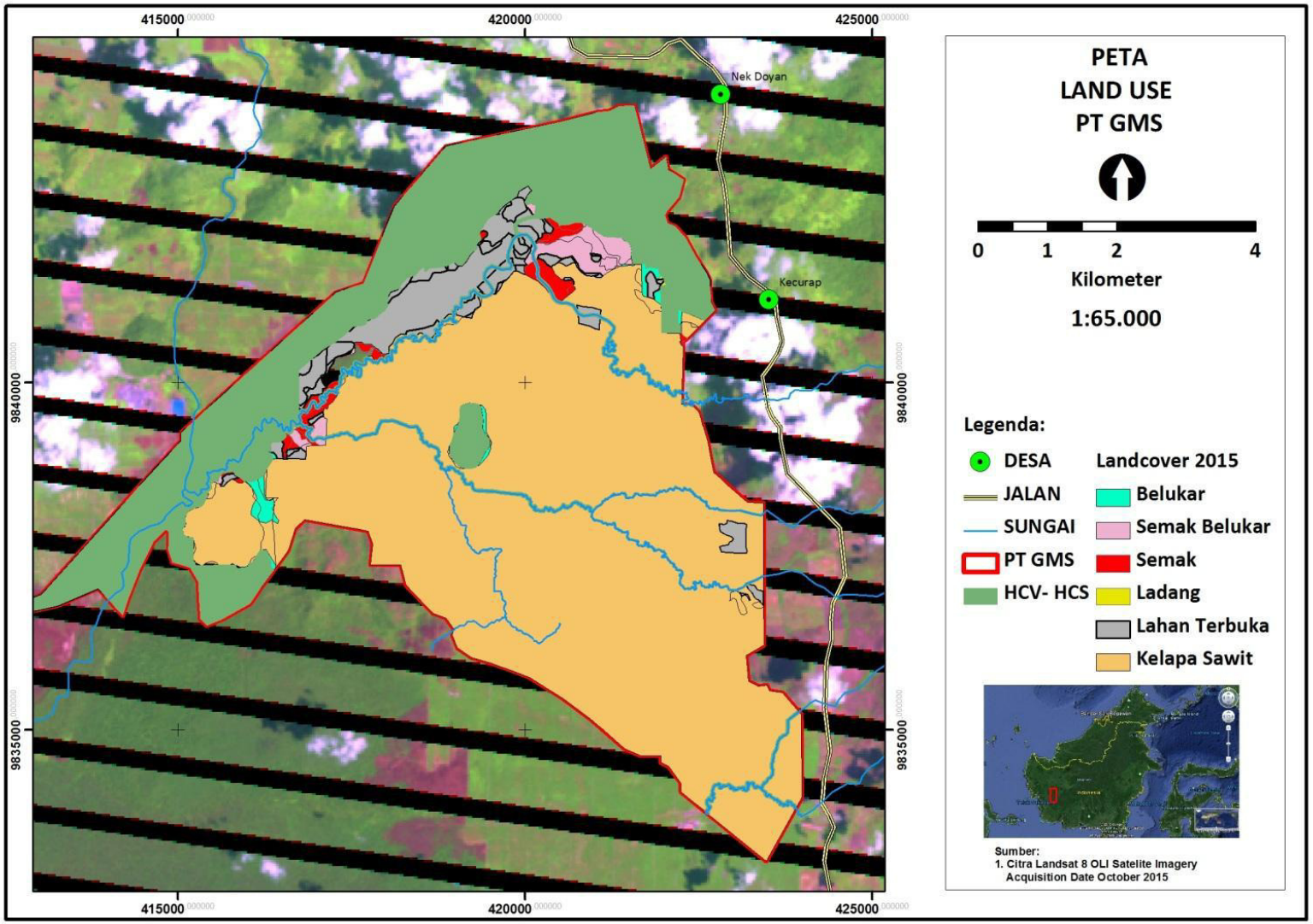


Figure 9. Land use map of PT GMS

The total amount of biomass carbon stocks besides oil palm is **73.40** kilotonnes-C with an average unit area of 36.70 ton-C / ha. Bushes provides the biggest biomass carbon stock by 10% of the biomass carbon. This is because the bushes have a large area even if the average carbon per unit area is only 9.50 tons C / ha. Land cover of secondary forest provides biomass carbon stocks of 51%. Thickets and shrubs provide biomass carbon stock of 17% and 22% respectively.

Table 10. Biomass carbon stock based on land cover on PT GMS, 2015

Land Cover	*Carbon Stock Biomass* (kilo ton- C)				Area (ha)	Average (ton-C/ha)
	BC-1	BC-2	BC-3	Total		
Secondary Forest	-	9.3	28.5	37.8	549.6	68.9
Old Shrub	0.5	7.0	4.8	12.3	223.2	55.0
Shrub	7.9	6.6	1.3	15.9	443.0	35.8
Scrub	7.4	-	-	7.4	783.1	9.5
Oil Palm	-	-	-	-	3,217.6	-
Grand Total	**15.8**	**23.0**	**34.7**	**73.4**	**5,216.5**	**36.7**

*) BC-1 : < 35 ton-C/ha; BC-2: 35-75 ton-C/ha; BC-3: >75 ton-C/ha;

Table 11. Area size based on land cover clasification at PT GMS

Land Cover	Area size of Carbon Stock Biomass (ha)			Total Area (ha)
	BC-1	BC-2	BC-3	
Secondary Forest	-	135.3	414.3	549.6
Old Shrub	8.7	127.0	87.5	223.2
Shrub	219.9	185.7	37.4	443.0
Scrub	783.1	-	-	783.1
Oil Palm	-	-	-	-
Grand Total	**1,011.7**	**448.0**	**539.2**	**1,998.9***

*) BC-1 : < 35 ton-C/ha; BC-2: 35-75 ton-C/ha; BC-3: >75 ton-C/ha;

Table 12. Recapitulation of total carbon stock PT GMS, 2015

Carbon Source	*Total Carbon Stock* (kilo ton- C)				Average (ton-C/ha)
	BC-1	BC-2	BC-3	Total	
Above Ground Biomass	27.1	12.0	14.5	53.6	26.8
Below Ground Biomass	10.0	4.4	5.3	19.8	9.9
Necromass of litter	0.6	0.3	0.3	1.3	0.6
Soil	161.6	71.6	86.2	319.4	159.8
Grand Total	**199.4**	**88.3**	**106.3**	**394.0**	**197.1**
Width (ha)	**1,011.7**	**448.0**	**539.2**	**1,998.9**	

*) BC-1 : < 35 ton-C/ha; BC-2: 35-75 ton-C/ha; BC-3: >75 ton-C/ha;

Carbon stocks in the area of PT GMS which could be identified and quantified are sourced from Above Ground Biomass (AGB), Below Ground Biomass (BGB), necromass litter and soil carbon. Wood Necromassa of dead trees can not be analyzed due to a very large diversity. The total number of carbon stocks in the area of PT GMS is 394.00 kilo tonnes with an average unit area was 197.10 ton-C / ha. **Table 12** showing the summary of total carbon stocks and their proportion according to the source. Distribution of carbon stock at PT GMS areas has stated on **Figure 10**.

Whereas, total of NPP areas is 473 ha so that the total number of carbon stock < 394.00 kilo tonnes (based on **Table 12**) and carbo stock biomass is < 73.40 kilo tonnes (based on **Table 10**).

Table 13. Estimated Carbon Stock for HCV and Peat Area in PT GMS Area

Land Cover of	Area (ha)	Estimated Carbon Stock
HCV Area		
Secondary Forest	474.22	26,157.98
Old Shrub *(Belukar Tua)*	166.60	7,931.83
Shrub *(Semak Belukar)*	273.76	8,971.12
Bush *(Semak)*	231.22	6,601.33
Oil Palm	128.00	0.00
TOTAL	**1,273.80**	**49,662.26**
Peat Area		
Secondary Forest (counted in HCV Area)	43.53	0.00
Open Land	74.17	2,117.55
TOTAL	**117.70**	**2,117.55**

- **Summary of GHG emission**

There is no scenario of land clearing in PT GMS. This is because there is no land cover with high carbon potential and there is no clearing on peat lands. Both of result of Carbon Stock Assessment and Land Cover analysis is used for Green House Gas (GHG) calculation & mitigation.

Summary of plant has explained on **Table 1** and **figure 9**. Whereas, summary of GHG calculation and total emission (estate & mill) and emission per tonnes of product was explained **Table 14 & 15**. Whereas, chart of emission in estate and mill was explained on **Graphic 1** and **Chart 1**.

Table 14. Summary of GHG calculation (tCO_2e)

Alternatif	Land clearing	Crop Sequest	Fertilizer	N_2O	Fuel	Peat	Conservation Sequest	POME	Fuel Mill	Credit (Electric)
1	1,235.03	- 4,299.22	296.95	459.23	164.77	0	- 3,677.50	0	0	0

Table 15. Total emission (estate*) and emission per ton of product (tCO_2e)

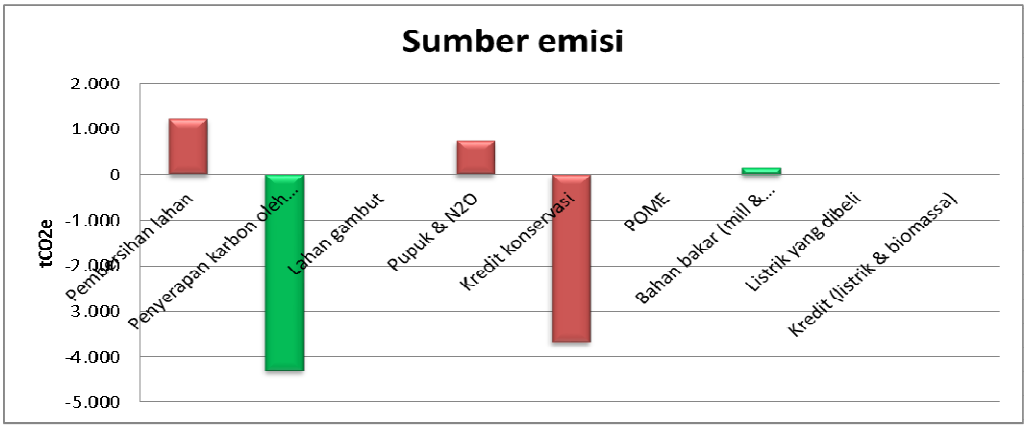
Alternatif	Total Field Emission tCO2e	tCO2/t FFB
1	- 5,281	-0.51

Note : *) There is no plan for mill at PT GMS

Based on GHG calculation mitigation for new planting report that it has explained regarding emission source calculation i.e land conversion, crop sequestration, fertilizer (mineral) manufacture & transport, N2O from fertilizer (mineral & organic) application, fuel consumption (field), sequestration in conservation areas. PT GMS have not POM so that source of emission from POME, fuel consumption (mill) and credit (methane capture, POM & electricity)

is zero. Based on explaination it so that net emission only from estate is – 5,281 tCO_2e, with emission per ton of FFB is -0.51 tCO_2/tFFB.

The company has used RSPO Palm GHG calculator for New Planting version 3.0 as of January 2017. In the previous time that PT GMS has submitted of GHG Report for New Planting (the calculations was still used PalmGHG Calculator version 2.1.1), which includes plans on how to mitigate its emission to RSPO dated on 21 September 2016.



