Roundtable on Sustainable Palm Oil

New Planting Procedure

Summary Report and Management Plans

PT Karya Makmur Abadi

East Kotawaringin Regency

West Kalimantan Province

Indonesia

Prepared by :

PT Karya Makmur Abadi

2017

1. Overview and Background

1.1. Social Environmental Impact Assessment

The summary of SEIA is extracted from the report of social impact assessment (SIA) for social aspects and from document of environmental management and monitoring for biological and physical aspects. Together the two documents considerably constitute the elements of SEIA.

Mankind has been positively affected by the current ongoing economic developments. However, the current ongoing economic developments at the same time have also created negative externalities toward both mankind and natural resources. Therefore, in order to sustain the current ongoing economic developments, negative externalities must be minimized while positive benefits are maximized.

Oil palm industry is one of the many industries that must put effort into balancing economic goals and ecological and social values. Failure to do so will result in halted operation, which will result in unnecessary costs.

PT Karya Makmur Abadi is one of many companies in oil palm industry that has suffered many operational problems due to unmanaged social risks and issues. Majority of those problems were due to the presence and operational activities of PT KMA.

Within palm industry, Social Impact Assessment is intended to assist companies with palm plantation and palm oil factory to recognize social impacts, social issues, and social risks that will be met. Results from SIA will be the foundation to prepare company social management plan. Company social management plan must include well developed strategies, initiatives, and programs for the purpose of (i) mitigating negative social impacts from the existence and operational activities of the company, (ii) strengthening positive social impacts of the company, (iii) mitigating company social risks, and (iv) developing company social roles to contribute toward company's surrounding communities and area development.

There are 8 principles and 39 criteria in RSPO Principle and Criteria. Conducting SIA and constructing social management plan, and then followed by implementing impact and social issue programs are part of requirements to be RSPO certified.

The study area of this Social Impact Assessment was the central and southern parts of operational area of PT Karya Makmur Abadi and its surroundings. The study area is located in Mentaya Hulu district of Kotawaringin Timur Regency. **Figure 1** is the map of the study area.

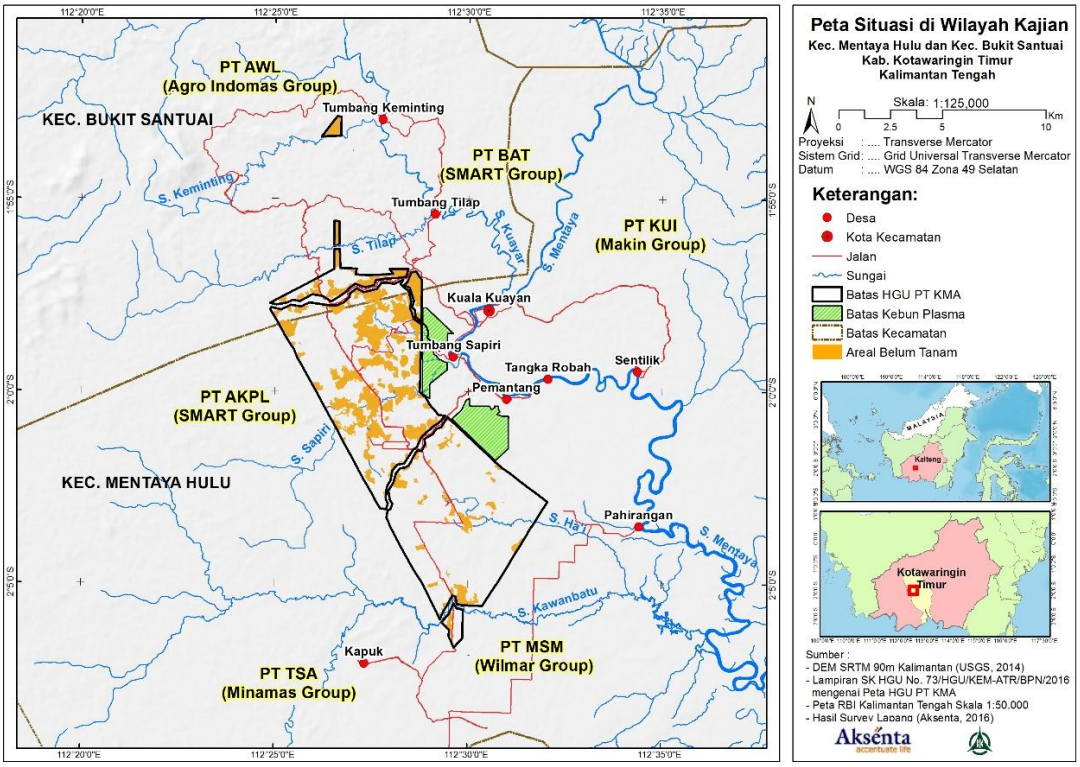


Figure 1. Map of the study area

1.2. Review and Update on HCV Management and Monitoring Area

Reviewing and updating HCV management and monitoring areas was conducted in August 2016. The purpose of this activity was to check and evaluate the status of previously identified HCV areas in year 2010. Additionally, this activity was also conducted to evaluate the management and monitoring of the aforementioned identified HCV areas.

This evaluation will provide recommendation for adaptive management and conservation plan. Conservation plan is mitigating or compensating over the loss or reduction in HCV areas or the reduction in the quality and quantity of HCV areas if necessary.

HCV assessment conducted in year 2010 at PT KMA used the total area under location permit as the study area or 15,500 ha. This review and updating activity, however, used total concession area as the study area. Thus, the total size of area studied for reviewing and updating HCV management and monitoring areas is 9,397.1 ha. **Figure 2** is the map of the study area.

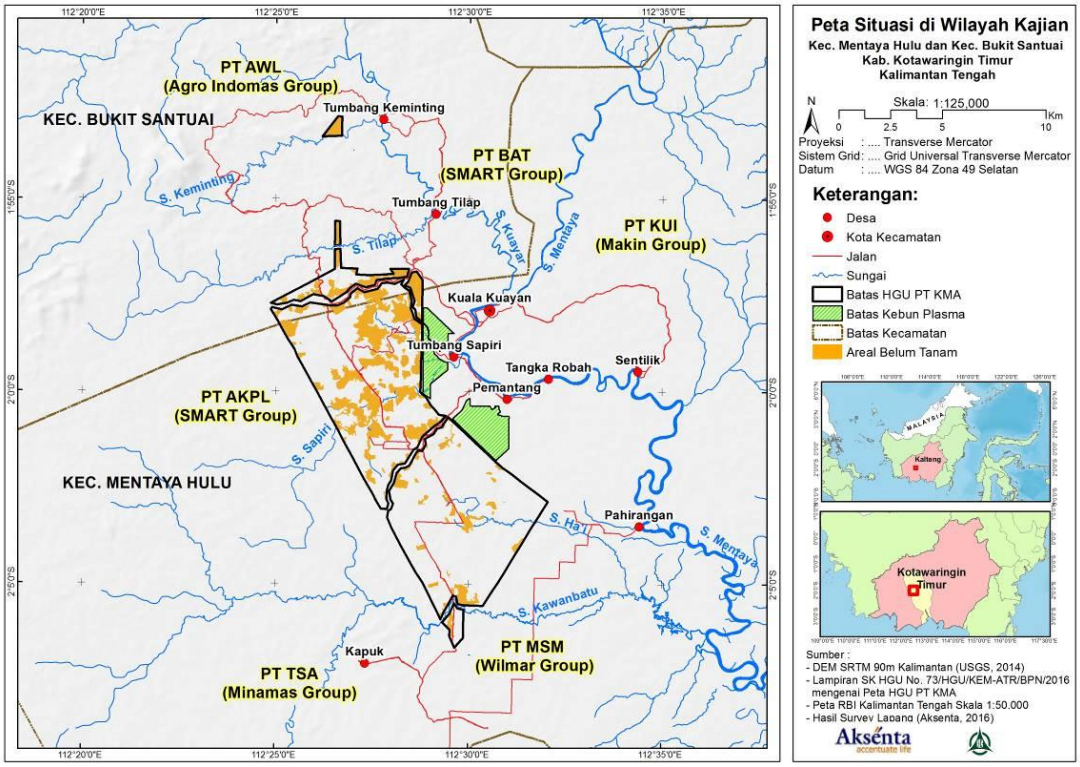


Figure 2. Map of the study area

There was no land clearing conducted in year 2010 and there were wildlife, including Orang Utan, in the area. The area consisted of young shrubs and several small fragments of forest.

1.3. Soil and Topography

it was found that about 381 Ha (9%) of soils in South Estate considered as fragile/marginal soils, while none for soils in Central Estate. Around 99% of land in Central Estate is classified as marginally suitable.

As for fragile-marginal soils in South Estate, only about 35 Ha were fragile, consisting of Berhala 24 Ha (5%), Plan 9 Ha(2%), and Peat-hemists 2 Ha (<1%).

1.4. Carbon stock assessment and GHG emissions

Carbon Stock Assessment

One of greenhouse gases that is important and has contributed in climate change is Carbon Dioxide (CO_2). Land cover change and fossil fuel usage have contributed around half of total CO_2

emission into the atmosphere. Accumulation of greenhouse gas due to land cover change is estimated to have reached 20% from total global emission (Manuri et al., 2011).[1]

This greenhouse gas aspect has received attention from all business units in palm plantation. As such, they have been developing best management practice to reduce every negative impact and to also enhance existing environment value while increasing productivity in palm plantation.

In RSPO 7.8, development of new plantation must be designed to minimize net greenhouse gas emission. Guidance to minimize greenhouse gas emission stated in ISPO 3.6 requires every development and management of palm plantation to calculate carbon stock and identify greenhouse gas emission sources. Results from calculation and identification are used as baseline value to measure the success of plantation management in minimizing greenhouse gas emissions. Therefore, every palm plantation that is a member of RSPO must have plan to minimize net greenhouse gas emission by avoiding lands with high carbon stock when opening new plantation.

Carbon stock assessment in development plan area of PT. Karya Makmur Abadi is intended as part of fulfilling the requirements in RSPO 7.8 and ISPO 3.6.

The study area 9,397.1 ha, as the Utilization Right (HGU), includes unplanted area of size 1,727 ha. **Figure 3** is the map of the study area.

[1] Manuri. S.. C.A.S. Putra dan A.D. Saputra. 2011. Tehnik Pendugaan Cadangan Karbon Hutan. Merang REDD Pilot Project. German International Cooperation – GIZ. Palembang

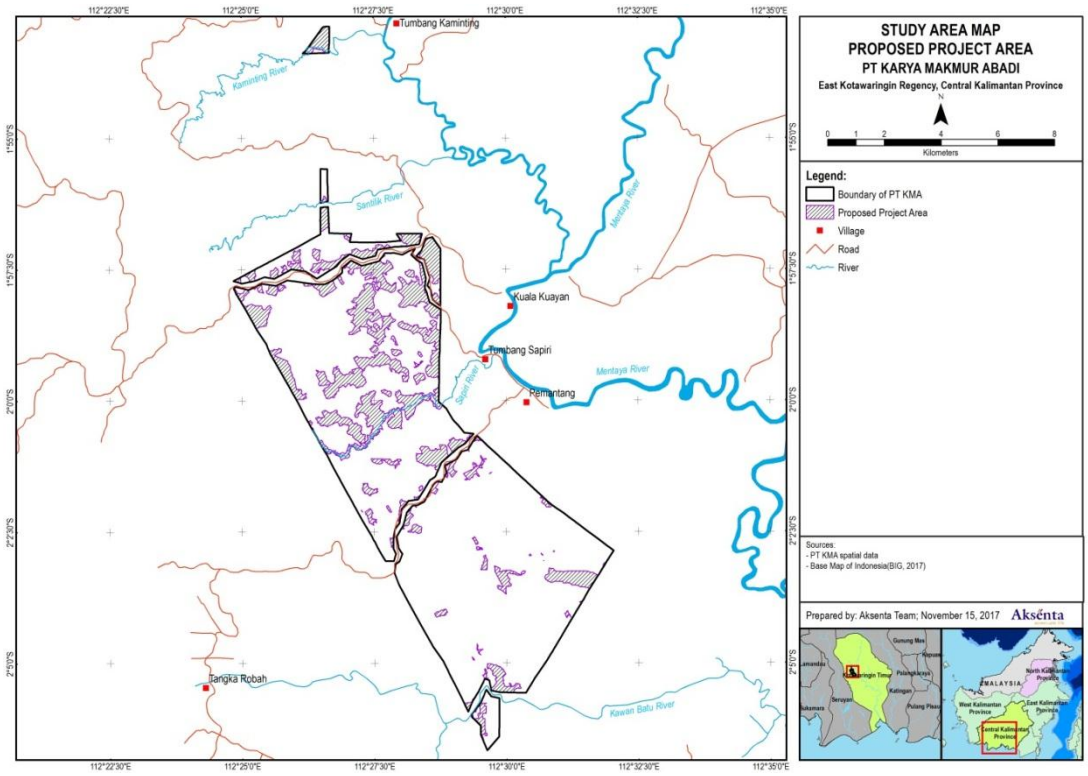


Figure 3. CSA study area map

GHG Emissions

Greenhouse gas (GHG) emission caused by human activities have become the center of attention so that the amount of greenhouse gas in the atmosphere will not endanger nature and humans. Planning, managing, monitoring, and evaluating every aspect of human activities causing GHG emission are very important to be conducted.

Agriculture sector, which includes palm industry, is one of human activities that emits GHG. RSPO through Principle and Criteria 7.8 attempts to minimize GHG emission resulted from developing new plantations. This Principle and Criteria is also one of the components that must be fulfilled in New Planting Procedure of RSPO. As a guidance in minimizing GHG emission, RSPO also has issued an instrument to calculate emission projection from one management cycle (25 years) of a new palm plantation. The instrument is called RSPO New Development Greenhouse Gas Calculator.