Graphic 1: GHG Calculation based on land clearing

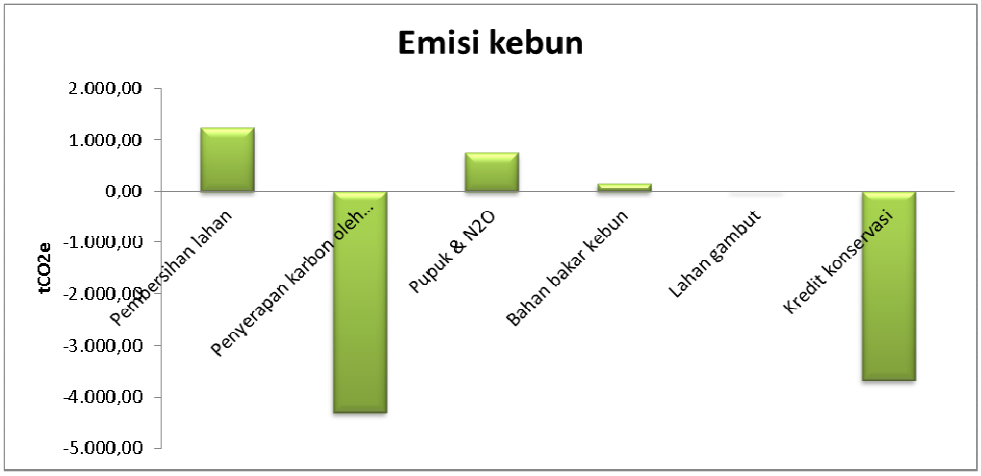


Chart 1. Estate Emission

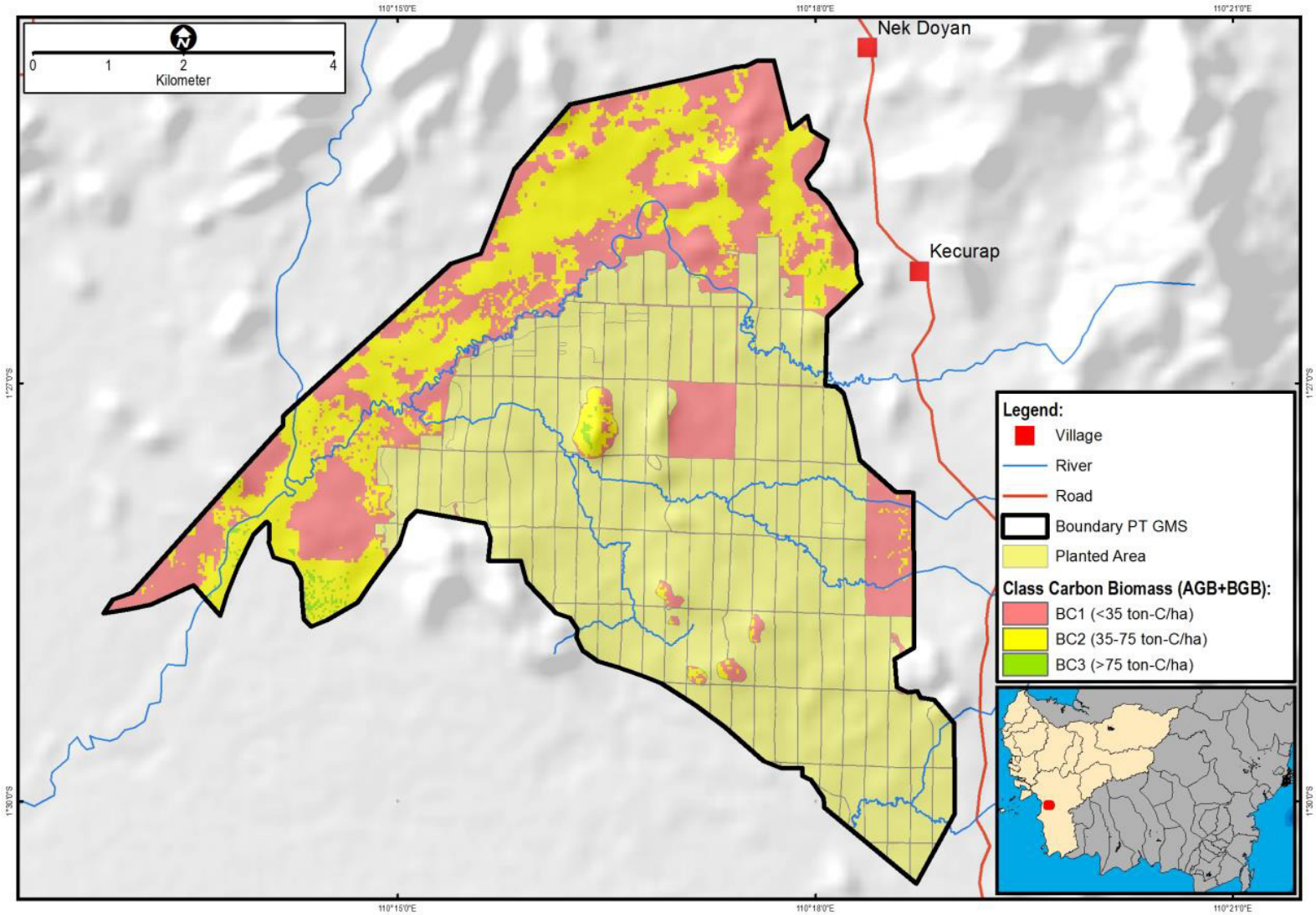


Figure 10. Carbon Biomass Distribution of PT GMS

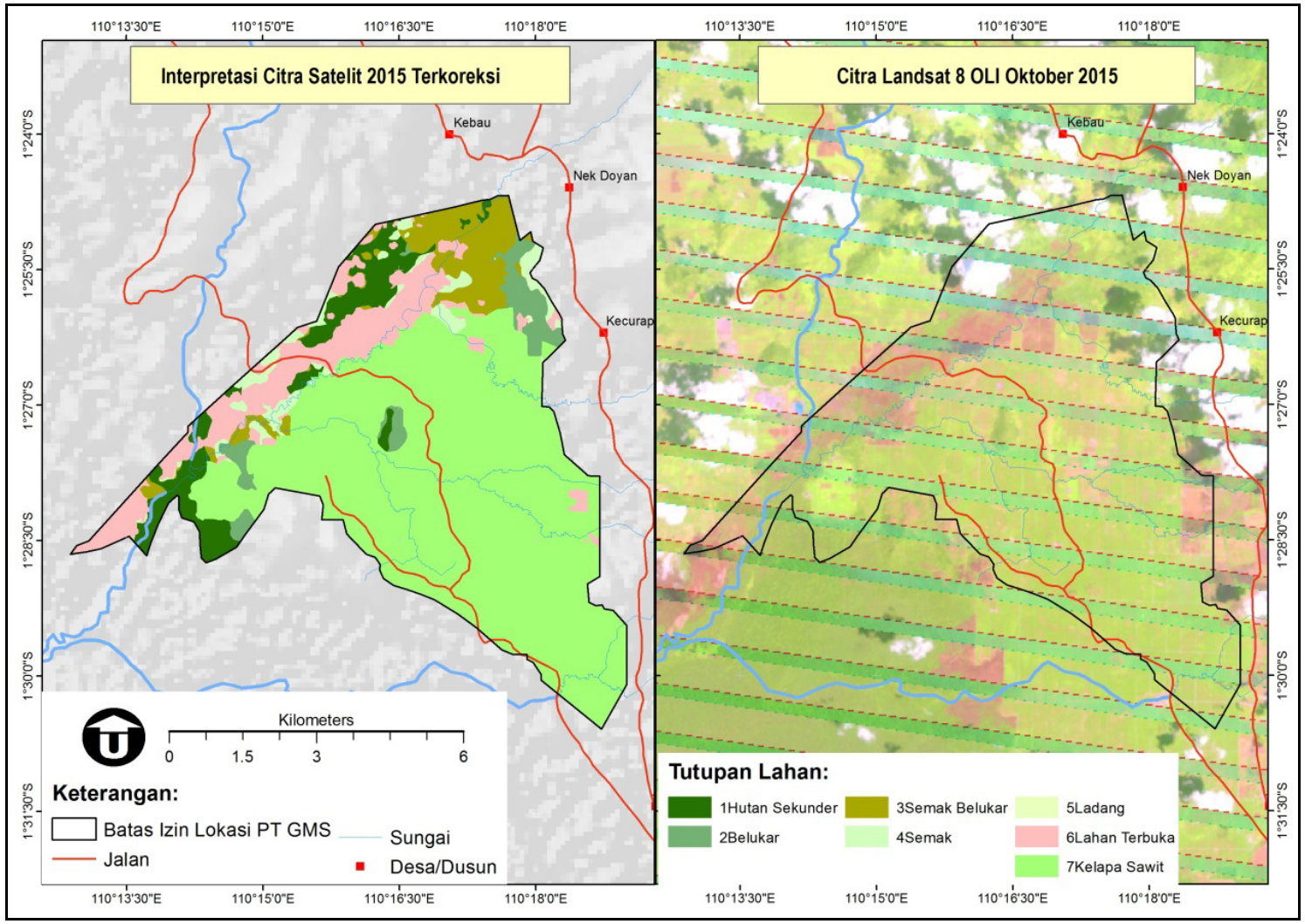


Figure 11. Satelitte imagery year 2015 (based on citra landsat 8 OLI October 2015 & was corrected)

4.6. Land Use Change Analysis

The result of interpretation satelite imagery landsat 8 OLI (dated on 20 October 2015 path/row 120/62) showing on **figure 11**. It has verified on field dated on 19-22 October 2015. Last LUCA review report dated on 24 November 2016 by RSPO secretariat with marked is need clarification.

Based on **figure 11** that land cover condition over PT GMS areas in 2015 are secondary forest, shrub, scrub, bush, traditional plantation, open land and oil palm where it was dominated by oil palm areas. Whereas, based on **figure 9** that there are 6 (six) type of land cover. **Figure 9** & **figure 11** was used satellite imagery which same as base source but the result is different. In the southwest section that there is type of land cover as a bush in previous classified but found in field as open land because there is a fire in the areas. Based on condition it that the consultant was carried out re-interpretation with using new satellite imagery is November 2015 path/row 121/61. Validation method was used Kappa accuracy and overall accuracy.

Based on HCV report (section 1.2) that oil palm planted till November 2015 is **3,110 ha** (exclude of road, ditches & infrastructure).

Calculation of land cover change each period has conducted with baseline of result of sharfile calculation (5,216.50 ha). There is different total of area with location permit (5,190.00 ha) because deliniation process from analog data.

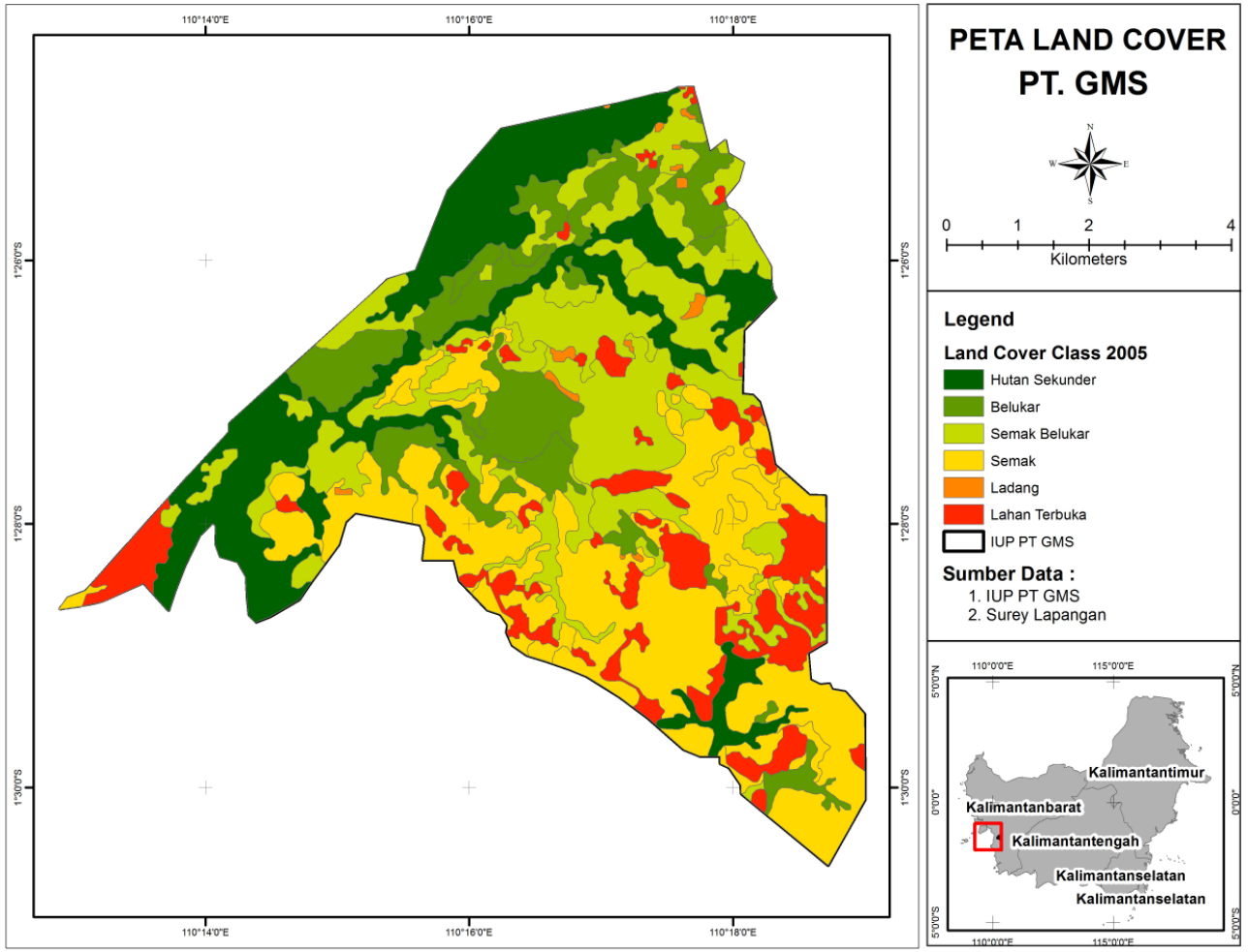
Land use/Land cover analysis has been made in the period November 2005 to November 2007, December 2007 to December 2009, January 2010 to May 2014, and May 2014 to conducting HCV assessment based on Landsat satellite imagery interpretation.

Period of November 2005 to November 2007 that PT GMS area operated by PT GY Plantation join with PT Ketapang Mandiri. LUC period of Nov 2005 to Nov 2007 was stated on **Table 16** and visualed on **Figure 12 & Figure 13**.

Table 16. Land use change period of November 2005 to November 2007

Period		Dec 2007							
	Land Cover	Secondary forest	Shrub	Scrub	Bush	Traditional plantation	Open land	Oil palm	Total Nov-05
Nov 2005	**A. Comersial**								
	Secondary forest	-	-	-	0.1	-	39.1	113.7	152.9
	Shrub	-	-	-	8.6	-	59.6	245.9	314.1
	Scrub	-	-	-	48.5	-	215.0	489.7	753.1
	Bush	-	-	-	46.3	-	82.1	1,285.1	1,413.6
	Traditional plantation	-	-	-	0.5	-	2.4	13.0	16.0
	Open land	-	-	-	16.1	-	59.3	344.5	419.9
	Sum A	**-**	**-**	**-**	**120.1**	**-**	**457.5**	**2,491.9**	**3,069.6**
	B. Non-comersial								
	Secondary forest	872.7	9.0	19.8	21.8	-	28.4	-	951.8
	Shrub	-	276.3	61.8	101.7	2.1	-	-	442.0
	Scrub	-	-	430.1	94.0	5.3	13.9	-	543.2
	Bush	-	-	10.2	31.0	-	1.6	-	42.7
	Traditional plantation	-	-	3.7	6.3	3.3	0.4	-	13.7
	Open land	-	-	5.0	35.9	1.1	111.4	-	153.5
	Sum B	**872.7**	**285.4**	**530.6**	**290.8**	**11.8**	**155.7**	**-**	**2,147.0**
	Total Des-07 (A+B)	**872.7**	**285.4**	**530.6**	**410.9**	**11.8**	**613.2**	**2,491.9**	**5,216.5**

Note :
: coefisien of vegetation is 0,7
: coefisien of vegetation is 0
: Land cover which not change



Note : Hutan Sekunder = Secondary forest; Belukar = Shrub; Semak Belukar = Scrub, Semak = Bush, Ladang = Traditional Plantation & Lahan Terbuka = Open Land

Figure 12. Land Cover Map year 2005

Period of November 2005 to November 2007, the company has converted from open land to oil palm amount of 344.5 ha. Whereas, total of oil palm areas are 2,491.9 ha. Land cover with non-comersial category has occurred because community activities such as shifting cultivation, harvest of forest products (wood and non-wood) and hunting. These activities can be degradation of land cover. Change of land cover to be land cover which better because there is succession process.

Period of December 2007 to December 2009 that PT GMS area operated by PT GY Plantation join with PT Ketapang Mandiri. LUC period of December 2007 to December 2009 was stated on **Table 17** and visualed on **Figure 13 & Figure 14**.

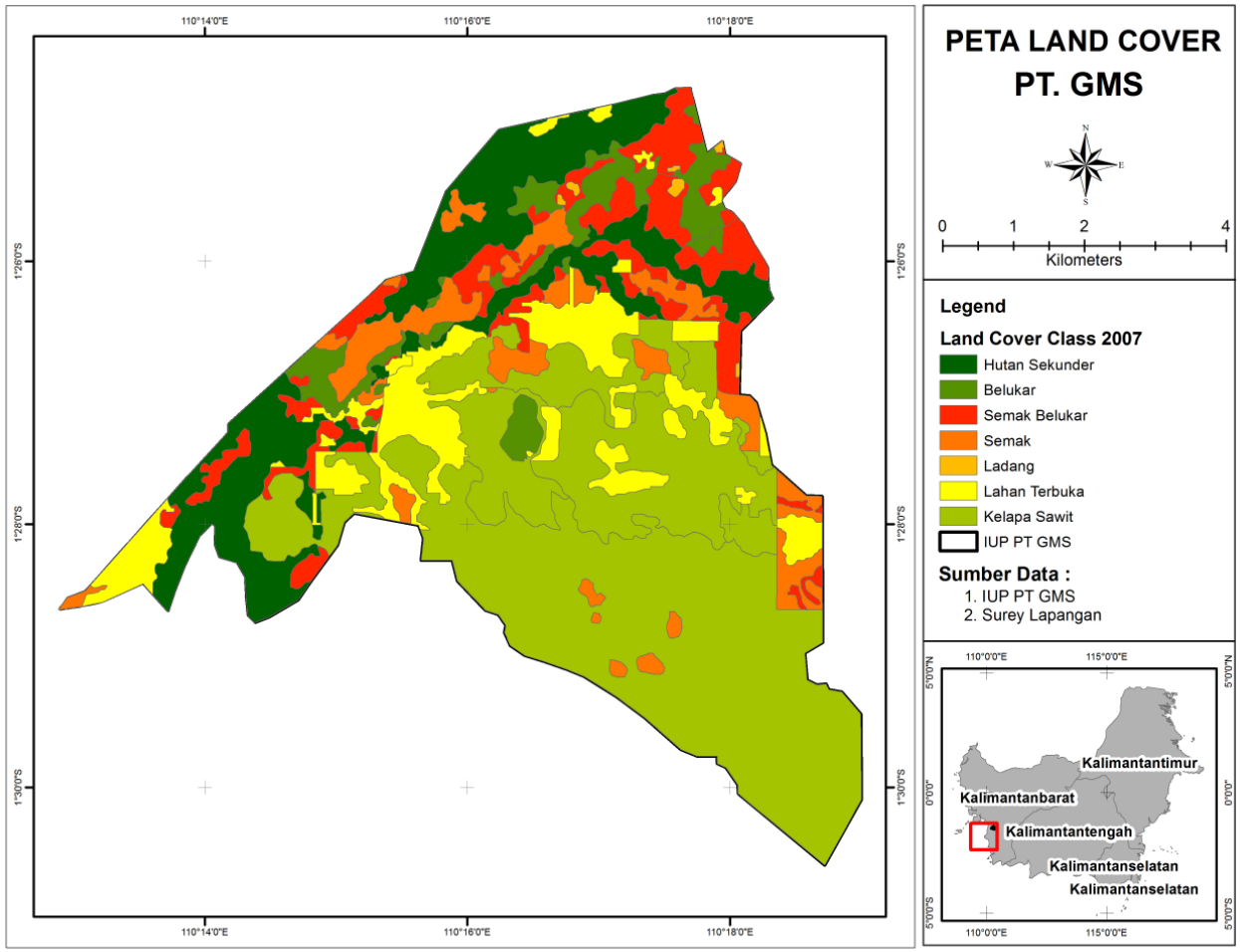
Table 17. Land use change period of December 2007 to December 2009

Period		Dec 2009							
	Land Cover	Secondary forest	Shrub	Scrub	Bush	Traditional plantation	Open land	Oil palm	Total Dec-07
Dec 2007	**A. Comersial**								
	Secondary forest	-	-	-	-	-	1.0	-	1.0
	Shrub	-	-	-	-	-	-	-	-
	Scrub	-	-	-	-	-	5.6	9.6	15.2
	Bush	-	-	-	28.5	-	32.4	59.3	120.1
	Traditional plantation	-	-	-	-	-	-	-	-
	Open land	-	-	-	0.7	-	125.3	332.2	458.2
	Oil Palm				-		365.0	2,043.6	2,408.5
	Sum A	**-**	**-**	**-**	**29.2**	**-**	**529.2**	**2,444.6**	**3,003.0**
	B. Non-comersial								
	Secondary forest	777.7	2.6	26.4	17.3	-	47.8	-	871.7
	Shrub	-	211.3	12.5	7.9	-	53.6	-	285.4
	Scrub	-	-	385.1	27.4	1.4	101.6	-	515.4
	Bush	-	-	29.5	175.5	-	85.8	-	290.8
	Traditional plantation	-	-	5.4	-	2.7	3.7	-	11.8
	Open land	-	-	8.1	36.2	-	110.7	-	155.0
	Oil Palm			40.6	-	-	42.8	-	83.4
	Sum B	**777.7**	**213.9**	**507.7**	**264.3**	**4.0**	**446.0**	**-**	**2,213.5**
	Total Des-09 (A+B)	**777.7**	**213.9**	**507.7**	**293.5**	**4.0**	**975.1**	**-**	**5,216.5**

Note :
: coefisien of vegetation is 0,7
: coefisien of vegetation is 0
: Land cover which not change

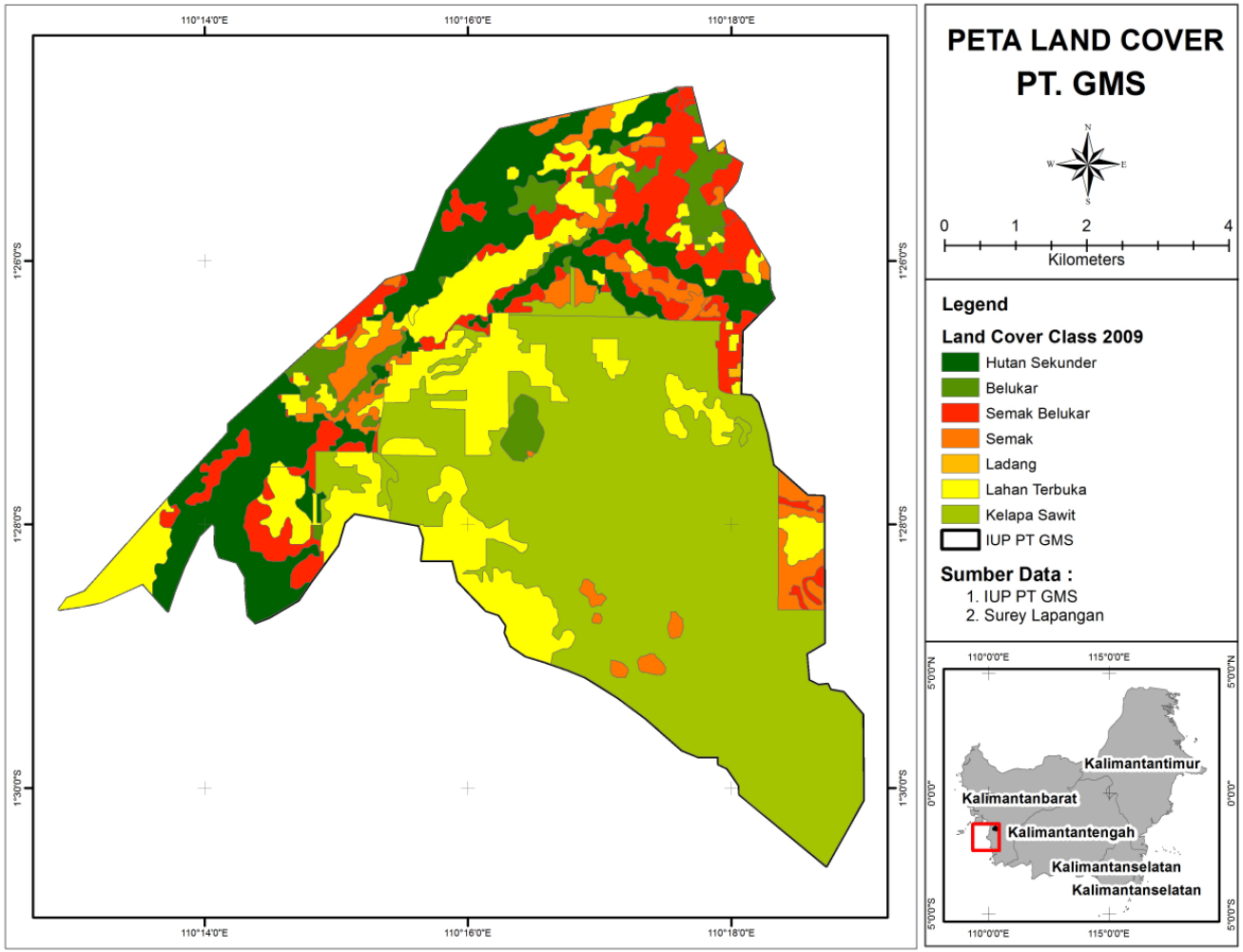
Period of December 2007 to December 2009, the company has converted to oil palm amount of 65.9 ha. Whereas, change of land cover from open land to oil palm is 332.2 ha so that total of oil palm areas are 2,999.6 ha.

Period of January 2010 to May 2014 that PT GMS area operated by PT GY Plantation join with PT Ketapang Mandiri until December 2010 and PT KMS and Westbrook International manage areas it since December 2011. PT KMS and Westbrook International has assissted BGA Group by PT LSM. LUC period of January 2010 to May 2014 was stated on **Table 18** and visualed on **Figure 14 & Figure 15**.



Note : Hutan Sekunder = Secondary forest; Belukar = Shrub; Semak Belukar = Scrub, Semak = Bush, Ladang = Traditional Plantation & Lahan Terbuka = Open Land

Figure 13. Land Cover Map Year 2007



Note : Hutan Sekunder = Secondary forest; Belukar = Shrub; Semak Belukar = Scrub, Semak = Bush, Ladang = Traditional Plantation & Lahan Terbuka = Open Land

Figure 14. Land Cover Map Year 2009

Table 18. Land use change period of January 2010 to May 2014

Period		May-2014							
	Land Cover	**Secondary forest**	**Shrub**	**Scrub**	**Bush**	**Traditional plantation**	**Open land**	**Oil palm**	**Total Jan-10**
Jan-2010	**A. Comersial**								
	Secondary forest	-	-	-	5.6	-	-	47.6	53.2
	Shrub	-	-	-	-	-	-	2.8	2.8
	Scrub	-	-	-	7.0	-	-	101.3	108.4
	Bush	-	-	-	37.7	-	-	45.9	83.6
	Traditional plantation	-	-	-	-	-	-	2.5	2.5
	Open land	-	-	-	1.6	-	-	584.1	585.7
	Oil palm	-	-	-	-	-	-	2,443.8	2,443.8
	Sum A	**-**	**-**	**-**	**52.0**	**-**	**-**	**3,228.0**	**3,280.0**
	B. Non-Comersial								
	Secondary forest	590.8	29.5	39.1	52.6	10.7	1.7	-	724.5
	Shrub	-	190.1	8.4	12.6	-	-	-	211.1
	Scrub	-	20.1	322.6	56.6	-	-	-	399.3
	Bush	-	0.1	52.0	157.8	-	-	-	209.8
	Traditional plantation	-	-	-	1.6	-	-	-	1.6
	Open land	-	-	16.4	246.7	3.8	122.5	-	389.4
	Oil Palm	-	-	-	0.8	-	-	-	0.8
	Sum B	**590.8**	**239.8**	**438.5**	**528.8**	**14.5**	**124.1**	**-**	**1,936.6**
	Total May-14 (A+B)	**590.8**	**239.8**	**438.5**	**580.7**	**14.5**	**124.1**	**3,228.0**	**5,216.5**

Note :
: coefisien of vegetation is 0,7
: coefisien of vegetation is 0
: Land cover which not change

Period of January 2010 to May 2014, the company has converted to oil palm amount of 784.2 ha. Whereas, change of land cover from open land to oil palm is 584.1 ha so that total of oil palm areas are 3,228.0 ha.