PT KMA, as a member of RSPO, has appointed Aksenta to conduct GHG emission assessment in order to fulfill the requirements on New Planting Procedure. The size of area for new planting is 1,727 ha of the 9,397.1 ha Utilization Right (HGU), which is geographically located at $2^0$38’02.06”-$2^0$42’28.63” South latitute - $110^0$55’39.12”-$111^0$03’57.39” East longitude.

1.5. LUC Analysis

Referring to Principle and Criteria of RSPO and as a member of RSPO, every palm plantation companies is required to conduct HCV assessment in its operational area prior to land clearing effective from November 2005. After November 2005, HCV areas identified in a member's operational area cannot be developed into palm plantation.

Many members of RSPO, however, have done land clearing without conducting HCV assessment after November 2005, thus as a member of RSPO those companies have not fulfilled Criteria 7.3. Those members do not intentionally ignore Criteria 7.3 due to several factors such as: (i) From November 2005 to November 2007, Principle and Criteria RSPO was still in trial stage to be implemented, (ii) National Interpretation on requirements of Principle and Criteria RSPO was still being prepared (as an example, National Interpretation of Principle and Criteria RSPO for Indonesia was completed on May 2008), (iii) HCV assessment guidance is not yet readily available, (iv) qualified HCV assessors were still rare, and (v) there are palm plantation being purchased by RSPO members from non-RSPO members.

To prevent more land clearings without first having HCV assessment being conducted, RSPO issued New Planting Procedure in December 2009 and took effect in January 2013. One of its requirements is for RSPO members to conduct HCV assessment prior to starting land clearing activities. To ensure that RSPO members whom have violated Criteria 7.3 can still be RSPO certified, RSPO Remediation and Compensation Procedures are issued in May 2014.

There are 3 main requirements that must be done by RSPO members whom have violated Criteria 7.3 as given by RSPO Remediation and Compensation Procedures. Those are:

1) Admittance to RSPO that land clearing has been conducted without regard to Criteria 7.3 (disclosure of non-compliant land clearing)
2) Conduct Land Use Change Analysis and liability assessment
3) Development of remediation and compensation proposals

PT. Karya Makmur Abadi, as one of RSPO members, has conducted land clearing without first conducting HCV assessment. To fulfill RSPO Remediation and Compensation Procedures, PT. KMA has requested the assistance of Aksenta to conduct Land Use Change Analysis and Compensation Liability Assessment.

In addition, PT KMA has got its legal operational area updated from permit area (Izin Lokasi) to business license area (Hak Guna Usaha) in period between the time LUC Analysis was carried out and the time of submission of the NPP. The update results decrease of the size and change of the shape of its operational area, causing some areas of the permit area are no longer part of the PT KMA operational area. Therefore, in order to correspond the business license area as the up to date legal operational area of PT KMA in the time of submission of NPP, additional LUC Analysis with business license area as the scope of analysis was prepared. However, the

conservation liability identified in the location permit which is later excluded from the business license area, is still counted as the company's responsibility.

1.6. FPIC Process

Oil palm Company whom is a member of RSPO is required to identify areas with high carbon stock within its concession area. Identifying high carbon stock areas is prerequisite before the company conducts land clearing. High carbon stock assessment requires the company to conduct socialization and participatory mapping with the locals using FPIC (free, prior, and informed consent) principles. The principles are intended to protect human rights, livelihoods, customary use lands, and high carbon stock potential areas.

PT Karya Makmur Abadi has developed oil palm plantation on lands previously owned by the local villagers. Those lands, however, have been compensated by the company. Negotiation processes on land usage and compensation between the company and the locals must be ensured that they abide the FPIC principles.

FPIC depicts complete negotiation process between the company and the locals, where the locals have equal standing with the company. The locals have the right to acquire complete information and to freely make decision on their owned lands. Aside enforcing the locals' rights, negotiation using FPIC principles will provide more security and reduce the company's risks.

The purpose of this FPIC assessment is to:

- Complete FPIC document required by HCS Approach assessment.
- Verify whether the process of FPIC has been conducted by the company.
- Ensure the company has provided information based on FPIC elements.

Essentially, important elements of FPIC can be identified as the followings (see UN-REDD Programme, 2013; Colchester, 2010; Forest Peoples Programme, 2008):

(i) ***Free***. The principle is that decision by community over external party proposed plan, either accepted or rejected, is made by the community voluntarily, without force, intimidation or manipulation, duress, persuasion, bribery, gifts or false promises. It includes choosing location, time or duration to take decision.

(ii) ***Prior***. The principle is that decision by community must first be acquired, during early planning of development or investment, prior to giving approval or starting any activities by external party (activity initiator). In the process of acquiring access to land and natural resources, external party (activity initiator) discloses information transparently within a proper allotted time for the community to understand, access, and examine matters related to

activities to be conducted while respecting original and local communities' rights, norms and local cultural law, and obeying permit procedures set by the government/country.

(iii) ***Informed***. The principle is that information given must be clear, accurate, transparent, accessible, in understandable language, objective in presenting the pros and cons and the consequences from agreeing or disagreeing, complete with potential impacts (social, economic, politic, culture, and environment) and impact mitigation, which includes law implication, compensation scheme, and payment offer for every right transfer. This process must reach to communities that are often marginalized (live in remote areas, women, and other marginalized groups). The person communicating the information should have good knowledge of local culture, should be able to choose the right place, should communicate within a proper allotted time to enable the community to understand and cross check, and should communicate in a way that strengthened instead of weakening local culture. In contrast, communities must be given as much chance to communicate land usage system and land management, cultural and religious aspects tied to the land or the existence of sacred and important places for their culture.

(iv) ***Consent***. The principle is that the decision (agreeing or disagreeing) is made collectively by the right and relevant (with land, natural resources, area, and culture) through decision making process practiced by the relevant community. This includes the choice for the community to re-think or change its decision.

2. Assessment Process and Methods

2.1. Social Impact Assessment

The assessment was conducted by two personnel:

1. Andri Novi Hendrarto, whom is the team coordinator, focuses on social culture and social relationship assessment. Contact: andri.novi@aksenta.com
2. T. Ade Fachlevi focuses on community and socio-economic development assessment. Contact: adhe@aksenta.com

Field activities of SIA at PT Karya Makmur Abadi were conducted from August 22, 2016 through August 29, 2016 or in 8 days. Schedule of activities is given in **Table 1.**

Table 1. Timeframe of field activities of SIA at PT Karya Makmur Abadi

Activity	Date	Location
Desk study	August, 18 – 21 2016	Head office of Aksenta (Jakarta)

Activity	Date	Location
Opening meeting, FGD with management, and document study	August 22, 2016	Meeting room at PT KMA
Collecting field funding and conducting FGD with both internal and external parties	August 22 – 28, 2016	6 villages
Closing meeting and interim report	August 29, 2016	Meeting room at PT KMA
Data analysis, mapping of issues, social impacts, and social risks, and making a conclusion	August – October 2016	Head office of Aksenta (Jakarta)
Writing report	October 2015	Head office of Aksenta (Jakarta)

The stages of field activities are as follow:

1. *Opening Meeting*; meeting with the company's representatives, plantation and factory managements. This meeting discusses field activity orientation, socializing social impact assessment, analyses of all parties, drafting a schedule, and field work preparation;
2. *Stakeholders Mapping* and *Field Scoping* to acquire preliminary data on *key stakeholders* according to the perceptions of operation personnel.
3. *Field Observation*; conducted at locations where social issues or impacts have risen or occurred; and, other locations viewed important for finding field facts that indicate changes. Taking photos is also part of field observation;
4. *Indepth Interview*; conducted on company's operation personnel, formal leader figure, informal figure, government officials (village, District, and districts), and community members of various profession and social strata living in the vicinity of the company.
5. *Focus Group Discussion* or FGD; conducted with representatives of all division workers from both plantation and factory.
6. *Document Review*; acquired from available documents in the company and other documents from other trustworthy sources to assist in understanding social and environment contexts;
7. *Closing Meeting*; communicate preliminary findings to the company's management, clarify all findings, request feedback, and provide temporary recommendations.

Conducting Social Impact Assessment in the field follows rules or principles[2] as follow:

1. ***Participatory***; identifying issues and investigating information are conducted by participation. This participatory approach puts all participants as subjects to map

[2] From various sources. See Chamber (1992); Colantonio (2008).

experienced social issues, communicate their opinions and aspirations, and take part in designing management and changes;

2. ***Multi parties***; identifying issues and investigating information are conducted by involving parties whom are either directly or indirectly give and/or receive impact;
3. ***Rapid and Ex-ante***; identifying issues and investigating information are conducted quickly and based on prediction of changes likely to occur using factual data. It is a solution over *Social Impact Assesment*[3] approach limitation and time constraint.
4. ***Appreciative***; identifying issues and investigating information are positively guided not only to know occurring gap, but also to know hopes, potentials, and ideas to find solution over occurring social issues.
5. ***Social-Learning cycle***; social impact assessment is not a linear process with an immediate result, but it is a cyclical process. A process resulted from social learning stages in response to occurring changes in environment.

Key questions used in this Social Impact Assessment are:

1. Which policy, what activity, what management practice and social management are causing changes to the community's pentagon asset, and which component of pentagon asset is changing?
2. Which policy, what activity, what management practice and work are causing positive changes to the pentagon asset? Which component of pentagon asset?
3. Which policy, what activity, what management practice and work are causing negative changes to the pentagon asset? Which component of pentagon asset?
4. What and whichever *pentagon asset* is concluded to experience positive social impact from each social activity/policy/practice/management of the company?
5. What and whichever *pentagon asset* is concluded to experience negative social impact from each social activity, policy, practice, and management of the company?

In this Social Impact Assessment, it is hypothesized that every stage and activity in developing both oil palm plantation and palm oil factory will impact a community's pentagon capital (asset). Plantation development stages and activities start from socialization to carrying fresh fruit bunches. Those stages and activities are suspected to affect *human capital*, *social capital*, f*inancial capital*, *natural capital*, and *physical capital*. *Pentagon Capital*[4] are the fundamental components of sustainability of social livelihood. They are:

1. *Human Capital*; (quality of human resources), elements contained in this components are: ***Health***: include health level, disease prevalence, life expectancy, mother and child mortality rate; ***Education***: include education level, literacy level, school participation rate

[3] Colantonio (2008).
[4] DFID (1999) proposed *Pentagon Capital*.

(rate of quitting school); ***Skill***: include community's general skill, skill of group/certain productive individuals, soft skills; ***Workforce***: include productive age population (age range 18 to 60 years old), workforce availability (stay in own village or migrate), entrepreneurs, social entrepreneurs. For easier understanding in local context, Human Capital becomes quality of human resources. Elements contained have also been adapted to local context.

2. *Social Capital* **(**community cohesiveness**)**; elements included in this component are ***Informal institution***: institution based on custom, religion, ethnicity, kinship (family, clan, family name), economic (cooperative), and interest/hobby.; ***Faith and belief***: include practices of religion, culture, tradition, life values/philosophies that tighten group or all people; ***Communal practices***: include village mutual assistance, social gathering, recitation gathering, service, and sporting activities; ***Norms and rules***, agreed and have been implemented for a long time, include existing or currently practiced both formal and informal social relation dynamics.
3. *Natural Capital* (quality of natural resources); include in this component are: ***Land***: system, pattern, and area of land ownership; system, pattern, and area of land authority; system, pattern, and area of cultivated/utilized land; ***Natural resources livelihoods*** (in the current context, natural resources' utilization history and potential future): natural resources directly utilized from nature (food, shelter, clothing), natural resources cultivated for subsistence, natural resources utilized for source of income; ***Life support natural resources*** (in the current context, natural resources' utilization history and potential future): clean water, forest/plantation as an energy source (firewood), rivers as a transportation infrastructure, forest as a water catchment area, ecosystems as a natural disaster prevention.
4. *Physical Capital* (Basic infrastructures); elements included in this component are: ***Housing and settlement***: housing condition, situation and condition of settlement; ***Clean water and sanitation infrastructures***: drinking water distribution, wastes management, garbage management; ***Energy infrastructures***: electricity distribution, fuel distribution, gas distribution; ***Healthcare infrastructures***: Hospitals and their medical workers, clinics and their medical workers, ***Economic infrastructures***: city market, District market, village market; ***Education infrastructures***: the number of schools per level, students capacity per level, the number of students per level, the number of teachers per level; ***Communication and information infrastructures***: mass media, communication gadgets, telecommunication networks; ***Transportation infrastructures (accessibility)***: transportation infrastructures (land, water, air), means of transportation (public transportation, logistics transportation, private transportation); ***Livelihood support infrastructures***: reservoir, irrigation.
5. *Financial Capital;* elements included in this component are: ***Savings***: cash on hand, money in banks, gold or jewelry assets, other assets (livestock, plants); ***Credit provider financial institutions*** or savings and borrowings: banks, cooperatives, microfinance, other institutions; ***Routine income***: pension, government's assistance.

2.2. Review and Update on HCV Management and Monitoring Area

This assessment refers to *Common Guidance for the Management and Monitoring of High Conservation Values* (Brown et al., 2013). Additionally, this assessment also uses several toolkits to identify HCV areas in order to update HCV areas against their latest condition and status. The toolkits are:

(i) *The High Conservation Values Forest Toolkit* (Evans et al, 2003)

(ii) Panduan Identifikasi Kawasan Bernilai Konservasi Tinggi di Indonesia (Konsorsium Revisi HCV Toolkit Indonesia, 2008)[5]

(iii) *Common Guidance of the Identification of High Conservation Values* (Brown et al, 2013)[6]

This assessment also identifies changes in HCV area types that are caused by the difference in toolkits used. HCV assessment conducted in year 2010 used "Panduan Identifikasi Kawasan Bernilai Konservasi Tinggi di Indonesia" as the main toolkit.