Period of August 2014 till HCV assessment that BGA group has not been managed areas it. LUC period of May 2014 to Oct 2015 was stated on **Table 19** and visualed on **Figure 15 & Figure 16**.

Table 19. Land use change period of May 2014 to Oct 2015

Period		Oct-2015 (conducting HCV assessment)							
	Land Cover	**Secondary forest**	**Shrub**	**Scrub**	**Bush**	**Traditional plantation**	**Open land**	**Oil palm**	**Total May-14**
May-2014	**A. Commecial**								
	Secondary forest	-	-	-	-	-	-		-
	Shrub	-	-	-	-	-	-		-
	Scrub	-	-	-	-	-	-		-
	Bush	-	-	-	29.2	-	23.9	4.0	**57.0**
	Traditional plantation	-	-	-	-	-	14.4	3,213.6	**3,228.0**
	Open land	-	-	-	-	-	-	-	-
	Oil palm	-	-	-	-	-	-	-	-
	Sum A	**-**	**-**	**-**	**29.2**	**-**	**38.2**	**3,217.6**	**3,285.0**

Period		Oct-2015 (conducting HCV assessment)							
	Land Cover	Secondary forest	Shrub	Scrub	Bush	Traditional plantation	Open land	Oil palm	Total May-14
	B. Non-Commercial								
	Secondary forest	549.6	0.1	7.4	12.2	3.9	17.7	-	**590.8**
	Shrub	-	223.2	8.2	0.5	-	8.0	-	**239.8**
	Scrub	-	-	347.4	61.7	-	29.5	-	**438.5**
	Bush	-	-	80.0	208.2	-	235.6	-	**523.7**
	Traditional plantation	-	-	-	4.5	9.2	0.8	-	**14.5**
	Open land	-	-	-	4.0	-	120.1	-	**124.1**
	Oil palm	-	-	-	-	-	-	-	**-**
	Sum B	**549.6**	**223.2**	**443.0**	**290.9**	13.1	**411.7**	-	**1,931.5**
	Total Oct-15 (A+B)	**549.6**	**223.2**	**443.0**	**320.1**	**13.1**	**449.9**	**3,217.6**	**5,216.5**

Note : : coefisien of vegetation is 0,7
: coefisien of vegetation is 0
: Land cover which not change

Period of May 2014 to Oct 2015 (conducting HCV assessment), the company has converted to oil palm amount of 3,217.6 ha. Whereas, change of land cover from open land to oil palm is 0.0 ha so that total of oil palm areas are 3,217.6 ha. .

4.7. FPIC process

The company has the Implementation Procedures Indemnity Planting and Land (Compensation) No. BGA-SOP-GL903.1-R0.The procedure describes the steps in the implementation of compensation, several stages being taken are conduct an inventory of land to be compensable, socialization to the land owners, compensation approval by management, payment, handing over the land, and documentation. Inside procedure has provided the opportunity for the land owners to negotiate in determining the amount of the compensation.

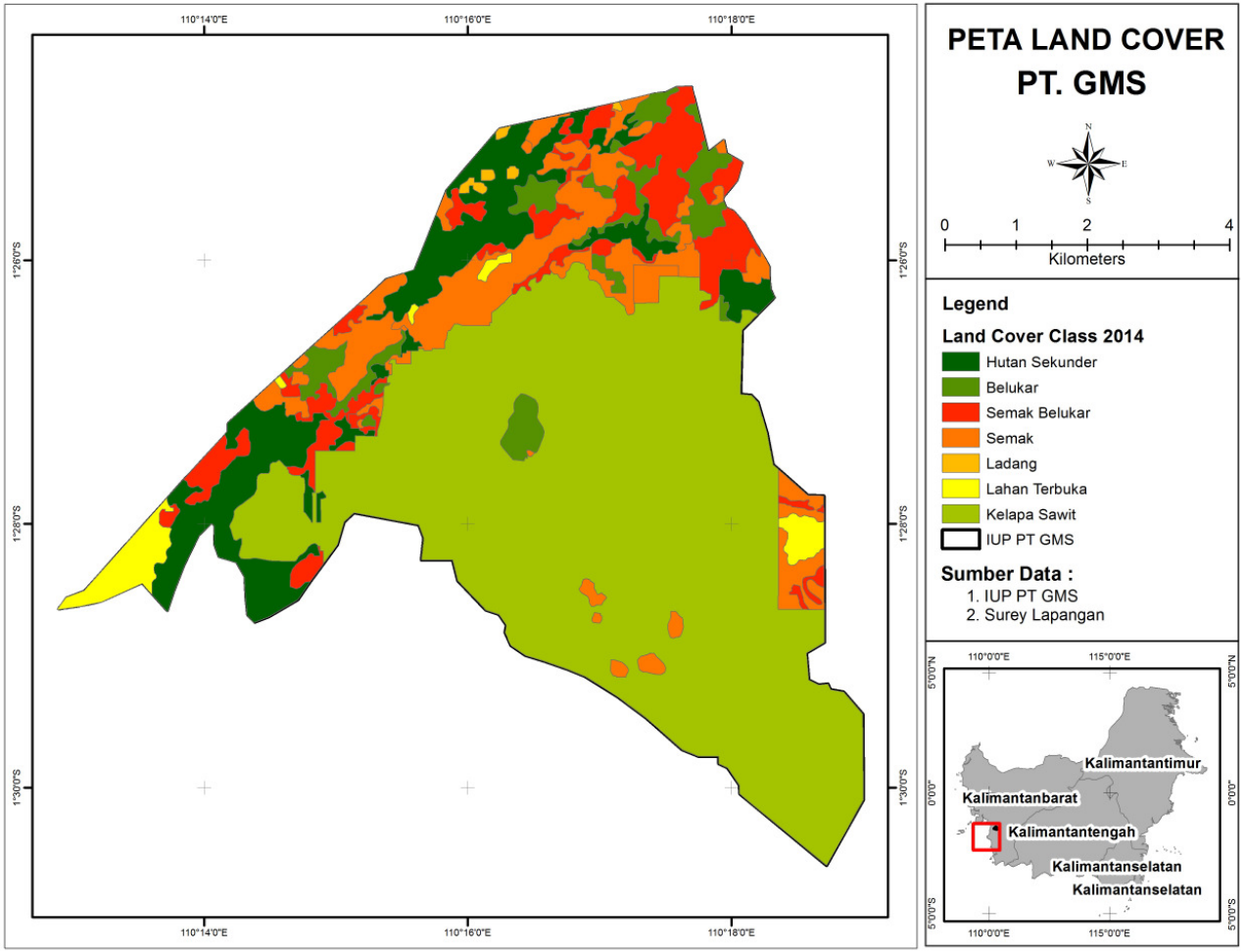
Based on the results of stakeholder consultations (Focus Group Discussion) with the village leaders, community leaders and some residents of the villages around the plantation areas are obtained information that the company is in the process of compensation and the settlement of some land issue.

Land acquisition process through the mechanism of compensation archived in each management unit (Estate) in form of the documents of Compensation and Land (Ganti Rugi Tanam Tumbuh).

There are the participatory identification of local people's land where it can be demonstrated that there are legal, customary or user rights example compensation (Tali Asih) for land release on May 22, 2012 which recognized the customary known as Kepatahan Parang / Keputingan Beliung (based on minute of compensation). History of recognize of the customary land or traditional land was available. The recognition of indigenous/traditional land that was once used as a community economic livelihood however they did not / have not been reused managed. The compensations are provided through the Village Chief, Village Chief, Demong Adat (Tribe Leader) and BPD (Communitty representatives). The land as compensation object located in an area of 2,290.73 Ha at Nek Doyan sub village.

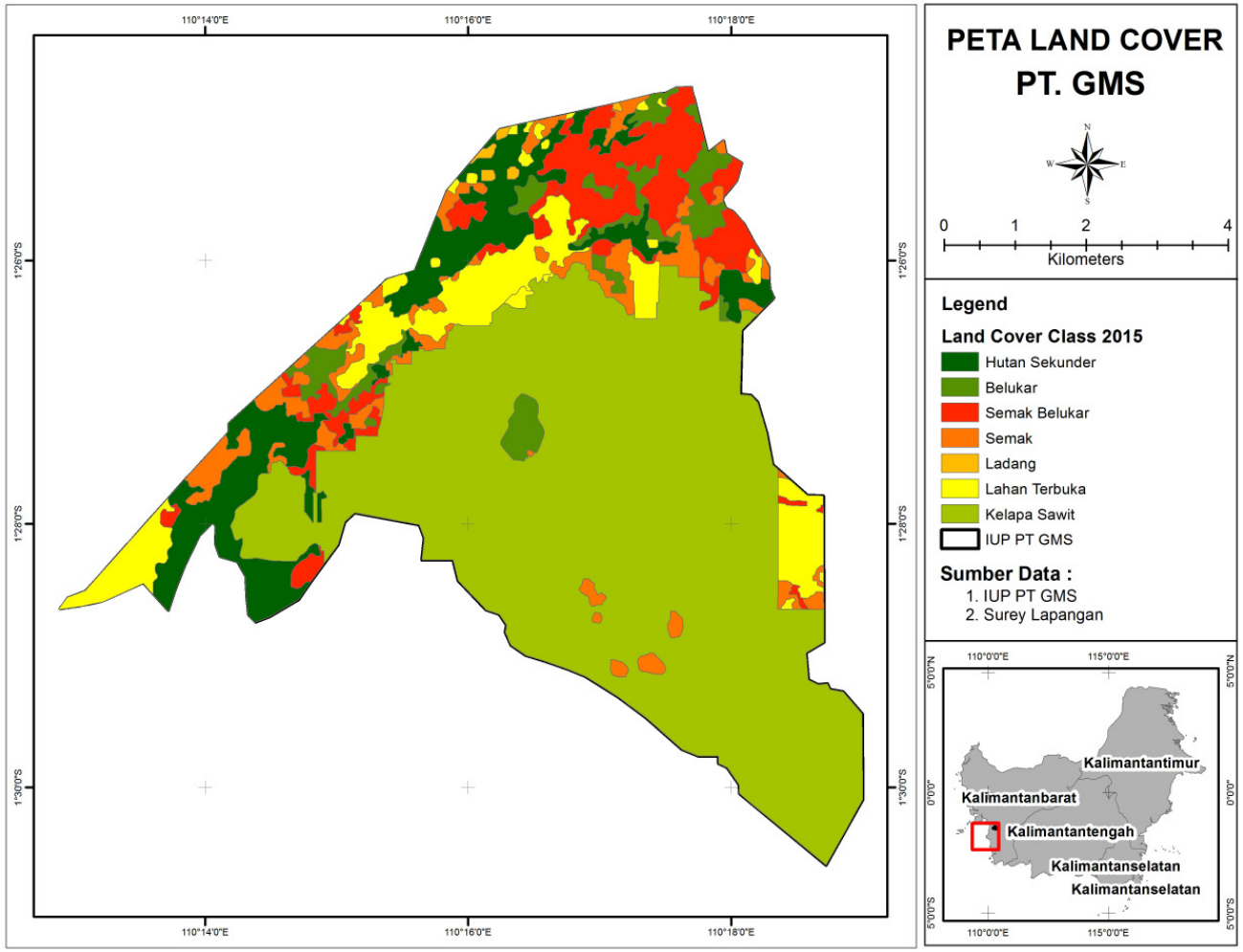
The Company has acquired some land that previously belonged to the community in private and it is not part of customary land. The land acquisition process has based on the FPIC process according RSPO requirement and company's procedure.

There are also areas in the indication as HCV areas but so far the company has not shown evidence of FPIC activities on public land located within the indicated as HCV areas.