This assessment consisted of desk study, field survey, data analysis, and report drafting. Desk study consisted of evaluation on previous reports and spatial analysis based on previous assessments. Field survey was focused on areas previously identified as HCV area. During field survey, the presence of HCV areas and the implementation of HCV area management and monitoring were also verified. Additionally, other areas that were potentially be HCV area were also identified to update existing HCV areas.

Field survey on previously identified HCV areas was to assess whether their sizes had stayed the same or changed, verify the presence of HCV elements, evaluate the quality of land cover, and find the factors that had caused changes in previously identified HCV areas.

Field survey on potentially new HCV areas was by ground-truthing areas with natural vegetation and then verifying the presence of HCV attributes and elements in those areas. Participatory mapping and FGD or interviews with the locals were also conducted to identify potentially new HCV areas.

The team conducted this assessment comprised of 4 professionals from Aksenta. They are Iwan Setiawan, Yanto Andriyanto, Andri Novi Hendrarto, and Reza Abdilah. **Table 2** provides more detailed information on those personnel.

Table 2. Team conducting evaluation on HCV areas management and monitoring

Name	ALS License	Role	Expertise

[5] Interpretation and adaptation from HCVF Toolkit (Evans et al., 2003) for context in Indonesia and as toolkit to identify HCV areas.

[6] It is not issued to fully replace existing toolkit, but to widen the usage scope of HCV (Brown et al, 2013; p.ii).

Name	ALS License	Role	Expertise
Iwan Setiawan iwan@akasenta.com	Provisional ALS15039IS	Team leader, biodiversity assessment (HCV1-3)	Wildlife research and survey, wildlife management, *ornithologist*, *community biodiversity assessment* facilitator, participatory mapping, conducted HCV assessment since year 2012
Yanto Andriyanto aulia@aksenta.com	N/A	Team member, environmental service assessment (HCV4)	*Hydrologist*, soil conservation, spatial analysis and remote sensing, water management system, and conducted HCV assessment since 2012
Andri Novi Hendrarto andri@aksenta.com	N/A	Team member, socio-culture assessment (HCV5 and HCV6)	Social and culture study and has conducted HCV assessment since year 2009
Reza Abdillah reza@aksenta.com	N/A	Team member, GIS specialist	Spatial analysis, remote sensing, and land cover change analysis

2.3. Soil and Topography

The soils in PT KMA were assessed according to its topography and properties. As for topography, a digital elevation model (DEM) based on SRTM data was used to define the general topography and slopes throughout the study area. A general field observation was also done to confirm the slopes during period of soil survey in 2016.

The soil properties assessed include parent material, soil colour, texture, structure, drainage, depth, and Pedological feature (i.e. stone-concretion). Those properties were assessed during soil survey in PT KMA in 2016, semi detailed survey for KMA Selatan and reconnaissance survey for KMA Tengah. The findings are then combined with information derived from land unit map of Regional Physical Planning Program for Transmigration (RePPProt) Vol. 1 for Kalimantan Tengah, to draw the suitability Map.

2.4. Carbon Stock Assessment and GHG Emissions

Carbon Stock Assessment

There are general five steps conducted for this assessment. They are desk study, survey and sampling, laboratory analysis, data analysis and mapping, and report writing. **Table 3** and **Figure 4** provide details on activities conducted for CSA and detailed process on conducting this assessment, respectively.

Table 3. Date and location of assessment activities

Date	Activity	Location
June 14-15, 2016	Desk study and field visit preparation	Aksenta office
June 16, 2016	Travel to the study area	Sampit – PT. KMA
June 17-21,	Field survey	Development area plan of PT.

Date	Activity	Location
2016		KMA
June 22, 2016	Closing meeting Travel to Sampit	Development area plan of PT. KMA
June 23, 2016	Submitting destructive sample and soil sample to laboratory	Lab ICBB, Bogor
June 30, 2016	Pre-result mapping	Aksenta office
July 1-31, 2016	Data analysis	Aksenta office
August 1-11, 2016	Writing assessment report	Aksenta office
August 12, 2016	Report submission	

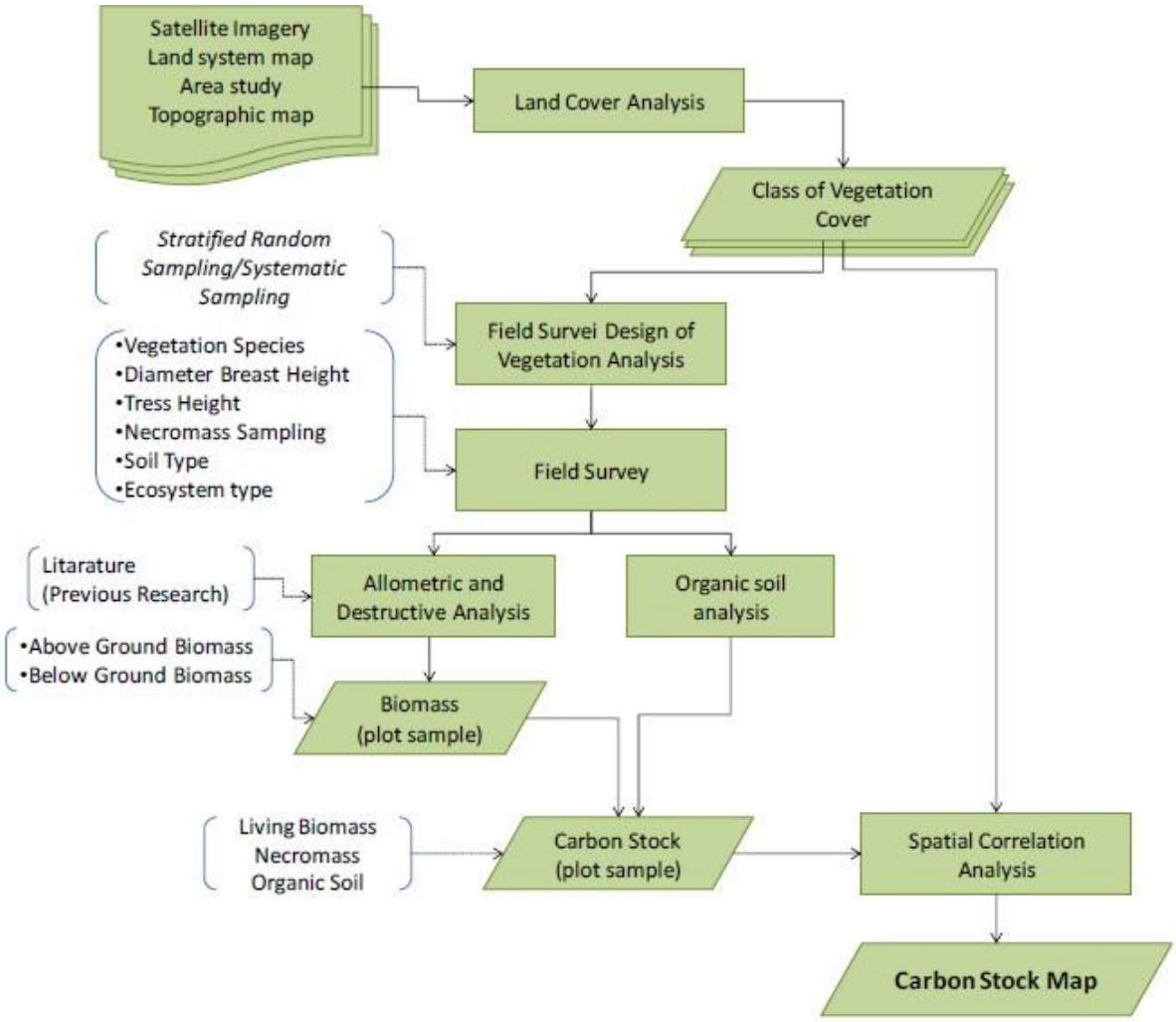


Figure 4. Detailed assessment process

The team conducted the assessment comprises 3 personnel of Aksenta and is led by Risa Desiana Syarif, whom is an expert in remote sensing, spatial analysis, land usage change analysis, and carbon stock measurement. The other two team members are Pramitama Bayu

Saputro, whom is an expert in biodiversity assessment, forest ecology, land usage change analysis, and remote sensing and has done many biodiversity survey in Indonesia and Malaysia, and Heidei PH, whom is an expert in land cover change analysis, identifying land physical characteristics by remote sensing.

IPCC (2006) has categorized carbon pools into 3 categories, which are live biomass, dead organic matter, and soil carbon. Live biomass is further categorized into Above Ground Biomass (AGB) and Below Ground Biomass (BGB). Dead organic matters are separated into dead trees and litter. **Table 4** provides further details for the aforementioned categories.

Table 4. Date and location of assessment activities

	Carbon pools	**Description**
Biomass	Above ground biomass	All living vegetation above ground
	Below ground biomass	All biomass whose roots are still alive. Roots with diameter less than 2 millimeters are excluded from calculation due to its difficulty in being separated from dead organic matters.
Dead organic matters	Woody debris	All dead trees, which include those still erected above ground and buried under ground, with diameter greater than 10 centimeters.
	Litter	All dead biomass in lay down position with diameter greater than 2 millimeters to 10 centimeters and various decomposition stages.
Soil	Soil organic matter	All organic matters contain in soil with depth between up to 60 centimeters for mineral soil and all depths for peat soil. Roots and litter with diameter less than 2 millimeters are included in this category.

Land cover analysis is part of preliminary step to know the stratification of land cover vegetation in the assessed area. Land cover vegetation stratification refers to SNI 7645/2010 regarding land cover classification. Determining the size of sample to be taken from the assessed area also uses the stratification resulted from the analysis.

Method used in land cover analysis is unsupervised classification, which classifies objects on the surface based on spectral combination value most responsive to vegetation or band 654. After acquiring land cover classification, the number of vegetation plots for sampling and its location are calculated and determined for field verification.

Aside from using band 654, the assessment also uses satellite image using band 543 (Color Infrared Vegetation) that enables assessors to acquire canopy density and photosynthesis intensity on every land covers vegetation. Map of biomass and carbon stock can be produced by analyzing satellite image using band 543.

SNI 7724:2011 and Manuri et.al (2011) provide a method to estimate carbon stock of an area by adding the multiplication result between ratio of sample plot size and size of assessed area with biomass value or carbon value on relevant sample plot according to vegetation stratification. The summation value can only show biomass or carbon value in total for a particular area. However, such result will provide low accuracy when used to map biomass and carbon stock.

Vegetation density classification using remote sensing data is necessary to extrapolate from plotting scale to whole area. Extrapolation from plotting scale to whole area uses vegetation density variable derived from Landsat 8 satellite image and wavelength of short wave infra-red (SWIR-1/band 6).
To acquire high accuracy, sampling for carbon stock assessment uses stratified random sampling. Such method allows various vegetation type and density to not negatively affect the extrapolation of biomass or carbon stock value.

GHG Emissions

The assessment consists of (1) desktop study, (ii) field survey, and (iii) analysis and report drafting. The sequence of activities was conducted from June 2016 to July 2016. A team consisting of 5 personnel from Aksenta conducted the assessment. **Table 5** provides the names of the personnel and their expertise.

Table 5. Team conducting GHG emission assessment

Assessment	Name	Expertise
GHG *Assessment for New Planting*	Bias Berlio Pradyatma	New Development Greenhouse Gas Calculator
Carbon Stock Assessment	Pramitama Bayu Saputro	*Wildlife Biodiversity, Land Use Change Analysis, Carbon Stock Estimation,* HCS *Approach Practice, Remote Sensing,* GIS *Analysis*
	Heidei Putra Hutama	*Carbon Stock Estimation, Land Use Change Analysis, Soil Physical Properties, Remote Sensing,* GIS *Analysis, Agro Climatology*
	Risa Desiana Syarif	*Remote Sensing, Land Use Change Analysis,* GIS *Analysis*, *Carbon Stock Estimation,* HCS *Approach Practice*
	Bias Berlio Pradyatma	*Carbon Stock Estimation,* HCS *Approach Practice*, *Land use Change Analysis, Greenhouse Gas Emission Calculation,* GIS *Analysis*

Carbon is the element in CO_2, biomass, and soil organic matter. CO_2 is the greenhouse gas compound emitted from human activities. Thus, carbon mass equivalent CO_2 (ton CO_2e) is used as a unit measurement in this assessment.

Estimating greenhouse gas emission uses August 2016 version of RSPO New Development Green House Gas Calculator (CO_2). This calculation tool estimates net yearly greenhouse gas emission by new plantation. Variables used in the calculator are:

a. Land use change emission
b. Fresh fruit bunch production
c. Field fuel
d. Peat emission
e. Fertilizer and N_2O
f. Conservation area sequestration
g. Crop sequestration
h. Mill data

2.5. LUC Analysis

Period used for the analysis is divided into 5 segments, which are (i) prior to November 2005 (RSPO Principle & Criteria first implemented), (ii) November 2007 (last month for trial stage of RSPO Principle & Criteria), (iii) March 2009 (one of KLK Group subsidiaries received RSPO certification), (iv) January 2010 (effective date of RSPO New Planting Procedure), and (iv) July 2010 (HCV assessment date of PT. KMA). Furthermore, additional LUC Analysis were then undertaken in accordance with the update Legal Operational Area of PT KMA and the HCV Review and Update as a requirement of NPP. The additional LUC Analysis includes the date of HCV Review and Update as an additional cut-off date, resulting reanalysis of six period with the following cut-off dates, (i) prior to November 2005 (RSPO Principle & Criteria first implemented), (ii) November 2007 (last month for trial stage of RSPO Principle & Criteria), (iii) January 2010 (effective date of RSPO New Planting Procedure), (iv) July 2010 (HCV assessment date of PT. KMA), (v) June 2014 (initial LUC Analysis), and (vi) September 2016 (HCV Review and Update).