Note : Hutan Sekunder = Secondary forest; Belukar = Shrub; Semak Belukar = Scrub, Semak = Bush, Ladang = Traditional Plantation & Lahan Terbuka = Open Land

Figure 15. Land Cover Map Year 2014



Note : Hutan Sekunder = Secondary forest; Belukar = Shrub; Semak Belukar = Scrub, Semak = Bush, Ladang = Traditional Plantation & Lahan Terbuka = Open Land

Figure 16. Land Cover Map Year 2015

The record of compensation in the Nek Doyan sub village, Laman Satong village year 2012 approximate 866.70 ha was available. Sample of compensation records (transaction on June 2012 & October 2012) are :

- Sumardi, a land area of 11.43 ha with vegetation plant and compensation received dated on June 19, 2012 with IDR 9,144,000.
- Aja, an area of 6.06 ha with vegetation plant and compensation received dated on June 19, 2012 with IDR 4,848,000.
- Yunus Kinta an area of 0.59 ha, there is not vegetation and compensation received dated on October 20, 2012 with IDR 885,000.
- Sap an area of 2.51 ha, there is not vegetation and compensation received dated on October 20, 2012 with IDR 3,765,000

5. Summary of management plans

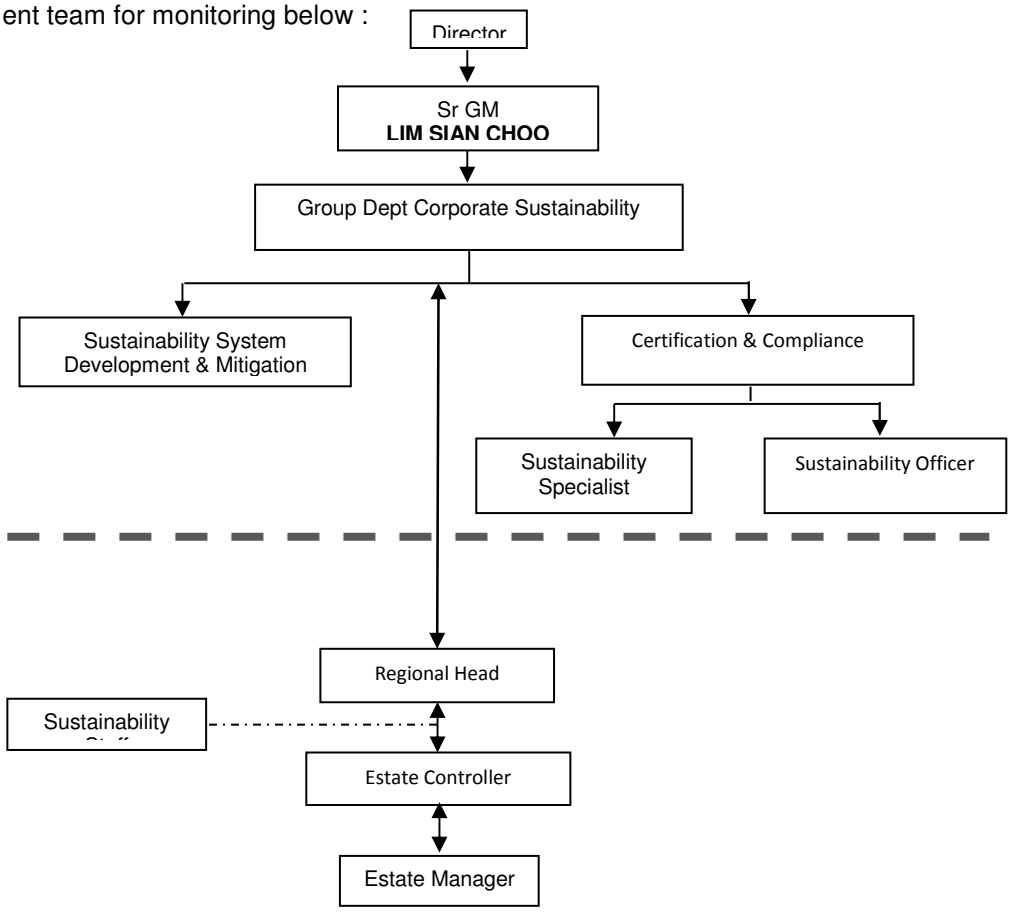
5.1. Team responsible for developing management plans

The process of HCV and SIA development and preparation of management and monitoring plans for PT GMS was implemented in phases involving several parties: Estate Department, the Public Affairs (PAD Department), Corporate Social Responsibility (CSR) Department, GIS Department and Sustainability Department. The whole process is in accordance with the plans facilitated by the Corporate Sustainability Department Head Office BGA Group. The details of the parties involved in the HCV and SIA development and preparation of management and monitoring plans are summarized in the following table :

Table 20. The participatory list of developing management and monitoring plans for PT GMS

No.	Name	Department	Official Role
HCV Management & Monitoring Plan			
1.	Eko Budhi Purnomo	Region Head	Participant
2.	Wilson Situmorang	Estate Controller	Participant
3.	Lim Sian Choo	Head of CSR & Corp. Sustainability	Participant
4.	Hidayat Aprilianto	Head of Sustainability System Development & Mitigation	Participant
5.	Amir Hamzah	EHS Specialist	Facilitator
6.	Ardhan Yeza	GIS Specialist	Facilitator
7.	Saeshaputi Rahmanita P	Sustainability Staff HO	Facilitator
SIA Management & Monitoring Plan			
1.	Eko Budhi Purnomo	Region Head	Participant
2.	Wilson Situmorang	Estate Controller	Participant
3.	Agus Wiastonol	CSR Specialist HO	Participant
4.	Mtangguh TAM	CSR Staff	Participant
Internal Review of the HCV and SIA Reports, Management and Monitoring Plans (at Head Office)			
1.	Mukhlis Bentara	Head of KalBar	Reviewer
2.	Lim Sian Choo	Head of CSR & Corp. Sustainability	Reviewer
3.	Hidayat Aprilianto	Head of Sustainability System Development & Mitigation	Reviewer

Whereas, management team for monitoring below :



5.2. Elements to be included in management plans

- **Social management & monitoring plan**

The process of the SIA development and preparation of management plans and monitoring of PT GMS also involved relevant stakeholders such as local communities, the government of local village and Sub-District. It is aimed to provide opportunities for communication and sharing of information/opinion/suggestions between the PT GMS and stakeholders. Focus Group for Discussion consisted of people who were respondents (the workers, local communities and local government).

Important issues that are related to sustainable development of oil palm plantations in PT GMS, District of Ketapang, West Kalimantan Province in stakeholder consultation activities, are :

1) Socialization activity needs to be continuously carried out in a transparent way, so that local communities are aware of the overall development plan of PT GMS.
2) Land acquisition (and compensation) procedure are to be carried out with FPIC, When any problems occur, it must be settled with agreement of parties concerned.
3) Local community in Permitted Area of PT GMS hope that the development of oil palm plantation will bring positive impacts and minimize negative impacts from oil palm plantation on development of environment, HCV and social (SIA) aspects.
4) Village community in Permitted Area of PT GMS hoped that the company be managed in good way and in accordance with RSPO P&C as the sustainable oil palm plantation and maintain good coordination among the stakeholders (company, community, NGO and government)

Table 21. Summary of Management and Mitigation Plans on Social Impact Assessment

Program	Activities	Weakness	Strength	Implemented Program	Purposes of Implementation	Timeline
Economic Empowerment	Economic empowerment project for Nek Doyan Hamlet's people	a. Lack of knowledge and understanding about entrepreneurship b. High number of community worked workers in plantations and mills	a. Bumitama has a community development model which could be copied and paste based on past experience from its other subsidiaries b. There is a workable potential in the community c. There is land potential around the community land that can be utilized for economic empowerment and alternative livelihood project.	a. Formatting of business groups that suit with the village's potential b. Forming the management socialization team by involving Muspika, companies and related institution (village, sub-district, agencies) c. Training local people in entrepreneurship d. Creating pilot project for community's business, in accordance with the village's potential and planned market for the produce and product (agricultural, farming) e. Empowering Plasma Cooperative & plasma cooperative members f. Look into non forest timber product type of business too, to take away some burden of foraging from the forested area.	a. Changing people's paradigm of dependence as a planter workers to become self-reliant community to develop entrepreneurship b. Create a new job opportunities in local level by developing an alternative livelihood business model c. Provide alternative source of revenues for the plasma cooperative and members beside of the SHK	2016 and continuous
Tradition of land clearing by burning	Provide an understanding to the peoples about the dangers and impact of burning, and the law and the risk of violation	a. Less of people's knowledge about the dangers of burning b. Strong tradition of land clearing by burning c. Unavailability of fire-fighting equipment in the task force, the platoon village or group formed to conduct fire prevention and anticipation	a. Bumitama is in cooperation with BKSDA for fire prevention and anticipation program b. Bumitama is in cooperation with related institutions for fire prevention and management program (Muspida, Muspika, Manggala Agni & Forestry Agencies)	a. Forming the program of village free from fire b. Forming the task force group together with the local people c. Socialization by related department (D&L, Sustainability & CSR Team), about legal sanction if do the land burning (work with police agencies) d. Training in fire fighting, fire prevention & anticipation of the fire task force group and/or platoon village	a. Changing the mindset of peoples, from the habit of land clearing by burning	2016 and continuous
Increasing village and hamlet	Provide the education development	a. Educational facilities are still relatively low b. High rate of dropout	a. High commitment from the company b. High motivation of education	a. Partner with school, community and government in providing up-to-date and quality education program.	a. Development and improvement the quality of education for people around company	2016-2018

Program	Activities	Weakness	Strength	Implemented Program	Purposes of Implementation	Timeline
educational quality	planning to the people around the company	c. Community interests in education are varied d. Low levels of education in community will hamper the fulfillment of quality and skilled labor from the local community	and training from the people c. Opportunities to get support from the government for program that aligns with government programme d. Use of education to alleviate poverty of the next generation of local people.	b. Making a priority scale of which school will be used as a partner school according to company's ability c. Work with local government and related institution to improving the quality of education in the external school. d. Provide the intensive training to employees of the local communities, to enhance the competitive value and productivity for local workers	b. By increasing the quality of education for the community, will help improve community resource so it has more opportunities , especially in fulfilling labor c. By increasing the quality of education for the community, will help to reduce jealousy and social inequalities	
	Provide an assistance for developing of educational facilities	Low educational facilitates	Facilities and educational activities have been running	Conducting educational facilities development plan by priority	Increase in educational facilitates in villages around the company	2016-2018
	Improving the educational quality for schools around the company	Less of teachers in various schools around the company	Supports from the government in education	a. Make a detailed plan for the implementation of activities b. Training to improve the quality of teachers c. Involving government and communities	Improvement in education quality for the people around the company	2016-2018
Employee carrier path	Provide an assessment to the workers against their productivity on work	Most of the workers came from nearby areas/villages with minimal capability	The company has the procedure to do the assessment & has a minimum standard to be met by the workers	The transition period of the company ownership (under Bumitama), the assessment has not been conducted	a. Provide the trainings to the workers according to company needs, so that the existing workers can meet the company standards. b. Workers can earn a good career path with good income as well	2017 and continuous
Employee recruitment	Selection/ recruit the employees by giving the priority to the local people which meet with the company's needs/ standard	Most of local people have a low level of educational, so they only could be a laborer	The company has a training program to the workers, so it can improve their skill	Training only for the workers who has been work at the company	Engaged with the government training institutes to provide the training to the local people	2017 and continuous

The matrix of social management and monitoring plan above not covering regarding external issues which has raised on the FGD activity. External issues such as Communication and social relations, Recruitment and Labor Management, Infrastructure development, Land Acquisition, Land-Clearing, Harvesting, FFB Transportation. Related to Infrastructure development → Contractor payment, Harvesting →FFB stealing, FFB Transportation → business partnership from local contractor.

Although communication and social relations, recruitment and labor management, land acquisition and land clearing has not covered on the matrix of social management and monitoring plan but it has covered on environmental management plan (*Rencana Kelola Lingkungan*) and environmental monitoring plan (*Rencana Pemantauan Lingkungan*).

- **Environmental management & monitoring plan**

The Environment Management & Monitoring Document (EIA/ AMDAL) was approved by Head Regency of Ketapang, by decree number 743/KLH-B/2015, dated: 03 November 2015.

Table 22. Summary of Management and Mitigation Plans on Environment Impact Assessment

No	Impact	Source of Impact	Location	Environment Management		Environment Monitoring	
				Plan	Period	Indicator & methode	Period
1	People's behavioral pattern	- Operational socialization - Company's delineation, land acquisition - Land clearing - Transportation of FFB - De-mobilization of equipment	Villages on Matan Hilir Utara Sub-district	- Socialization on every steps of activity transparently to villagers - Good engagement and community with community's leader and public figure - Work & coordination with government institutions of village, district and related agencies - Performs various activities that show company's concern to community interest - CSR activities according to local people needs	Twice on pre-construction phase	Increasing the positive perception of the public against the plantation activities. **Methods**: observation and interviews	Once per year
2	Changes on people's perception	- Community development program	Villages on Matan Hilir Utara Sub-district	- Regular socialization and improve transparently to local villagers - Performs various activities that show company's concern to community interest - Forming the organization of environmental management that is integrated with the company's organizational structure	Twice on pre-construction phase	Disruption of social relationships in the community. **Methods**: observation and interviews	Once per 6 months during construction phase or more frequently, depending on needs and condition
3	Social conflict	Land acquisitions	Villages on	**Technology approach:**	Three times on	There are no disputes and	Once per 6

No	Impact	Source of Impact	Location	Environment Management		Environment Monitoring	
				Plan	Period	Indicator & methode	Period
			Matan Hilir Utara Sub-district	Socio-education to community about oil palm plantation & mill - Provides an overview of environmental improvement after the presence of plantations and palm oil mills **Socio-economic approach:** - Socialization to communities around the plantations and palm oil mills, regarding the procedures for land acquisition **Institutional Approaches:** - Do and handling of community's problem	pre-construction phase	disagreement between the community with the company or with the workers in the company. **Methods**: observation and interviews	months on construction phase, continuous intensively when needed
4	Economic activity	- Employee recruitment - Harvesting	Villages on Matan Hilir Utara Sub-district	**Socio-economic approach:** - Facilitating affected communities, to participate actively in economic activity, and into the development of their area - Allocating funding to carry out the activities mentioned above **Institutional approach:** - Participate in forming village organizations or environmental management division in the company, that responsible to the economic growth of communities around, such as activate and reactivate the function of KUD - To coordinate with the local village, in the planning and execution of partnership programs with local communities	Once on community development process	Build facilities and infrastructure of the economy, increased economic activities, such as markets, grocery shop, as well as other productive activities. **Methods**: Field survey and interviews	Once per 3 months or continuous intensively when needed
6	People income	Employee recruitment Land clearing contract	Villages on Matan Hilir Utara Sub-district	- Work with community and other economic institutions (UKM & cooperative) and related agencies to improve/develop locals economic situation - Socialization & training to community to improve the skills of local youth so that they are able to compete and work on productive activities in the rural	Four times on the construction phase	- Increasing business opportunities for people who are directly affected by operational activities - Number of local labor that can be absorbed into the operational activities - Community's consumption levels and cost of living - Good use of revenues, such as,	Once per 6 months, or increase intensively when needed

No	Impact	Source of Impact	Location	Environment Management		Environment Monitoring	
				Plan	Period	Indicator & methode	Period
				environment. - To coordinate with the Government Institutions of Village, District, and the related agencies to enforce labor laws so as to encourage the spirit of employment of local labor. - Developing community institutions through physical support and organizational development		productive and future-oriented. - Does not increase the negative things, such as gambling, alcohol, prostitution, etc. **Methods**: data compilation & interviews	
7	Ambient air quality	- Mobilization of heavy equipment and materials - Land clearing - Transportation of FFB - De-mobilization of equipment	Emplacement and Villages on Matan Hilir Utara Sub-district	- Technology approach: - Plant to reforestation along the way around settlement and emplacement - Air quality testing - Socio-economic approach: - Facilitating the communities to participate the reforestation - Socialization to the workers to wear mask at work - Financial allocating to implement technological, socio-economic and institutional approaches - Institutional approach: - Work with accredited institution/ laboratory to do air quality testing	Once every 3 months on dry season and once every 6 months on rainy season	- Parameters of air quality and noise levels in accordance with laws and regulations - Controlling and preventing the arising derivative impact of air quality reduction - Environmental quality analysis reports to relevant agencies	- Once per 3 months. - Reporting to relevant agencies: once per 6 months
8	Public health level	- Mobilization of heavy equipment and materials - Maintain oil palm plants	Villages on Matan Hilir Utara Sub-district	**Technology approach**: - Routine medical check up to the workers - Socialization of the important to wear PPE - Provide the medical clinic **Socio-economic approach**: - Provide the appropriate PPE for workers - Giving supplements to workers who susceptible to contamination due to the operation of the tools plantations and palm oil mills - Providing health insurance for workers - Provide environmental sanitation such as toilet construction which is eligible. **Instituional approach**:	Four times during construction phase	Decrease levels of public health and workers by the increasing number of visits due to respiratory diseases. **Methods**: - Medical check up for the workers - data analysis from the company clinic	Once per 6 months

No	Impact	Source of Impact	Location	Environment Management		Environment Monitoring	
				Plan	Period	Indicator & methode	Period
				- Working closely with agencies such as health centers in the preparation of medical personnel and clinics			
9	Water quality	- Land clearing - Maintaing oil palm pants - Palm oil mill construction & operation - POME Aplication	- The rivers around company - Mills area and plantation area	**Technology approach**: - No land clearing on the riparian area/ greenbelt. Put the signboard of prohibition to damage the riparian area - Maintaining the drainage and roads through road hardening, to reducing the erosion rate - supervise and control the use of chemical fertilizers and pesticides - POME test before its application to plantation **Socio-economic approach**: - Socialization to the workers and community, about land and water conservation, protected area and riparian area conservation - Budget allocation to water conservation, protected area and riparian area conservation **Institutional approach**: - Work with accredited laboratory to do water quality test	- Once every 3 months on dry season and once every 6 months on rainy season - POME test: once per month	- There are no water pollutan by chemicals, waste, POME and any other opertional activities impacts. - Environmental quality analysis reports to relevant agencies **Methods**: water quality testing	- Once per 3 months. - Reporting to relevant agencies: once per 6 months
10	Land and forest fire potential	- Land clearing	Villages around company	**Technology approach**: - Land clearing without burning **Socio-economic approach**: - Socialization to the community to do land clearing without burning - Involving the community to provide and maintaining drainage and planting of cover crops - Involving the community in providing the seeds for enrichment plants and rehabilitations **Institutional approach**: - Work with related agencies (Manggala Agni, BKSDA, etc) to implement the fire prevention program - Forming the fire fighting group and	Continuous intensively, especially on dry season	There is no land fire in the company and around. **Methods**: field survey monitoring & online hot spot monitoring	Continuous intensively, especially on dry season

No	Impact	Source of Impact	Location	Environment Management		Environment Monitoring	
				Plan	Period	Indicator & methode	Period
				provide them with fit training			
11	Biodiversity of Flora & Fauna	- Land Clearing	Villages around company	**Technology approach**: Protection of flora & fauna on the area with good condition of ecology - Put the information boards for prohibition illegal logging of protected species of flora (especially on riparian area and area near the protected forest) and illegal hunting. - planting and maintaining the ecological functioning types of vegetation for the existing animals, so as they have space for feeding, covering, and breeding **Socio-economic approach**: - Socialization to the community about biodiversity of flora & fauna surrounding the operational area - A persuasive approach to the community not to do the activities that cause the loss of protected flora & fauna and have an ecological function, in the plantation area, riparian area and near to protected forest **Institutional approach**: - Involving the related agencies, in efforts to protect and preserve the protected flora & fauna around the operational area	Once per 3 months, continuous intensively when its needed	- Biodiversity index of flora and fauna - Disruption to protected flora and fauna **Methods**: field survey	Once per 3 months, or continuous intensively when needed
	Biodiversity of aquatic biota	- Land clearing - POME Aplication	In the area arround the river. (Villagers in the operational area with the direct impact)	**Technology approach**: - Preventing an increase in the concentration of suspended solids in water bodies - Water quality test for aquatic biota - Water conservation	Once per 3 months when dry season and onec per 6 months per rainy season	Biodiversity index of aquatic biota **Methods**: water testing of aquatoc biota	Once per year

- **HCV management & mitigation plan**

The HCV development and preparation of management & monitoring plans was based on the result of the HCV assessment which was administered in June 2016 by independent consultants from Aksenta who has been accredited and approved by ALS HCVRN. This process provides data and information related to the presence of the HCV areas in the plantation permitted area (IUP) of PT GMS, the key HCV elements, the actual conditions included the potential threats, and the recommendations for the management. Whereas, HCV management plan has developed by dissemination or consultation public and involving stakeholder. Dissemination of HCV management plan has carried out dated on 16-17 December 2016 and 26-27 April 2017. HCV areas in PT GMS include of fauna corridor on Bumitama Biodiversity & Community Project (BBCP). Whereas, Village level landuse planning (VLLP) has carried out in Simpang Tiga Semblangan Village & Tanjung Medan Village.

The HCV development and preparation of management & monitoring plans was implemented with the aim to provide guideline for the company in planning and management of its programs or activities in managing the HCV present within the concession area. The purpose was to enable all the available resources to be focused, integrated and effective in order to achieve the HCV management outcome. The purposes of this management and monitoring document were:

1) To ensure that the identified and assigned HCV areas are under protection and in a well managed state so that their HCV functions are well preserved,
2) To enhance the administration of the management and monitoring in the sense that the process carried out is in accordance the legal and legislative requirement and in line with the Sustainability Policy of the company.

Management PT GMS has determined the HCV area to be manage base on it Plantation Permit (± 5,190 ha) around 1,273.8 ha. The basic programs and activities that fulfill the HCV management are monitored and review regularly. The purpose of review is to measure the achievements, effectiveness, efficiencies, impacts, and sustainability of the programs. Thus, the purpose of monitoring is to evaluate whether the activities are running as they are expected; whether the outputs of the process are as they were projected previously; and whether the resources investments (human, fund, time) are as they were planned.

Monitoring and review are aimed to a set of indicators as the key performance indicators and should be managed systematically, consistently, and are well documented. The monitoring should be implemented regularly and it is dependent on the classifications of the activities and the target indicator to evaluate. The review should be conducted at the end of the management periodical plan, that is in the end of the third year (summative review) and every six months (formative review).

Table 23. The threat assessment for identified HCV:

What happens now / pressure	Potential Threat	Causes/ Sources (contribute possibility to the pressure)	Note
HCV 1			
Decreasing the number of species and the number of RTE species (orangutan)	High	• Area and quality of wildlife habitat decreases • Animals connectivity disconnected	Corridor area at eastern of Gunung Tarak Protected Forest, northern of Gunung Palung National Park and production forest area in the south of PT GMS.
Animal hunting (deer)	High	• Illegal hunting by local peoples and migrants workers	Deer hunting activity was found in Bukit Rungau
Land and forest fires	Very High	• Un-control land clearance for farmlands	It was happened at watershed of Selinsing River and around boundaries area of PT GMS
HCV 3			
Reduced peat swamp forest cover is still in good condition	High	• Illegal logging • Boundaries of HCV area in un-clear or un-known by contractor of land clearing	It was faound in the southern of nursery area II
HCV 4			
Water quality reduction	High	• Agrochemicals application at the riparian area with oil palm plants • Morpho-erosion or landslides riverbanks causing sedimentation in water bodies	Especially at Selinsing River, Raya River and Pelaik Hitam River

What happens now / pressure	Potential Threat	Causes/ Sources (contribute possibility to the pressure)	Note
Land conversion at riparian area	High	• Boundaries of HCV area in un-clear or un-known by contractor of land clearing • Local people's perception that the riparian area is not open is the company's concession area	Especially at riparian area which still have natural vegetation: Tolak River, downstream of Selinsing and Raya River
Land subsidence	High	• Drainage in peat area	Outlet trenches from the dams at nursery area II
HCV 5			
Loss of agroforestry area	High	• Plantation development, especially when land clearance area	Was found in foothills of Rungau and Natai Tumbang Limat
HCV 6			
Loss of sacred area/ religious building	Low	• Plantation development, especially when land clearance area	Company has conserve the sacred area at Rungau Hill; whereas the scared area at Butak Hill has already identified and in participatory mapping process by the company.

Table 24. Summary of Management and Mitigation Plans on HCV

Criteria of HCV	Threat	Management Plan	Monitoring Plan
1 & 3	• Illegal Hunting by surrounding community • Timber utilization by surrounding community • Land and forest fires	• Determination the boundaries of HCV area based on mapping area and Socialization of rear, threatened and endangered protected species to all staff, contractor and surrounding community • Ensure that no illegal hunt of rear, threatened and endangered species by all stakeholders • Reforestation & rehabilitation on identified & defined of HCV Area • Socialization of land clearing without burning • Socilaization of the HCV Area, Coordination and work with community • Fire prevention programs, form and train fire fighting team • Inventory of animals to check wildlife populations progress periodically • Build agreements with stakeholders, especially local communities, about the type of rare fauna / protected utilized by local communities	• Carried out the patrol & monitoring against ilegal logging and hunting • Intensity of interference to HCV area, including fire hazard • Actual implementation of activities and the survival of rehabilitated land cover • Fires patrol, especialy in dry season (June – October), work with villagers, local government.
4	Pollution residue from the application of chemicals (fertilizers, herbicides and pesticides) in rivers around PT GMS	• Restrictions on the application of fertilizer and the use of herbicides and pesticides in the HCV area • Put of the sign board for the restriction or prohibition of the use of chemicals in the riparian/ HCV Area • Socialization to the workers	• Water quality testing in water monitoring point periodically, once every 6 months (visually and laboratory testing)
	Sedimentation from land and river bank erotion	• Strengthening the landslide-prone riverbanks with technical civil approach • Vegetation enrichment on the riparian of the river, Selinsing River, Raya River & Pelaik Hitam River, especially with the local plant or plant that have deep and strong roots and thick	• Sedimentation rate • number of landslides locations or high attrition
	Land subsidence	• No longer do the drainage of peat area • Retain water level in the peat areas which already has a trenches (a minimum 60 cm from the land surface)	• Monitoring of peat water level periodically
5 & 6	Activity and plantation operational that has less attention and appreciate against the HCV 5 and 6 area, especially during land clearance	• Socialization about HCV 5 & 6 area (location, forms and importance), as well as company's commitment to preserve it. Especially to land clearing contractor, workers and community • Put the signboard/ information board with sacred place' name and HCV 5 & 6 contained in • Make an agreement with the community/ the heiress, related to technical and management rules of HCV 6 (including any matters that should not be done related to	• Land clearance monitoring • Monitor the existence and physical condition of the area HCV 5 & 6 • Evaluate the effectiveness of the management HCV 5 and 6 areas

Criteria of HCV	Threat	Management Plan	Monitoring Plan
		the preservation of HCV 6) • Provide an access for people who want to do activities in the area HCV 5 and 6	

To carry out management of HCV areas that the company should colaboration with communities and other company around PT GMS areas. HCV management plan regarding state of HCV areas, socialization and involving community in manage of HCV areas and capacity building below :

State of HCV areas	Socialization and involving community in manage fo HCV areas	Capacity building
• To conduct delineation of HCV map and verified so that should state of HCV areas on map of indicative HCV areas. • Develop of boundary pillar • Develop of signboard on HCV areas	• Internal of company (field employee, officer & community at estate) • Community around PT GMS areas • Local governemt • Neighbour company • Internal perusahaan (karyawan lapang, staf dan warga kebun)	• Monitoring of HCV areas training • Implement of SOP and policy relate of monitoring of HCV areas by consistent

- **Elements to be included for soil analysis**

PT GMS has a Standard Operating Procedure (SOP) for the Management for Soil and Water. Based on the SOP, management for planting on mineral soil are follows :

- Cover crops planting
- Applications of empty bunches
- Midrib forms
- Ditch conservation/ rorak

Based on Bumitama sustainability policy that the histosol areas (peatland) will be managed and conserved.