A set of satellite imagery were used as the basis to derive the historical land use change in the study area. Analysis should be done with satellite imagery that represents land cover condition in the cut-off dates. However, due to the limited availability of the imagery (acquisition date and quality of the imagery), best imagery with closest acquisition date to the cut-off dates of the analysis were used. The satellite imagery used in the study consists of Landsat Imagery with acquisition date of (i) December 28, 2005; (ii) January 19, 2008; (iii) January 16, 2010; (iv) February 19, 2010; (v) June 12, 2014; and (vi) July 27, 2016.

The initial LUC Analysis was conducted within 30 days from August 2014 to September 2014. There are 3 activities done for the assessment: (i) desktop analysis and remote sensing (August 10-16, 2014) in Bogor and Jakarta, (ii) ground verification (August 18-31, 2014) in PT. KMA permit area, and (iii) analysis and report writing (September 1-25, 2014) in Bogor and Jakarta. The additional LUC Analysis was conducted in September 2017, it includes review process of the data and the previous LUC Analysis, re-analysis with new scope, and reporting. The process of LUCA is given in Figure 5.

Land use change analysis was conducted in PT. KMA permit area located in Mentaya Hulu districts of Kotawaringin district of Kalimantan Tengah province.

The additional LUC Analysis in accordance with the update of legal operational area of PT KMA was conducted in November 2017. This study used the business license area (HGU) of PT KMA as the scope of analysis. In accordance with the HCV Review and Update, date of the HCV Review and Update were used as an additional cut-off date of the reanalysis. Therefore, the analysis includes the four cut-off dates as used in the initial LUC Analysis, namely (i) prior to November 2005 (RSPO Principle & Criteria first implemented), (ii) November 2007 (last month for trial stage of RSPO Principle & Criteria), (iii) March 2009 (one of KLK Group subsidiaries received RSPO certification), (iv) January 2010 (effective date of RSPO New Planting Procedure), and (iv) July 2010 (HCV assessment date of PT. KMA) and (v) September 2016 (HCV Review and Update).

The team conducted the analysis comprises 4 people. Sujatnika is the team leader whom is an RSPO approved HCV assessor and has expertise in forestry, biodiversity conservation, HCV assessment and management. Risa Desiana Syarif whom is in the process of being RSPO approved HCV assessor is a specialist of HCV 5 and HCV 6 and has expertise in forestry, community forestry, GIS, remote sensing, land use change analysis, and carbon stock estimation. Pramitama Bayu whom is in the process of being RSPO approved HCV assessor is a specialist of HCV 1, HCV 2, and HCV 3 and has expertise in forestry, biodiversity conservation, GIS, remote sensing, and land use change analysis. Aulia Bahadhori Mukti is a surveyor for High Carbon Stock and land suitability and has expertise in GIS, remote sensing, land use change analysis, and carbon stock estimation.

Land cover classification is conducted by supervised classification and continues with visual interpretation onto readily available to be analyzed satellite image. Classification is conducted using ERDAS Imagine 9.1 and ArcGIS v.10.1 software.

Sampling locations for the purpose of field verification were chosen using purposive sampling technique. The total number of sampling points required for field verification is between 62 and 213 points. Figure 6 gives the distribution of sampling points used for field verification (points are represented by yellow dots named “Rencana Survey”). Field verification was focused on verifying land cover that is similar with land cover in November 2005.

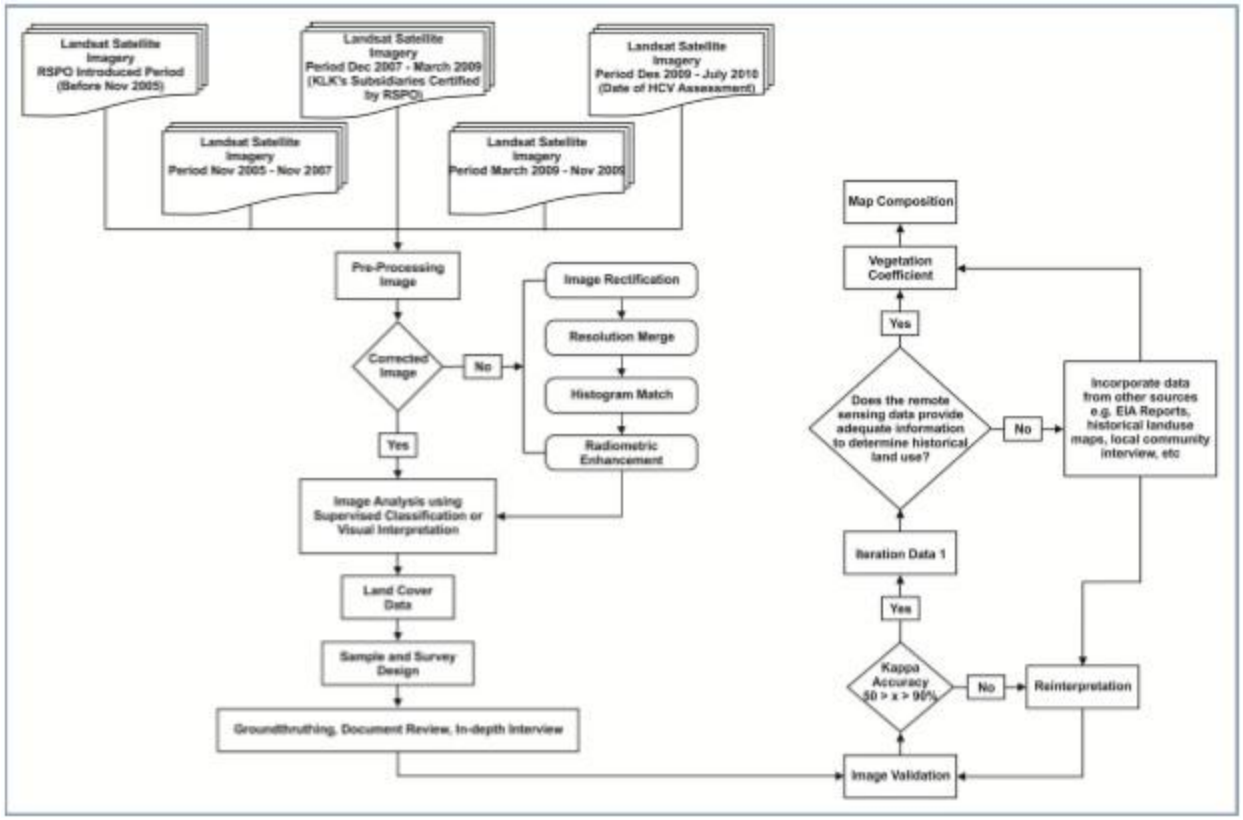


Figure 5. Detailed LUCA process

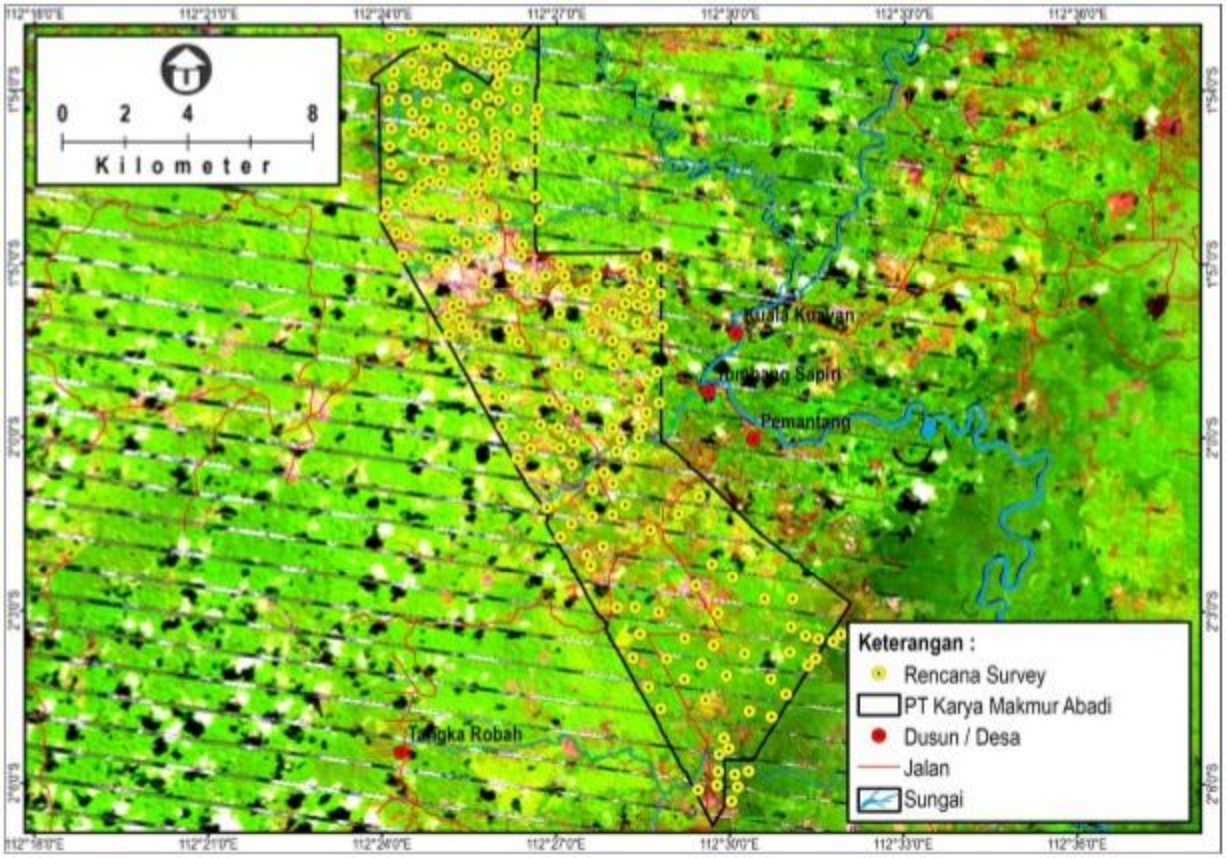


Figure 6. Sampling points in PT. KMA permit area

2.6. FPIC Process

This FPIC verification assessment was conducted by two personnel from Aksenta, Bias Berilio Pradyatama and Afwan Afwandi. Bias Berilio Pradyatama is an expert in forestry, biodiversity conservation, GIS, remote sensing, carbon stock estimation, and HCS Approach Practice. Afwan Afwandi is an expert in community forestry, social impact assessment, social survey, community socio-economic, FPIC, and participatory mapping.

This assessment was conducted from June 2016 to July 2016. This process consisted of (i) preliminary study conducted at Jakarta, (ii) collecting information and data from the field through interview, observation, and document review, and (iii) report drafting conducted at Jakarta.

There are three stages undertaken when conducting HCS assessment. First stage is using high quality satellite data on the concession area and identifying high carbon stock potential areas. Second stage is identifying forest areas that can be maintained or can be returned to their original functions. Third and final stage is acquiring consent and support from indigenous people and the locals for conserving, managing, and protecting previously found forest areas.

Implementing FPIC in HCS refers to Free, Prior and Informed Consent: Guide for RSPO members (2015). In the guidance, risk assessment on the targeted area must first be conducted. In this stage, people whom have interests with the study area must also be identified. The people can be inhabitants of the study area or those who are utilizing the study area for a certain purpose.

If there are inhabitants in the study area or people who are individually or communally using the study area, the company must proactively inform them that they have the right to choose their own representatives and organization to interact with the project initiator. Depending upon the problem at hand, they also have the right to choose more than one representative.

If verification results indicate that there are no inhabitants in the study area or people who are individually or communally utilizing the study area, then FPIC is not necessary to be conducted.

3. Summary of Findings

3.1. Social Impact Assessment

Social issues rising both internally and externally are either related with plantation activities or not related with plantation activities. Social issues not related with plantation activities will be detailed based on the village where the issues exist.

Internal social issues and social risks

Social issues related with plantation activities conducted by PT KMA are specifically related with the company's social communication and relationship, workers recruitment and management, and infrastructure development. **Table 6** provides further details on social issues related with PT KMA's plantation activities.

Table 6. Social issues related with PT KMA's plantation activities

Activity	Issues		
	Past	**Current**	**Potential**
Social communication and relationship	-	Harvesters feel that the regulation determining average weight of fruits is not to their expectation.	If there are no satisfactory explanations, harvesters may be demotivated.
Workers recruitment and management	-	PT KMA protects workers' right to congregate but there is no labor union. Workers are hoping for a labor union to be formed.	-
	-	Workers hoped that there will be special training for workers,	-

Activity	Issues		
	Past	Current	Potential
		especially foremen for plantation tending.	
Infrastructure development	-	Some housings provided by PT KMA do not have supply of water for consumption, thus causing workers to purchase water.	-
	-	Some housings provided by PT KMA are still made of wood. Additionally, the number of housings available is not enough for all the workers. Thus, some housings are being inhabited by more than one family.	The company will develop new housings complete with clean water facility after majority of its area has been acquired and cleared.

Social risk amongst the company's workers arises from the company's workers recruitment and management activity. Some workers are not equipped with safety equipment, some spraying workers are forced to use swamp water and have no water for rinsing, and some workers are forced to buy their own safety equipment.

Social impact of PT KMA's presence towards the locals

Plantation development stages are the basis of discussion regarding potential impact and social impact. Based on current condition, not all stages will have important impact or potential social impact. Impact or potential social impact judged to be less important will not be discussed in impact discussion.

An impact or potential impact is judged to not important if 1. Its impact is weak and not beneficial to be discussed; 2. An impact or potential impact of a particular stage is too difficult to predict due to non-definitive planning and/or not yet become social issue, thus discussion regarding potential impact will have large bias.

Activities that will be executed by PT. KMA are all plantation development stages such as communication development, social relation, acquiring permit, recruitment and management of labors, securing plantation, transport management, equipment maintenance, acquiring land, land clearing, infrastructure development, factory development, seeding, planting, plant caring, harvesting, and replanting.

Bulking and shipping are excluded from discussion due to limited time to properly identify all impacts from activities involved. **Table 7** provides impacts from the company's aforementioned activities.

Table 7. Social impacts from PT KMA's activities

Sustainability of social livelihood		**Impact**	**Source of impact**
Human capital	Skill	(+) – communities can learn palm agricultural technique	Labors recruitment
	Education	(+) – assistance for teachers' incentive and infrastructure reparation	Labors recruitment and CSP program
	Health	(+) – employees are part of BPJS program	Labors recruitment
Social capital	Social interaction	(-) – decrease in social solidarity in communities	Plantation development and operation
	Trust level	(-) – decrease in social trust	Plantation development and operation
	Norms	(-) – communities' inability to properly manage their finance	Acquiring land
	Sanction	(No impact) – according to relevant regulation	Plantation development and operation
Natural capital	Land ownership	(-) – loss of land	Acquiring land
	Land usage	(No impact) – Wide available land for communities	Plantation development and operation
	Access to forest resources	(No impact) – Permit area of PT. KMA has no forest for natural resource exploitation	Plantation development and operation
	Land conflict	(-) – land accessibility and value increase will cause many ownership claims from the communities	Acquiring land
Physical capital	Housing condition	(+) – condition and quality improvements of communities' housing for recipients of land compensation and workers at PT. KMA.	Acquiring land and labors recruitment
	Vehicle ownership	(+) – increase in the number of vehicle ownership by the communities.	Acquiring land, labors recruitment, and entrepreneurship
	General infrastructure	(+) – improvement in road condition and irrigation development.	CSR program
	Production equipment	(No impact) - Wide available land for communities	Plantation development and operation
Financial capital	Income source	(+) – alternative source of income through employment opportunity and/or rental service, thus increasing communities' purchasing power.	labors recruitment and entrepreneurship
	Saving	(+) – increase in savings due to land compensation, employment opportunity, and entrepreneurship.	Acquiring land, labors recruitment, and entrepreneurship
	Credit access	(No impact) – no financial institution in surrounding villages	Plantation development

External Social Issues and Social Risks

Social issues developing in Tumbang Sapiri village and Kuala Kuayan sub-district, where both are located around PT KMA's central part of operational area, are:

- The use of poison to catch fishes by non-local workers has disturbed the fishes' habitat, thus causing the decline in the amount of fishes being caught by the villagers of Tumbang Sapiri.
- Limited availability of housings for teachers has caused teachers to live outside of Tumbang Sapiri village.
- Limited availability of graveyards has caused anxiety amongst the locals, especially those whom are living in Tumbang Sapiri village.
- Uncontrolled circulation of drugs and alcohol has caused misbehaving teens, especially in Kuala Kuayan sub-district.

Social issues developing in Pemantang, Kapuk, Tangka Robah, and Pahirangan villages, where both are located around PT KMA's southern part of operational area, are:

- Difference in CSR received amongst villages has caused social jealousy.
- Repeated claims on lands that have been compensated by PT KMA.

Aside from the aforementioned issues, general issues found in all villages are:

- Declining rattan and rubber prices in the last two years.
- Regulation, issued by Kalimantan Tengah provincial government, forbidding forest and land burning has stopped the locals from doing agricultural activities. The regulation can also affect the locals' cohesiveness.
- Limited opportunity to work at PT Karya Makmur Abadi.

3.2. Review and Update on HCV Management and Monitoring Area

HCV assessment by Jump Consulting in year 2010 identified areas containing HCV 1, HCV 3, and HCV 4. The identified HCV areas contained more than one HCV type as depicted by **Figure 7**. The total size of identified HCV area in year 2010 was 138.86 ha. The identified HCV areas were found in Kawan Batu, Hai, and Sapiri rivers.

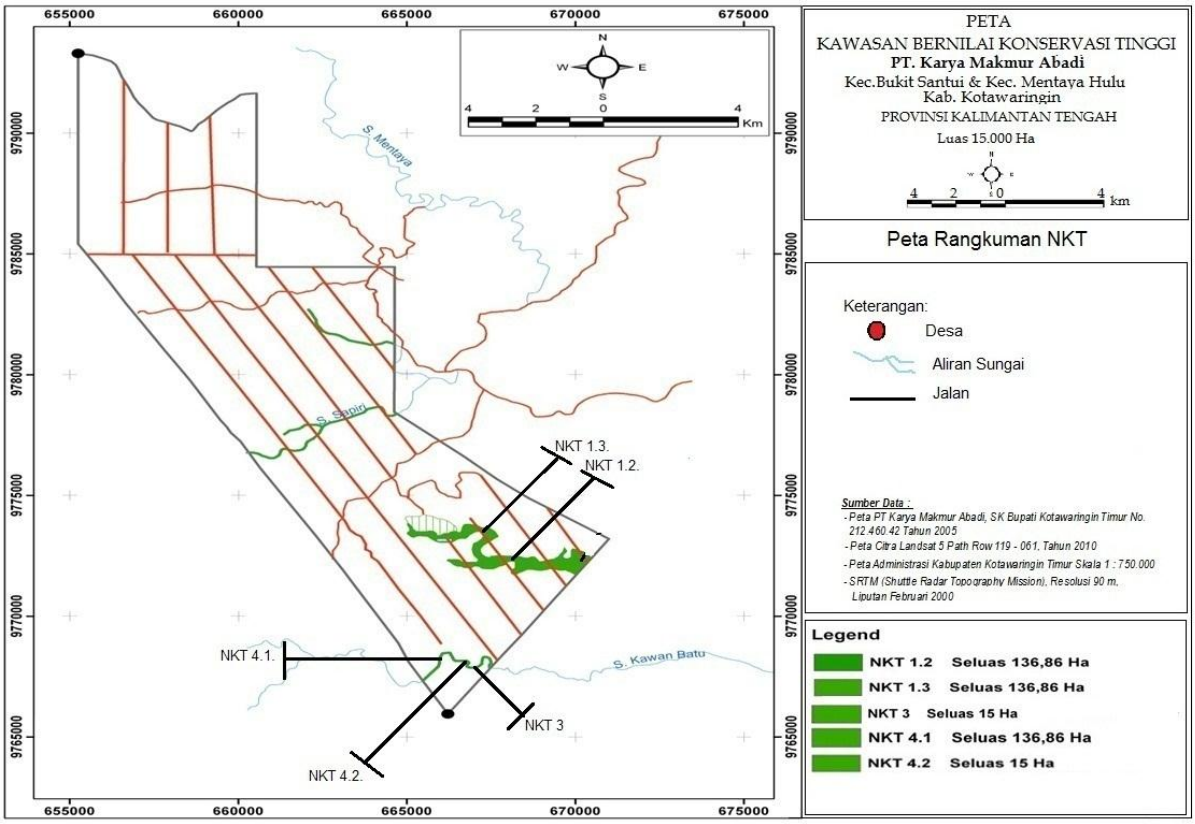
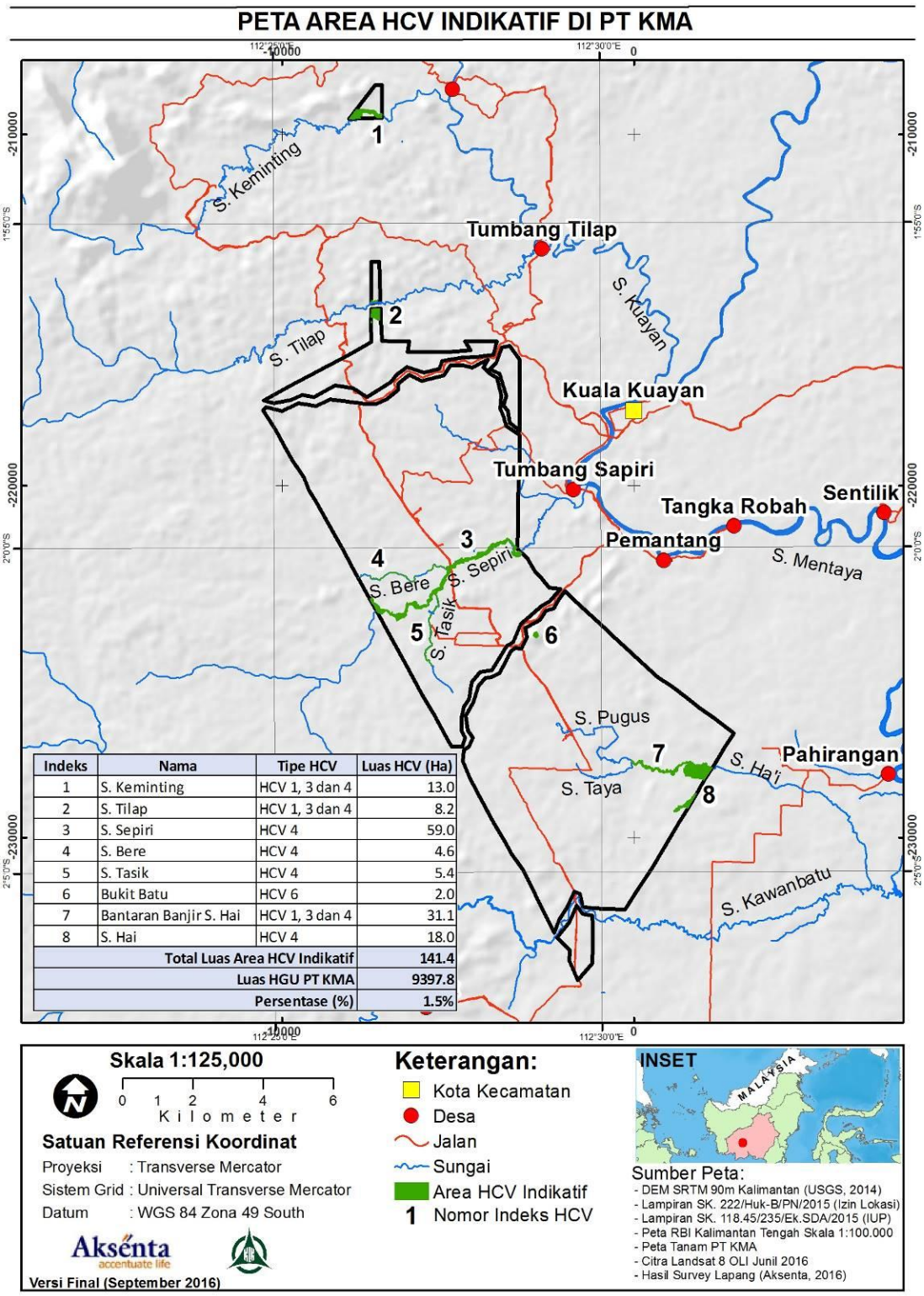


Figure 7. Map of HCV indicative area in year 2010

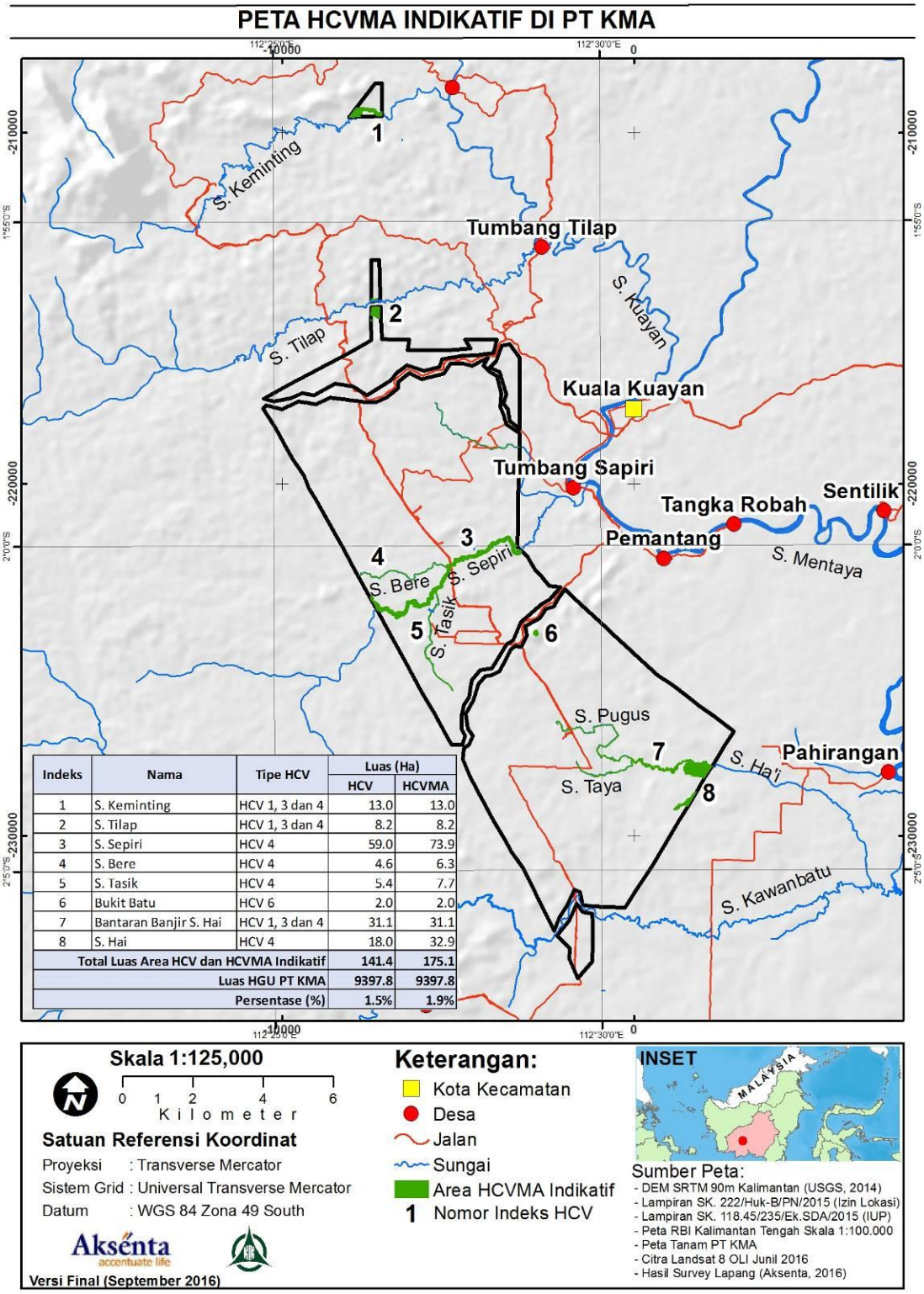
Evaluation of HCV area management and monitoring conducted by Aksenta in year 2016 had identified areas with HCV 1, HCV 3, HCV 4, and HCV 6. The identified areas were located in Kawan Batu, Hai, Sapiri, Bere, and Tasik rivers (**Figure 8**). The total HCV areas identified in year 2016 was 141.4 ha or 1.5% of total study area. The total HCV areas identified by Aksenta included the HCV areas identified by Jump Consulting in year 2010.