- **Elements to be included for carbon stocks and GHG emissions**

1. **Steps to Manage and Increase the Carbon Stock**

a. Land Use Change / New Planting

Land conversion appeared as the largest emission factor contributing to 12,961.53 tCO_2e

Target	:	Reduction of emissions from land clearing activities
Action Plan	:	‣ No land clearing of HCV, HCS and peat areas ‣ Management plan of conservation areas ‣ Development of fire mitigation and completion of fire fighting equipment

b. Carbon Crop Sequestration

Carbon crop Sequestration appeared as the largest reducing emission factor contributing to -32,782.91 tCO2e

Target	:	Incease of carbon crop sequestration
Action Plan	:	‣ Use of seeds with high production potential ‣ Use of land cover crops

c. Fertiliser

Fertiliser manufacturing and emisions from aplication of fertiliser emission factor contributing to 2,141.43 tCO2e

Target	:	Emission reduction from fertilising

Action Plan	:	‣ Leaf & soil analysis to obtain the data of optimal amounts of fertiliser applied; ‣ Empty bunch used for mulching ‣ Fertilisers application thechnique based on topography

d. Diesel Consumption in Operation

Fuel Consumption in the field contributed to 1,202.54 tCO_2e

Target	:	Reduction of emission from Diesel Consumption in Operation
Action Plan	:	‣ Good maintenance of vehicles and other equipment, periodically ‣ Safety of driving related training

e. Peat

No clearing of Peat Areas in accordance with Bumitama's Sustainability Policy

Target	:	No clearing of peat areas, water management
Action Plan	:	‣ Peat deliniation & mapping ‣ No clearing of peat areas ‣ Water management of peat areas to make sure there is no decrease in the natural conditions of water table

f. HCV Crop Sequestration

HCV crop Sequestration appeared as the emission reducing to -399.45 tCO2e

Target	:	Incease of carbon sequestration
Action Plan	:	Rehabilitation on the HCV & Peat Areas that are open land or covered with grass

2. Monitoring of the Action Plan implementation

a. Land Use Change/ New Planting

Monitoring of land clearing

Target	:	Reduction of emission from land clearing activities
Action Plan	:	To monitor the plans for land clearing and its realisation

b. Carbon Crop Sequestration

Monitoring carbon crop sequestration

Target	:	Increase of carbon crop sequestration
Action Plan	:	‣ To make sure that seed is good quality and with a government license ‣ To monitor the realisation of oil palm planting & legume cover crops ‣ To minimise FFB losses

c. Fertiliser

Monitoring fertiliser emissions

Target	:	Reduction of emissions from fertiliser activity
Action Plan	:	‣ To monitor leaf and soil analysis activity ‣ To monitor empty bunch application for mulching ‣ To monitor plan and realisation of fertiliser application

d. Diesel Consumption for Transport

Monitoring fuel consumption in the operational activity

Target	:	Reduction of fuel emissions from operational activities
Action Plan	:	‣ To monitor the fuel consumption of each device and vehicle ‣ To analyse work of equipment compared to its fuel consumption ‣ To monitor planning & realisation of training related with driving safety

e. Peat

Monitoring peat areas and water management

Target	:	There is no land clearing in peat areas, best management practices in water management.
Action Plan	:	‣ To monitor planning of land clearing ‣ To monitor water table periodically ‣ To monitor subsidence of peat surface

f. HCV Crop Sequestration

Monitoring carbon sequestration of the HCV & Peat Areas

Target	:	Increase of carbon sequestration
Action Plan	:	‣ To monitor the planning and realisation of HCV & Peat areas rehabilitation, where the land cover is grassland or open land.

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- HCV report has evaluated by HCV-RN (25 October 2016)
- AMDAL/EIA document (KA-ANDAL, ANDAL & RKL/RPL document)
- Calculating and mitigation of GHG emission, June 2016
- HCS approach assessment report, February 2016
- LUCA report, January 2017
- SIA report, March 2016

Internal Responsibility

This document is the summary of assessment result on Environment Impact Aseessment (EIA), Social Impact Assessment (SIA), High Conservation Value (HCV), Land Use Change Analysis (LUCA) and High Carbon Stock (HCS) in PT GMS – District of Ketapang, West Kalimantan Province and has been approved by the Management of PT GMS

Gagas Dinamiga Aksenta,

Resit Sözer
Team Leader HCV & SIA
Date: 31 October 2016

Nandang Mulyana
(ALS : 15037NM)
Date: 31 October 2016

Management
PT GMS,

Eko Budhi Purnomo
Region Head of PT GMS
Date: 31 October 2016

Assessments result document of PT GMS by Gagas Dinamiga Aksenta (Aksenta), will be applied as one of the guidelines in managing oil palm plantation in PT GMS

Management
PT GMS,

Eko Budhi Purnomo
Region Head of PT GMS
Date: 31 October 2016

Document of Management Plans of Assessment,
has been proposed and approved by the Management of PT Gemilang Makmur Subur.

Management
PT Gemilang Makmur Subur

Lim Sian Choo
Head of Corp. Sustainability &
Corporate Social Responsiblity
Date: 31 October 2016

Eko Budhi Purnomo
Regional Head

Date: 31 October 2016

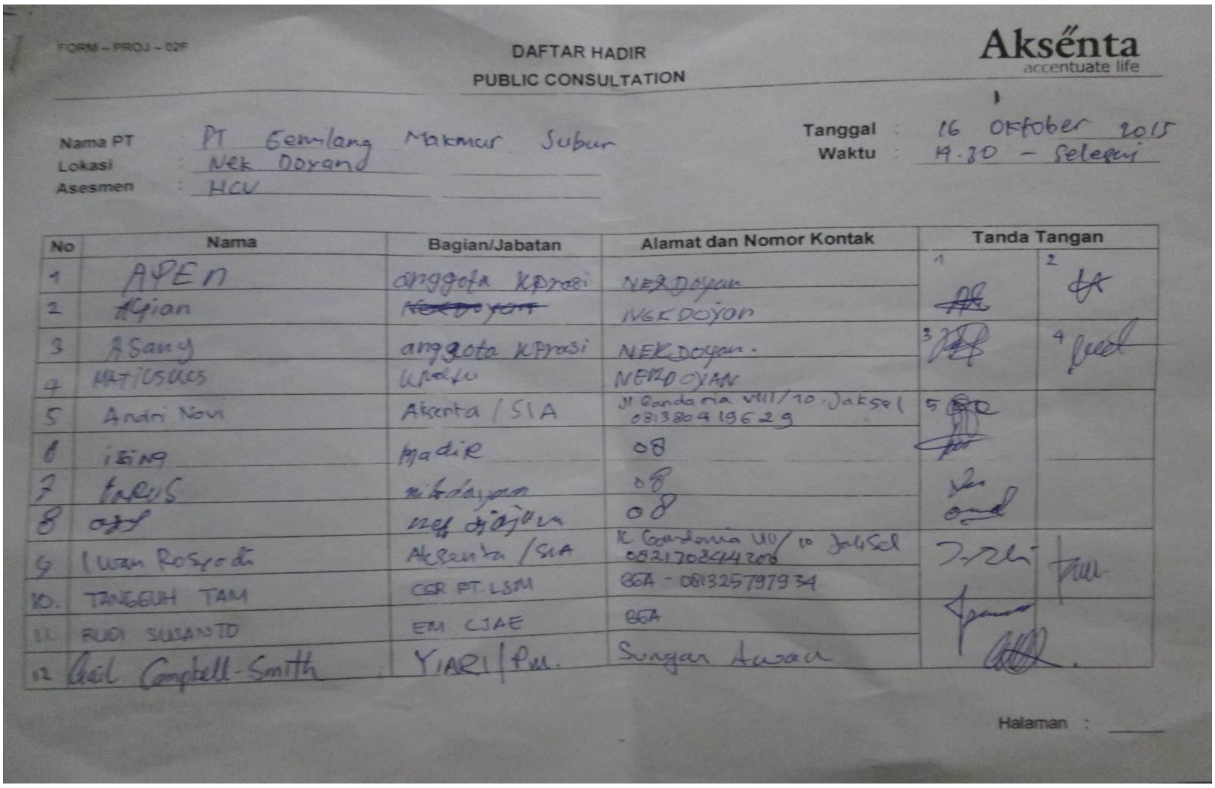
Appendix 1. List of prevailing applicable regulations and some supporting guidelines which used as references in the identification process of HCV and SIA study

NO	List / Type of Reference	Details
1.	Status of vulnerability according to the World Conservation Union (IUCN), 2009	CR : Critically Endagerd EN : Endangered VU : Vulnerable NT : Near threatened
2.	Status in terms of trade of world's wild fauna and flora (CITES), 2009	App. I : list of all plants species and animals which are prohibited to be internationally traded by any means. App. II : list of species that trading required rules to diminish the threats of extinction.
3.	RI State Legislation (Acts)	
	1931 *Dierenbeschermings Ordinance* (Wild Animals	Wildlife protection
	1970 Decree of Minister of Agriculture, No. 421/Kpts/Um/8/1970	Wildlife protection
	1973 Decree of Minister of Agriculture, no 66/Kpts /Um / 2 / 1973	Wildlife protection
	1977 Decree of Minister of Agriculture, No. 90/Kpts/Um/2/1977	Wildlife protection
	1978 Decree of Minister of Agriculture, No. 327 / Kpts/Um/5/1978	Wildlife protection
	1979 Decree of Minister of Agriculture No. 247 / Kpts/Um/4/1979	Wildlife protection
	1980 Decree of Minister of Agriculture, No. 716 / Kpts/Um/10/1980	Wildlife protection
	1999 Government Regulation No. 7 of 1999	Wildlife protection
	Government Regulation, PU 63/1993 PU	Determination width of the river
4.	Map of TGHK (Forest Land Use Agreement) and government's official documents concerning the appointment status of forest areas	To determine the status of an area whether or not in the protected areas

Appendix 2. List of stakeholder involved

NO	Name	Information	Ethnic
1.	Amir Hamzah	Staff of BGA	-
2.	Putra Malau	Staff of BGA	Batak
3.	Tangguh	Staff of GMS	-
4.	Asep	Staff of GMS	Sunda
5.	Onjol	Local people	Dayak
6.	Supratman	Staff of GMS	Bengkulu
7.	Latif	Staff of GMS (GIS Dept)	Melayu
8.	Karus	People of Nek Doyan	Melayu
9.	Rabuan	Traditional leader of Nek Doyan (Ketua Demung Adat)	Dayak Tolak Sekayu
10.	Jumain	People of Nek Doyan	Melayu
11.	Sumardi	Staff of GMS (CSR Dept)	Melayu
12.	Dul Hadi	Head of Nek Doyan Hamlet	Melayu
13.	Tirai Sudirman	Local people	Dayak
14.	Samin	Local people	Dayak
15.	Suwarto	Local people	Jawa
16.	Sudirman	Local people	Melayu
17.	Solihin	Local people	Melayu
18.	Rudiansyah	Local people	Melayu
19.	Isomad	Local people	Dayak Tolak Sekayu
20.	Junaidi	Local people	Melayu
21.	Roni	Local people	Dayak Tolak Sekayu
22.	Lian Ho	RT 11	Cina
23.	Nasius Efendi	RT 9	Dayak Tolak Sekayu
24.	Riadi	RT 12	Melayu
25.	Matius Akun	Local people	Dayak Tolak Sekayu
26.	Georgius Unan	Local people	Dayak Tolak Sekayu
27.	Saud	Local people	Melayu
28.	Tajoni	Local people	Melayu
29.	Asang	Local people	Melayu
30.	Ising	Ex of Demung Aek Doyan	Dayak Tolak Sekayu
31.	Jumain	Local people	Dayak Tolak Sekayu

Appendix 3. Stakeholder consultation on HCV Assessment



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DAFTAR HADIR
PUBLIC CONSULTATION

Aksenta accentuate life

Nama PT : PT Gemilang Makmur Subur
Lokasi : Nek Doyan
Asesmen : HCV

Tanggal : 16 Oktober 2015
Waktu : 19.30 – Selesai

No	Nama	Bagian/Jabatan	Alamat dan Nomor Kontak	Tanda Tangan
1	APEN	anggota KPrasi	NEK Doyan	[signature]
2	Agian	~~Nek Doyan~~	NEK DOYON	[signature]
3	Asany	anggota KPrasi	NEK Doyan.	[signature]
4	[illegible]	Warga	NEK DOYAN	[signature]
5	Andri Novi	Aksenta / SIA	Jl Gandaria VIII/10 Jaksel 081380419629	[signature]
6	ising	Madir	08	[signature]
7	[illegible]	[illegible]	08	[signature]
8	[illegible]	ney doyan	08	[signature]
9	Iwan Rosyadi	Aksenta / SIA	Jl Gandaria VIII/10 Jaksel 082170844320	[signature]
10	TANGGUH TAM	CSR PT. LSM	BGA - 081325797934	[signature]
11	RUDI SUSANTO	EM CJAE	BGA	[signature]
12	Gail Campbell-Smith	YIARI / Pm.	Sungai Awan	[signature]