Indeks	Nama	Tipe HCV	Luas HCV (Ha)
1	S. Keminting	HCV 1, 3 dan 4	13.0
2	S. Tilap	HCV 1, 3 dan 4	8.2
3	S. Sepiri	HCV 4	59.0
4	S. Bere	HCV 4	4.6
5	S. Tasik	HCV 4	5.4
6	Bukit Batu	HCV 6	2.0
7	Bantaran Banjir S. Hai	HCV 1, 3 dan 4	31.1
8	S. Hai	HCV 4	18.0
	Total Luas Area HCV Indikatif		**141.4**
	Luas HGU PT KMA		**9397.8**
	Persentase (%)		**1.5%**

Figure 8. Map of indicative HCV area in year 2016

The total size of HCV management area identified by Aksenta in 2016 was 175.1 ha. The size of HCV management area higher than the size of HCV area was because of 14.9 ha area in Sepiri River, 1.7 ha area in Bere River, 2.3 ha area in Tasik River, and 14.9 ha area in Hai River (**Figure 9**).



Indeks	Nama	Tipe HCV	Luas (Ha)	
			HCV	HCVMA
1	S. Keminting	HCV 1, 3 dan 4	13.0	13.0
2	S. Tilap	HCV 1, 3 dan 4	8.2	8.2
3	S. Sepiri	HCV 4	59.0	73.9
4	S. Bere	HCV 4	4.6	6.3
5	S. Tasik	HCV 4	5.4	7.7
6	Bukit Batu	HCV 6	2.0	2.0
7	Bantaran Banjir S. Hai	HCV 1, 3 dan 4	31.1	31.1
8	S. Hai	HCV 4	18.0	32.9
Total Luas Area HCV dan HCVMA Indikatif			141.4	175.1
Luas HGU PT KMA			9397.8	9397.8
Persentase (%)			1.5%	1.9%

Figure 9. Map of indicative HCVMA area in year 2016

There were insignificant changes occurred to the HCV area in PT KMA. There were some HCV areas whose land cover quality had decreased, while there were some HCV areas whose land cover quality had increased. There were three factors affecting the condition of HCV areas in the study area, namely (1) the company's policy regarding HCV management, (2) organization structure and human resources, and (3) the implementation of HCV management and monitoring plan from year 2010.

The company did not have Standard Operating Procedure regarding HCV area management and monitoring. The company had conducted socialization regarding HCV area, but not all employees were aware of the socialization.

Having personnel with limited knowledge and skill made the team responsible in managing and monitoring HCV areas to underperform. Sustainability team was overload with other tasks, such as certification, health and safety, and HCV conservation.

Jump Consulting had recommended in year 2010 HCV management and monitoring plan for the next three years or until 2013. The only activity related to HCV management and monitoring conducted by the company was water quality monitoring.

3.3. Soil and Topography

Majority of soils in Central Estate was also identified as shallow to moderately deep lateritic soil. The soils have clayey texture with various slopes. The areas of rolling to hilly terrain were occupied about 40% of total area, and the dominant soil series was Kemuning. It has properties such as clayey in texture, brownish yellow color, argillic profile, and well drained. Based on reconnaissance soil survey in Central Estate, there was no indication of peat and sandy soil, as well as steeper areas (> 25 °). Around 99% of land in Central Estate is classified as marginally suitable and only 1% is suitable (see **Table 8 and Figure 10**).

Table 8. Land Suitability of Central Estate

Symbol	Land Suitability Class		Extent	
	Current	Potential	ha	%
S3-s	S3-s (marginal - lateritic soil and moderately deep soil)	S3-s (marginal - lateritic soil and moderately deep soil)	2,464	48%
S3-ts	S3-ts (marginal-hilly terrain and moderately deep soil)	S3-ts (marginal-hilly terrain and moderately deep soil)	1,846	36%
S3-ts	S3-ts (marginal - hilly terrain and moderately sha	S3-ts (marginal- hilly terrain and moderately shal	444	9%
S3-s	S3-s (marginal- moderately deep and lateritic soil)	S3-s (marginal- moderately deep and lateritic soil)	212	4%
S2-s	S2-s (moderately suitable-moderately deep soil)	S2-s (moderately suitable-moderately deep soil)	52	1%
S3-df	S3-df (marginal-poor drainage), flood risk, fertil	S2-d (moderately suitable-poor drainage)	51	1%
S3-t	S3-t (marginal-hilly terrain)	S3-t (marginal-hilly terrain)	13	<1%
S3-ds	S3-ds (marginal-poorly drainage and moderately sha	S3-s (marginal-moderately shallow)	7	<1%
Total			**5,089**	**100%**

Within the unplanted areas in Central Estate, there is no existence of fragile-marginal soils. The suitability class for the unplanted areas is moderately suitable (24 Ha-2%) and marginally suitable (1,651 Ha-98%) soils.

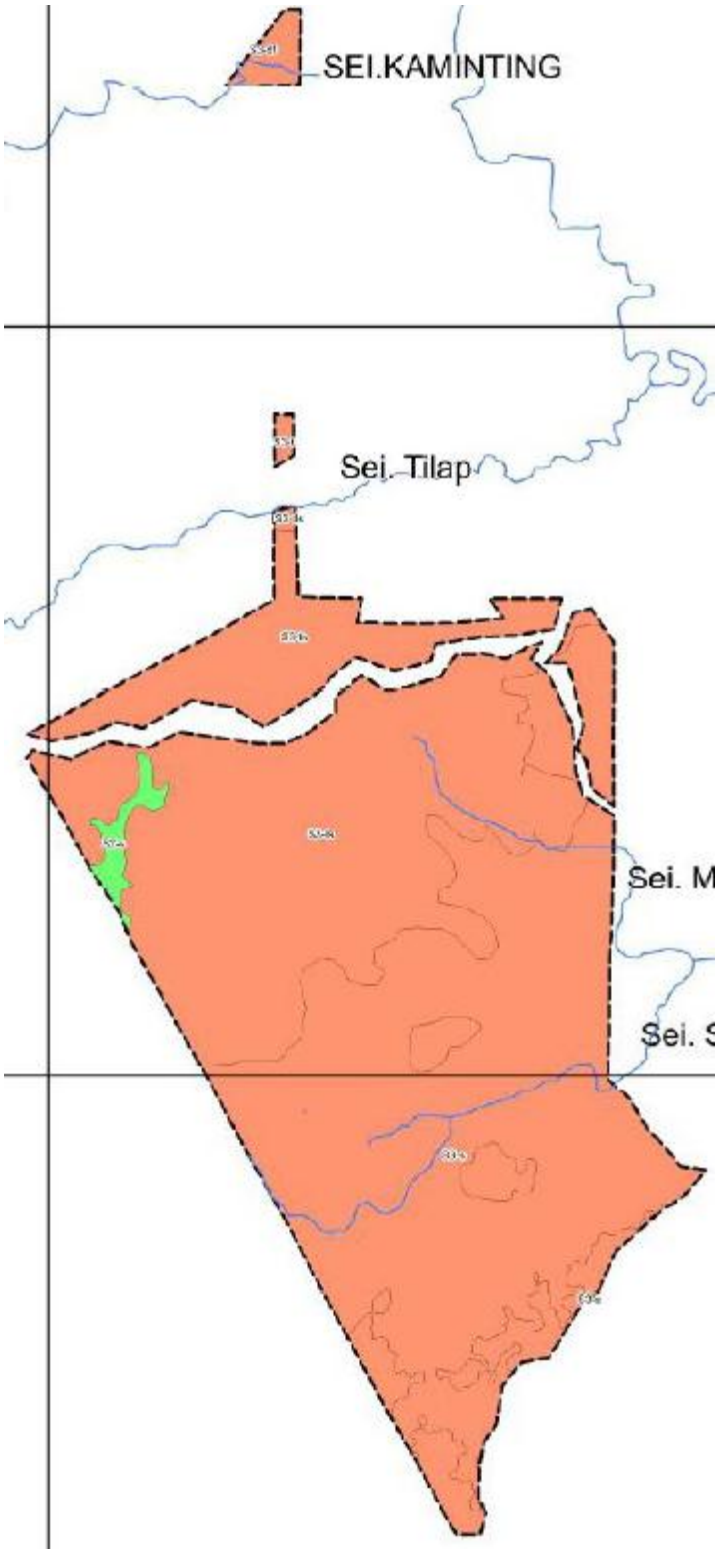


Figure 10. Distribution of Land Suitability of Central Estate

Majority soils in South Estate were moderately deep to shallow soil (61% of total area), due to containing lateritic-gravelly quartz. There were sandy soils found in South Estate, i.e. Berhala and Plan. These two soils were originated from recent alluvium material. Based on its distribution, the later was occupied only 9% of total area and further classified as marginal-fragile soils (see **Table 9 and Figure 11**).

If we focused only for unplanted areas in South Estate (487 Ha), then about 45% of the area is considered as suitable to moderately suitable and the remaining 55% is marginally suitable soil. As for fragile-marginal soils, we found that the total was only about 35 Ha, consist of Berhala 24 Ha (5%), Plan 9 Ha(2%), and Peat-hemists 2 Ha (<1%).

Table 9. Land Suitability of South Estate

Symbol	Suitability Class		Extent	
	Actual	Potential	ha	%
S1	S1 (highly suitable)	S1 (highly suitable)	849	20%
S2	S2s (moderately suitable due to moderately deep soil)	S2s (moderately suitable due to moderately deep soil)	1,063	25%
S3p	S3p (marginal - sandy loam texture)	S2p (moderately suitable - sandy loam texture)	135	3%
S3pd	S3pd (marginal - peat texture and poor drainage)	S3pd (marginal - peat texture and poor drainage)	10	0%
S3s	S3s (marginal- shallow soil and lateritic soil)	S3s (marginal- shallow soil and lateritic soil)	340	8%
S3sp	S3sp (marginal - lateritic soil and shallow soil)	S3sp (marginal - lateritic soil and shallow soil)	1,520	35%
S3spd	S3spd (marginal - sandy soil, shallow soil, poorly drained	S3spd (marginal - sandy soil, shallow soil)	50	1%
S3tp	S3tp (marginal - hilly terrain and lateritic soil)	S3tp (marginal - hilly terrain and lateritic soil)	50	1%
S3ts	S3ts (marginal - hilly terrain and lateritic soil at surface)	S3ts (marginal - hilly terrain and lateritic soil at surface)	282	7%
Total			**4,298**	**100%**

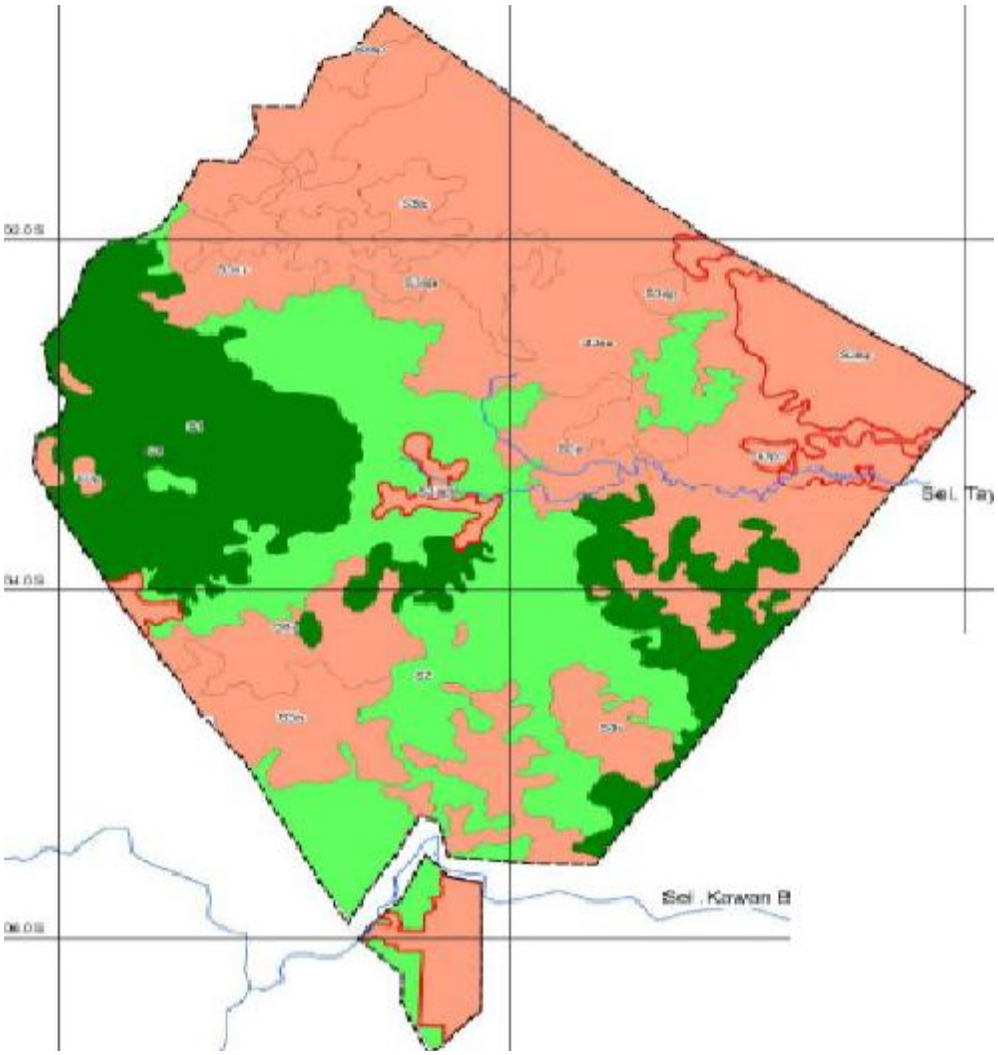


Figure 11. Distribution of Land Suitability of South Estate

3.4. Carbon Stock Assessment

Estimated values of biomass and litters from plots become the foundation to calculate carbon stock for the entire study area. Carbon stock originated from AGB is calculated based on biomass mapping value result (ton/ha) using Carbon Fraction 0.47. In this assessment, biomass data used are resulted from extrapolation on the entire development plan area of PT. KMA. Biomass carbon in this assessment has 3 categories, which are:

1. BC-1: Carbon stock biomass < 35 ton-C/ha
2. BC-2: Carbon stock biomass 35-75 ton-C/ha
3. BC-3: Carbon stock biomass > 75 ton-C/ha

Total carbon stock biomass from AGB and BGB in the assessed area is around 16.7 kilo ton-C. Total carbon stock in development plan area of PT. KMA is 60.3 kilo ton-C. The highest carbon

stock originated from soil, which is 49.3 kilo ton-C. Table 6 provides carbon stock values according to sources and land cover biomass classification.

Total carbon stock in the study area is dominated by carbon originated from soil, which makes around 82% of total carbon stock from all carbon pools (**Table 10 & Figure 12**).

Table 10. Total carbon stock in the study area

Strata	Above Ground Biomass Carbon (kilo Ton-C)*			Total	Area (ha)**	Average (Ton-C/ha)
	BC1	BC2	BC3			
Bl (Thickets)	8.1	11.1	-	19.2	544.4	35.2
SB (Shrubs)	16.0	-	-	16.0	915.3	17.4
SM (Bushes)	0.9	-	-	0.9	281.7	3.1
Average carbon (Ton-C/ha)	**16.8**	**42.5**		**20.7**		

*BC1= < 35 Ton-C/Ha; BC2= 35 - 75 Ton-C/Ha; BC3= > 75 Ton-C/Ha

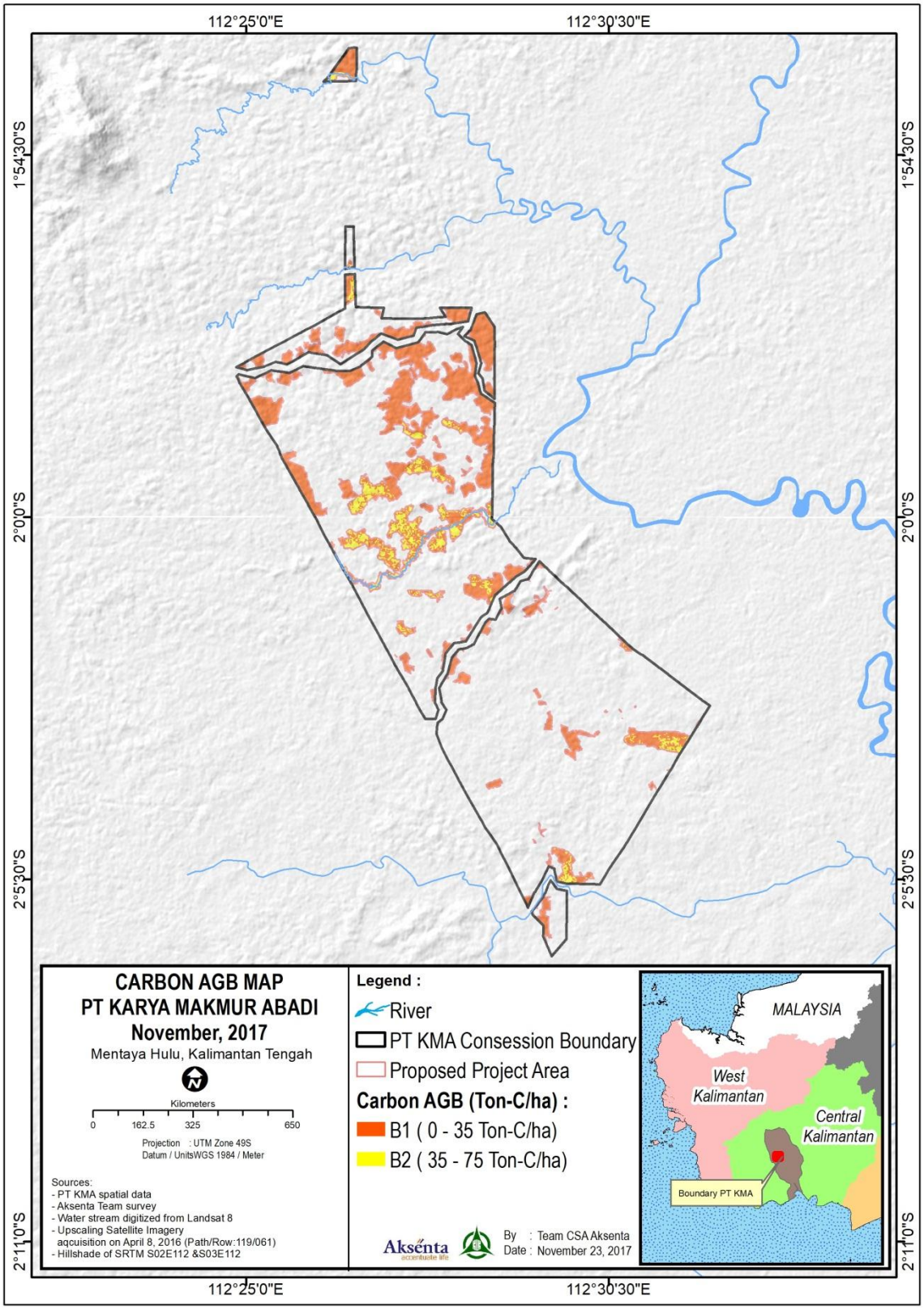


Figure 12. Map of carbon stock biomass in the study area

3.5. GHG Emissions

Greenhouse Gas Net Emission Baseline

Plantation operation is one of greenhouse gas emission and fixation source. Emissions from plantation operation consist of (i) land clearing, (ii) production and fertilizers, (iii) N_2O emission from fertilizers, (iv) fuel usage in the plantation, and (v) emission from peat decomposition, when there is planting in peat soil. Fixation sources from plantation operation consist of crop sequestration and conservation credit. Based on the analysis on components of emission and fixation from new plantation development in the study area, fertilizers will be the main source of GHG emission. **Table 11** provides further details on the result of GHG emission and fixation analysis on new plantation development. The net GHG emission resulted from new palm plantation development is -325.6 ton CO_2e, which implies GHG fixation. Thus, new palm plantation development will increase the carbon stock in the study area.

Table 11. Estimated GHG emission from new palm plantation development plan

Sources	Total Emissions (t CO_2e)	Emission/Area (t CO_2e/ha)	Emission/Produced FFB (t CO_2e/t FFB)
Land clearing	115.59	0.84	0.03
Crop sequestration	-1,285.33	-9.36	-0.37
Fertilizers*	754.05	5.49	0.22
N_2O	574.56	4.18	0.17
Field fuel*	42.60	0.31	0.01
Peat	0.00	0.00	0.00
Conservation credit	-527.07	-3.84	-0.15
Total	-325.61	-2.37	-0.09

*Amount of the fertilizers and fuel uses are reflected from the existing plantation management

Sources of GHG emission from factory consist of (i) palm oil mill effluent / POME, (ii) mill fuel, and (iii) purchased electricity. Sources of GHG fixation from factory consist of excess electricity exported and sale of biomass for power. Based on the analysis on GHG emission and fixation from factory, POME is the largest source of GHG emission. Palm oil factory will decrease the value of carbon stock in the study area. **Table 12** provides the result of the analysis.

Table 12. Estimated GHG emission from palm oil factory

Sources	Total Emissions (t CO_2e)	Emission/Area (t CO_2e/ha)	Emission/Produced FFB (t CO_2e/t FFB)
POME	672.81	4.90	0.20
Mill fuel	35.23	0.26	0.01
Purchased electricity	0.00	0.00	0.00
Credit (excess electricity exported)	0.00	0.00	0.00
Credit (sale of biomass for power)	0.00	0.00	0.00
Total	708.04	5.16	0.21

Based on the overall analysis, PT KMA's plan to develop new plantation will result in GHG emission. The result shows that there will be 0.43 ton of GHG emitted per ton of CPO and PKO produced (**Table 13**). Furthermore, result of the analysis would be used as baseline to design scenarios in the development plan in accordance with effort to reduce the GHG emissions from the new development.

Table 13. Estimated total GHG emission from new plantation

Field Emissions (t CO_2e)	-325.61
Mill Emissions (t CO_2e)	708.04
Total Emissions (t CO_2e)	382.43
Total Emissions/ha (t CO_2e/ha)	2.79
Total Emissions/Produced CPO (t CO_2e/t CPO)	0.43
Total Emissions/Produced Palm Kernel Oil (t CO_2e/t PK)	0.43

Scenario Testing for New Development Options

Five scenarios were prepared to determine the optimal development plan to reduce the GHG emission in the development plan. Fertilizer is one of the most significant sources of the GHG emission from the field in the development plan according to the baseline greenhouse gas emission projection. Thus, amount of the use of fertilizer is taken into the account in the five scenario tests (**Table 14**).

Table 14. Scenario testing of the new development plan

Scenario		Details				
S1		Setting aside HCV and HCS Areas, no POME treatment, no efficiency on fertilizer use based on the reflection from the existing plantation management				
S2		Setting aside HCV and HCS Areas, no POME treatment, 5% efficiency on fertilizer use based on the reflection from the existing plantation management				
S3		Setting aside HCV and HCS Areas, no POME treatment, 10% efficiency on fertilizer use based on the reflection from the existing plantation management				
S4		Setting aside HCV and HCS Areas, no POME treatment, 15% efficiency on fertilizer use based on the reflection from the existing plantation management				
S5		Setting aside HCV and HCS Areas, no POME treatment, 20% efficiency on fertilizer use based on the reflection from the existing plantation management				
		S1	S2	S3	S4	S5
Conservation Area (ha)	HCV Area	175.1	175.1	175.1	175.1	175.1
	HCS Area	35.4	35.4	35.4	35.4	35.4
Land cover of the proposed area for development (ha)	Secondary Forest	0	0	0	0	0
	Thickets	12.3	12.3	12.3	12.3	12.3
	Shrubs	68.4	68.4	68.4	68.4	68.4
	Open Land	20.8	20.8	20.8	20.8	20.8
	Bushes	43.3	43.3	43.3	43.3	43.3
POME Management	Conventional Treatment	no	no	no	no	no
	Methane Capture	no	no	no	no	no
Fertilizer Use Management	Fertilizer Efficiency	0%	5%	10%	15%	20%

Projection of greenhouse gas emission from each scenario is calculated. Whilst crop sequestration would compensates and results carbon fixation from the field , overall calculation of the emissions from field and mill shows that 382.43 t CO2 e net of greenhouse gas will be emitted. According to the projection of the development plan scenarios, the greenhouse gas emissions will be reduced along the implementation of the scenario 2, 3, 4, and 5. However, implementation of the scenario 3 will result significant reduction of the net GHG emission, although carbon neutral would be reached with the scenario 4 and overall carbon fixation (negative emission) would be reached with the scenario 5 (**Table 15**).

Table 15. Projected greenhouse gas emission the scenarios

Emission ton (CO_2e)					
Source	**S1**	**S2**	**S3**	**S4**	**S5**
Field emissions & sinks					
Land clearing	115.6	115.6	115.6	115.6	115.6
Crop sequestration	-1285.3	-1285.3	-1285.3	-1285.3	-1285.3
Fertilisers	754.0	716.3	644.7	548.0	438.4
N2O	574.6	547.0	494.6	423.9	343.7
Field fuel	42.6	42.6	42.6	42.6	42.6
Peat	0.0	0.0	0.0	0.0	0.0
Conservation credit	-527.1	-527.1	-527.1	-527.1	-527.1
Nett Field Emission	**-325.6**	**-390.9**	**-514.9**	**-682.4**	**-872.1**
Mill emissions & credit					
POME	672.8	672.8	672.8	672.8	672.8
Mill fuel	35.2	35.2	35.2	35.2	35.2
Purchased electricity	0.0	0.0	0.0	0.0	0.0
Credit (excess electricity exported)	0.0	0.0	0.0	0.0	0.0
Credit (sale of biomass for power)	0.0	0.0	0.0	0.0	0.0
Nett Mill Emission	708.0	708.0	708.0	708.0	708.0
Total Nett Emission (Field and Mill)	**382.4**	**317.2**	**193.1**	**25.7**	**-164.1**
Nett Emission/Production					
t CO2e/t CPO	**0.4**	**0.4**	**0.2**	**0.0**	**-0.2**
t CO2e/t PK	**0.4**	**0.4**	**0.2**	**0.0**	**-0.2**

3.6. LUC Analysis

In November 2005 – November 2007 period, The Company did not do anything that merit destruction onto potential areas that may function as HCV 4, HCV 5, and HCV 6 in its permit area. PT. KMA conducted land clearing onto areas that had been acquired through compensating destroyed crops.