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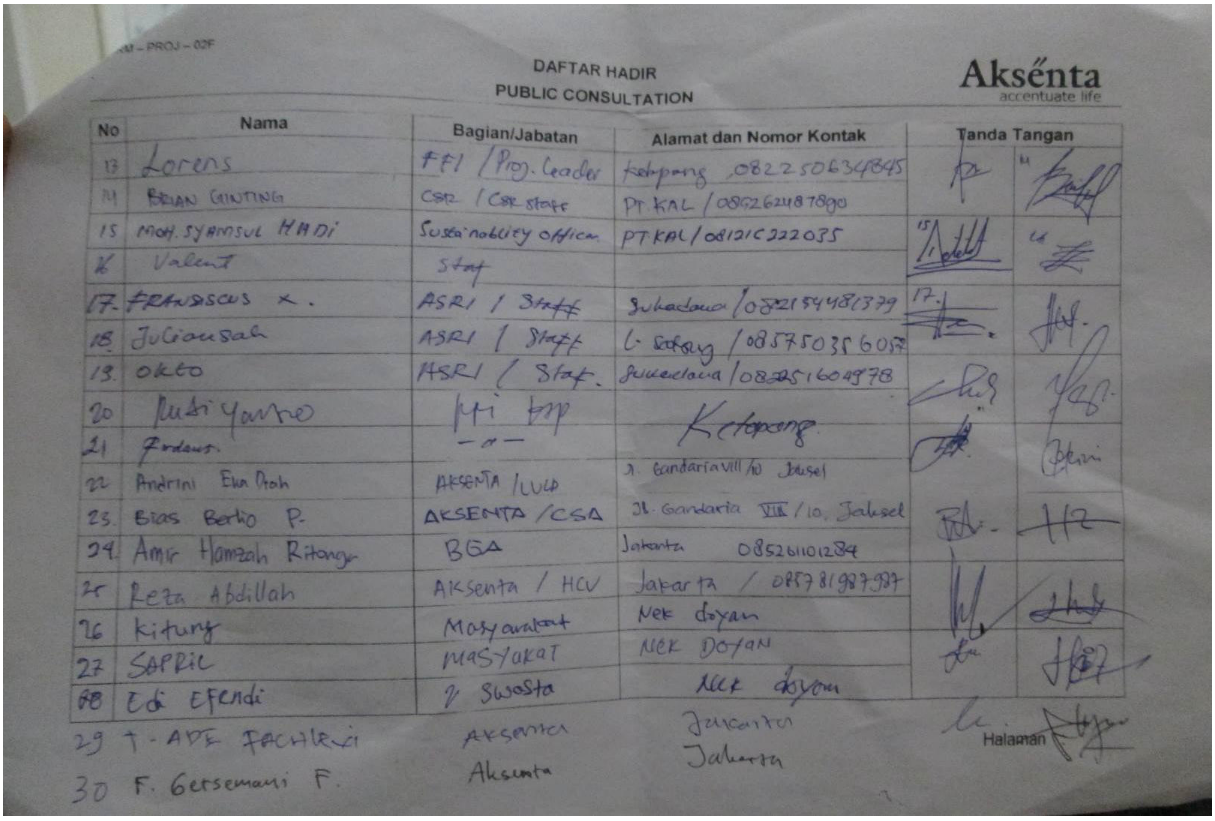

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DAFTAR HADIR
PUBLIC CONSULTATION

Aksenta accentuate life

No	Nama	Bagian/Jabatan	Alamat dan Nomor Kontak	Tanda Tangan
13	Lorens	FFI / Proj. Leader	Ketapang 082250634845	[signature]
14	BRIAN GINTING	CSR / CSR staff	PT KAL / 085262487890	[signature]
15	MOH. SYAMSUL HADI	Sustainability officer	PT KAL / 08121C222035	[signature]
16	Valent	Staf		[signature]
17	FRANSISCUS X.	ASRI / Staff	Sukadana / 082154481379	[signature]
18	Juliansah	ASRI / Staff	L. Sekong / 085750356057	[signature]
19	okto	ASRI / Staf.	Sukadana / 085251604978	[signature]
20	Sutriyanto	[illegible]	Ketapang	[signature]
21	Firdaus	– " –		[signature]
22	Andrini Eka Ptoh	AKSENTA / LUCA	Jl. Gandaria VIII/10 Jaksel	[signature]
23	Bias Berlio P.	AKSENTA / CSA	Jl. Gandaria VIII/10 Jaksel	[signature]
24	Amir Hamzah Ritonga	BGA	Jakarta 085261101284	[signature]
25	Reza Abdillah	Aksenta / HCV	Jakarta / 085781987987	[signature]
26	Kitung	Masyarakat	Nek doyan	[signature]
27	SAPRIL	MASYAKAT	NEK DOYAN	[signature]
28	Edi Efendi	// Swasta	Nek doyan	[signature]
29	T. ADE FACHLEVI	AKSENTA	Jakarta	[signature]
30	F. Getsemani F.	Aksenta	Jakarta	[signature]

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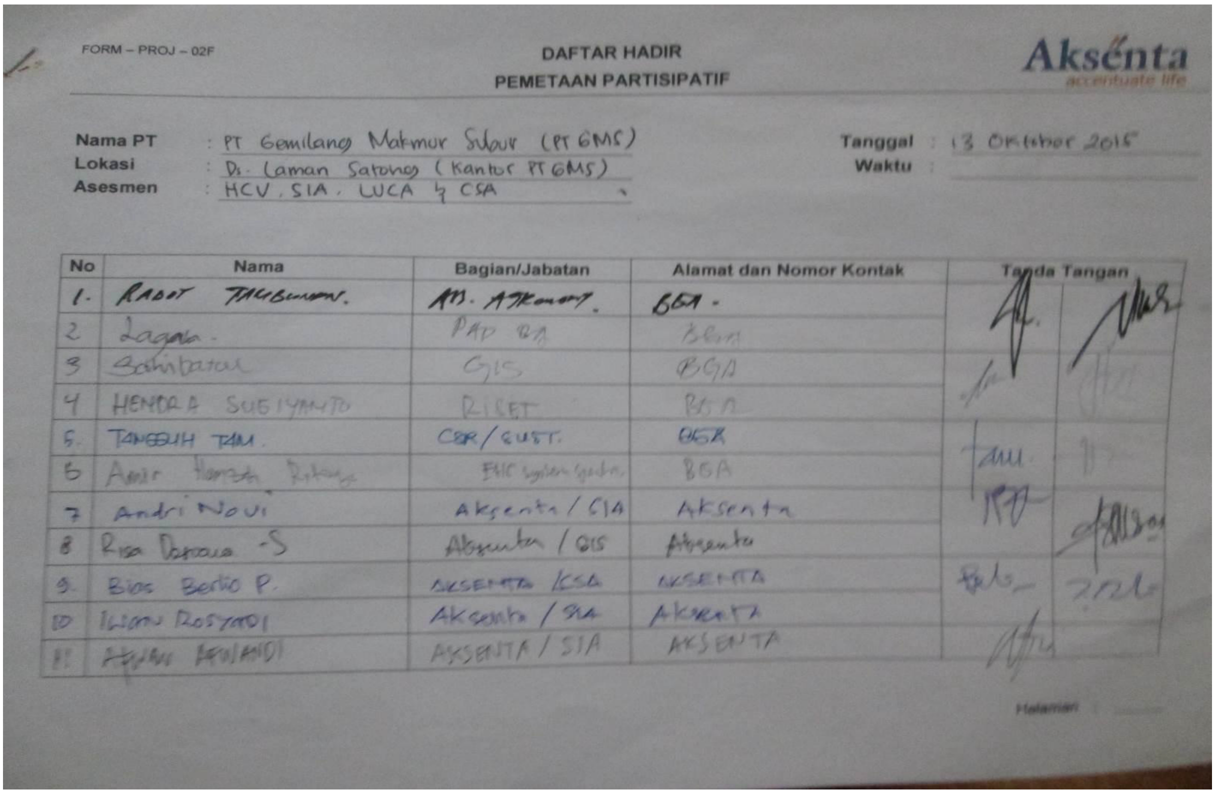
Appendix 4. Participatory Mapping on HCV Assessment



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DAFTAR HADIR
PEMETAAN PARTISIPATIF

Aksenta
accentuate life

Nama PT : PT Gemilang Makmur Subur (PT GMS)
Lokasi : Ds. Laman Satong (Kantor PT GMS)
Asesmen : HCV, SIA, LUCA & CSA

Tanggal : 13 Oktober 2015
Waktu :

No	Nama	Bagian/Jabatan	Alamat dan Nomor Kontak	Tanda Tangan
1.	Radot Tambunan.	Ast. Atkomot.	BGA.	
2	Lagala.	PAP BA	BGA	
3	Sahibatal	GIS	BGA	
4	Hendra Sugiyanto	Riset	BGA	
5.	Tangguh Tam.	CSR/Sust.	BGA	
6	Amir Hamzah Ritonga	[illegible]	BGA	
7	Andri Novi	Aksenta / SIA	Aksenta	
8	Risa Daraua S	Aksenta / GIS	Aksenta	
9.	Bios Bertio P.	Aksenta / CSA	Aksenta	
10	Ilham Rosyadi	Aksenta / SIA	Aksenta	
11	Afwan Arwandi	Aksenta / SIA	Aksenta	

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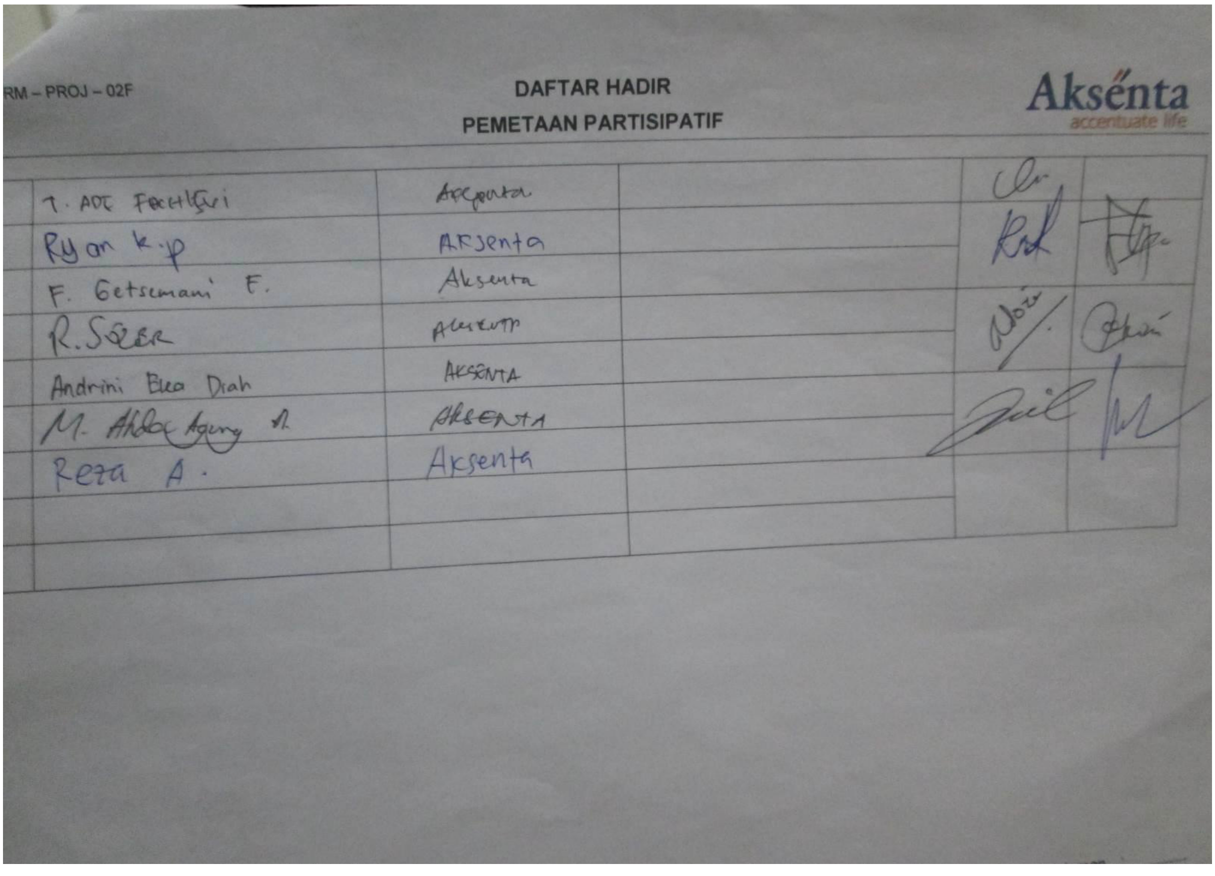

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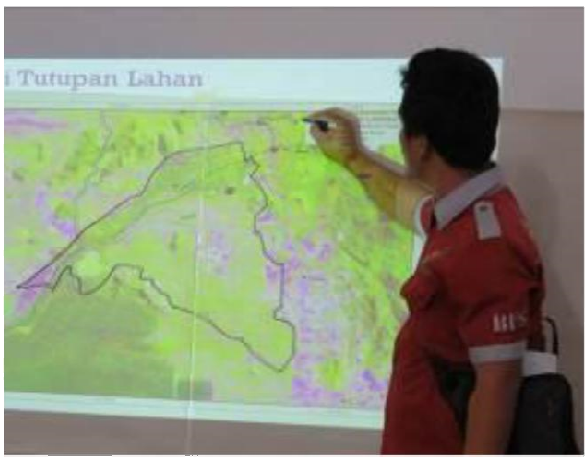
DAFTAR HADIR
PEMETAAN PARTISIPATIF

Aksenta
accentuate life

1. Ade Fachrozi	Aksenta			
Ryan K.P	Aksenta			
F. Getsemani F.	Aksenta			
R. Saer	Aksenta			
Andrini Eka Diah	Aksenta			
M. Ahdar Agung A	Aksenta			
Reza A.	Aksenta			

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