Based on satellite image interpretation and spatial analysis, it is known that the size of potential area to be compensated by the company is 3,897.6 ha, which consists of 750.3 ha for the period of November 2005 to November 2007, 2,959.7 ha for the period of December 2007 to December 2009, and 187.6 ha for the period of January 2010 to July 2010.

For the period of November 2005 to November 2007, out of the 750.3 ha compensation area, only 52.3 ha area had 0.7 vegetation coefficient. For the period of December 2007 to December 2009, out of 2,957.7 ha compensation area, only 145.8 ha area had 0.4 vegetation coefficient. For the period of January 2010 to July 2010, all compensation area had 0 vegetation coefficient.

Based on the previously discussed compensation scheme, PT. KMA has no compensation liability for the period of November 2005 to November 2007. There are no areas with HCV 4, HCV 5, and HCV 6 that were lost due to land clearing. The company conducted land clearing on areas containing secondary forest and old thickets in the period December 2007 to December 2009. The size of opened area in December 2007 to December 2009 period was 145.8 ha; hence, the company has compensation liability in the amount of 58.36 ha. There was no additional compensation liability area for the period of January 2010 to July 2010.

Therefore, the total compensation liability area for PT. KMA in its permit area is 58.4 ha. From November 2005 to February 2010, there were no land clearing activities in riverbank areas and areas with slopes greater than 40%. All PT. KMA permit areas have slopes less than 25%. Therefore, there are no areas that must be remediated by PT. KMA.

The additional LUC Analysis identifies 0 ha of liability. The decrease of area due to the update of the PT KMA operational area from location permit to business license area excludes areas with liability from PT KMA operational area, therefore the identified conservation liability in LUC Analysis is not found in the scope of the additional LUC Analysis. However, the 58.4 ha conservation liability is still a responsibility of PT KMA although it is no longer included as the legal operational area of PT KMA.

3.7. FPIC Process

Originally, the locals were dependent on both wood and non-wood forest products. They collected rubber, wood, and resins. They also did shifting cultivation with slash and burn method. However, around 1950s, gold panning activities were becoming very common. Gold mining continued and reached its peak in mid period of 1980-1990. British Petroleum, PT Riotinto, and PT BHP also took part in exploitation and exploration of gold in Mentaya Hulu regions.

PT Kayu Mas and PT Sarpatim both started large scale wood forest products utilization in 1972. PT Mentaya Kalang and Inhutani III are among several companies that started a second wave of large scale wood forest products utilization in 1991 to 2003.

Sinarmas was the first oil palm company to start its operation in the area. It started its operation in 1998. In 2005, PT Karya Makmur Abadi was the second company to start oil palm plantation operation.

Since 2010, the locals have abandoned shifting cultivation with slash and burn method in favor of permanent cultivation. Fewer lands available for cultivation and the prohibition on burning forest and land are the main reason for the locals abandoning shifting cultivation. Decreasing rubber and rattan prices has pushed the locals to switch their livelihood. Some have become workers at plantation companies.

Public consultation was attended by representative of subregency, village secretary, head of custom, Youth Leader, Demang, and ISPO Staff. Since 2010, the locals have abandoned shifting cultivation with slash and burn method in favor of permanent cultivation. Fewer lands available for cultivation and the prohibition on burning forest and land are the main reason for the locals abandoning shifting cultivation. Decreasing rubber and rattan prices has pushed the locals to switch their livelihood. Some have become workers at plantation companies. Table 16 summarizes relevant findings during the public consultation.

Tabel 16. Summary of results from consultation with stakeholders on HCV assessment in the study area

Name; Title/Role; Organization/Social Group	**Main topic or issue & Assessment team's recommendation / response**
Mumut	• Informed the presence of gibbons, southern river terrapins, turtles, and alligators in rivers crossing the study area such as Keminting, Tilap, Sapiri, Hai, and Kawanbatu. • Orang utan could no longer be found in the study area. Orang utan is concentrated in Santuai Hill, which is outside of the study area. • Those turtles are mostly found in Berais River and Air Besar tributary. Assessment team's response: This additional information will enrich assessment result and strengthen the justification on the presence of HCV 1 area.
Subliansyah, Kapuk Village	• In the beginning, various animals such as Orang utan, gibbons, and deer could be found in forest area near the settlement and in the study area. • Ecosystem condition around Kapuk Village is still in good condition and able to support those animals. • Now, deer has extinct due to hunting. • Informed his encounter with beavers and lizards in several rivers in the study area. • Kawanbatu River is no longer viewed to be in good condition. • In the past, forest areas near the village were still in good condition, thus the air was still fresh. Now, however, the size of forest areas has decreased, thus causing the air to be hot. • Public consultation activity in communicating assessment results has never been done by other companies. Assessment team's response: This additional information will enrich assessment result and strengthen the justifications on the presence of HCV1 and HCV 3 areas. On the other side, when an area with good vegetation has been appointed and endorsed as an HCV area, then it would be better if the locals can participate in preserving the area as the habitat for important and endangered animals. The study area is located in the center of several sub-watershed of

Name; Title/Role; Organization/Social Group	Main topic or issue & Assessment team's recommendation / response
	Keminting, Tilap, Sapiri, Hai, and Kawanbatu. Such condition requires a big commitment from the company in managing riverbank areas. Thus, integration and commitment from all relevant parties including village officials and the locals are necessary on the importance and protection of riverbanks. Regency officials need to consider various conditions when granting a permit to operate a plantation.
Hartono Damang, Mentaya Hulu District, Kuala Kuayan sub-regency	• Preservation of important, rare, and protected animals requires vegetation and wide forest area. Forest area in the study area is located at around the riverbanks. • An area in Tanjung Jerangau, which is outside of the study area, still has a wide forest area. The area at times can still support the presence of Orang utan. • Repairing Bakung River, which is known by the locals as Hai River. • What is the distance of palms to the river? • Presentation on HCV assessment process at PT KMA is very interesting and a new thing for us. Information on the importance of river and its riverbank. Around 6% of riverbank in the study area must be preserved. However, the river is already in a bad condition. • Currently, old shrubs around the riverbanks need protection. Thus, there needs to be an ultimatum from the regency officials to all parties saying that riverbank areas are not to be opened. • Sometimes the presence of rare and endangered animals are more important than human lives. Currently, the locals need food, thus they are in need of jobs. The locals' livelihoods from rubbers and rattans are no longer dependable due to their low market prices. • PT KMA has given many contributions for community development. • Several other companies have never conducted this type of socialization when there will be land clearing. This type of activity should be conducted by other companies prior to conducting land clearing. Assessment team's response: • This additional information will enrich assessment result and strengthen the justifications on the presence of HCV areas, especially HCV 1 and HCV 4 areas. • Planting distance of palms around the river would be better outside of riverbank areas. Measuring the width of riverbanks should be based on the rivers' morphometric condition. • Even though the rivers are viewed to be in bad condition, but their presence still has the role and the function to control flooding and sedimentation. • HCV 4 areas that are providing ecosystem service are still in good condition. Palms around the riverbanks need not to be excavated when rehabilitation is conducted. • The most important points from the presence of HCV areas are their values

Name; Title/Role; Organization/Social Group	Main topic or issue & Assessment team's recommendation / response
	and functions. Utilization depends on field condition, thus commitment from all parties, which include several palm plantation companies in upstream region, is necessary. • Active role from Regency officials is necessary to coordinate HCV areas management and most certainly commitment from PT KMA by conducting HCV assessment.
Heriyanto, Pemantang Village	• There are many field facts relevant with managing riverbanks that habe been opened. Assessment team's response: According to existing laws and regulations, riverbanks are locally protected areas whose presence is very important to control flood, erosion, and sedimentation. Punishments will follow suit for violation. When land clearing has already been conducted in riverbank areas, then rehabilitation must be conducted.
Heriyanto, Pemantang Village	• Currently, 50% of wood needs are acquired through purchase. Woods from nature are located in riverbanks and in lands belonging to the locals. • In the beginning, the locals caught fishes from the rivers. Now, however, fishes are acquired through purchase. • Currently, the locals' enterprise activity comes from animal husbandry. • In the beginning, rivers around the study area were the habitat for Pangolins, turtles, and otters. Most likely those animals are decreasing in numbers due to poaching by the locals. • In the beginning, the presence of Ulin had supported cultural activities of the locals. Now, however, acquiring large size Ulin wood in the study area is very difficult. Assessment team's response: Thank you for the information, which supports the indications of the presence of HCV 1 and HCV 6.
Hartono Damang, Mentaya Hulu District, Kuala Kuayan sub-regency	• What will happen to HCV areas that are located in lands belonging to the locals? • The locals would like to keep those lands; if there is no compensation, then the locals would be able to utilize those lands. What are the solutions? Assessment team's response: There must be a discussion with land workers and land owners to come to an agreement on managing lands that have been appointed and decreed as HCV areas. There are several options with land purchase and other incentive formats for partnership in managing those HCV areas.
Sardilin, Kuala Kuayan Districts' Secretary	• In the beginning, we had difficulties in understanding the process and the result of HCV assessment at PT KMA. Now, however, we can understand them clearly. • We have to a realization on the presence of HCV 1, HCV 3, HCV 4, and HCV 6 areas in the study area. Such realization makes a very perfect sense and

Name; Title/Role; Organization/Social Group	Main topic or issue & Assessment team's recommendation / response
	there can be no agricultural activities in those areas. • Every village must be informed on areas that will not receive compensation. Thus, every village must have a record on land status and ready to provide an explanation to the villagers. Assessment team's response: Thank you for your attention and acceptance on HCV assessment and process in the study area.

From participatory mapping, the locals in general have interests on the utilization in the concession area. There is no custom land being used communally. Villagers of Pemantang have received compensation for their lands.

Based on the statements made by the locals whom have released their lands to the company, the decision to release their lands was done freely. There were no manipulations nor pressures from the company to the land owners. The locals prefer to release their lands to the company if the compensation value can come to an agreement.

Representatives of villagers from Pemantang, Pahirangan, and Tangka Robah view that compensation process previously undergone is rather fast. The process took more or less 3 years to complete. However, the locals felt that they had enough time to make proper decisions.

The locals have known the presence of PT KMA since 2005 through the company's socialization. Villagers from Tangka Robah had at first rejected the presence of PT KMA. The rejection was simply caused by the limited information accessible by the villagers.

The company, village and districts administrations, land owners, and regency's land agency were all involved in the making of compensation agreement. The agreement has been documented and is legally binding.

Table 17 shows the first page of PT KMA's SOP regarding procedure to settle land disputes. The SOP explicitly states that an agreement must be reached with respect to FPIC principles. Lands to be acquired will be purchased at market price. All agreements must be documented and witnessed by authorized government agency, head of village, and the company's representative.

Table 17. SOP PT KMA #26 (Procedure to settle land disputes)

Sustainability Standard Operating Procedures (SOP)	Number of issuance	3
	Issued date	July 1, 2014
SOP 26. Procedure to resolve land dispute	Revised date	Aug 1, 2013
	Page	1 of 5

Topic	**Detail**
A. Land dispute / boundary	- When in dispute with the community or stakeholder neighboring with the plantation, early negotiation would be handled by Manager with the defendant. - When negotiation fails, manager will consult with GM. - Official surveyor would be invited/brought to visit the area under dispute. Survey would be conducted as a way for participatory consultation with the defendant. - When negotiation based on surveyor's data or land deed fails, this matter would be referred to the local government, which would be the Agrarian Department. Manager will provide data/a collection of information from surveyor/land deed to support the case. - The defendants have the right to appoint their representative in the negotiation process. - Legal action would accompany every failure in the above procedure. Negotiation outside of court proceedings could still be conducted at this point. - When negotiation is successful, boundary stone must be placed under the witness of all parties involved. - Suitable time would be provided to the defendant to make a decision. - Negotiation agreement is reached freely and voluntarily (without force) based on information exchange and consultation (FPIC). - Every agreement signing and/or compensation payment must be witnessed by the authorized government agency, Head of village, and the company's representative. - Agreement reached must bind all relevant parties and can be used as an evidence in court proceedings. - All negotiation processes must be documented.
B. Squatter disputes	- Plantation is responsible to collect information such as size of land under dispute, length of problem (how long it has happened), and other relevant

	information or supporting document for the case. - All information and evidences will be handed to GM for the next step of action. - Action is usually in the form of negotiation, legal action or both. - Resolution proposed in negotiation process covers: (1) Remove the defendant from the area under dispute. (2) Compensation payment to the defendant (3) Relocating the defendant to another location offered by plantation management (in this case, the defendant will pay land compensation using market price). (4) The company will allow the defendant to pay a certain nominal amount (token) of land under its care and bear all administrative costs as part of CSR.

In conclusion, PT KMA has implemented FPIC when acquiring the lands to develop its oil palm plantations. The locals whom previously owned the acquired lands have made their decisions freely with sufficient time. The company has socialized its planned activities and compensation procedure to the locals. The locals all have a positive view on the company and are all very eager to be working together.

4. Summary of Management Plans

4.1. Team Responsible for Developing Management Plans

The following are personnel who are responsible for developing management plan:

a. Mr. Abdul Rahman Hj. Otman: Production Director
b. Mr. Stephen Tiong: Head of Sustainability of KLK Indonesia
c. Mr. Kanapathi Rao: GM KLK Kalimantan Tengah
d. Mr. Taharudin: Group Manager PT KMA
e. Mr. Lin Ting: Head of Sustainability Kalteng

4.2. Elements to be Included in Management Plans

4.2.1. Elements of SEIA

1. Management measures
    a. To consolidate all elements of PT KMA related to management of social issues.
    b. To develop a participatory integrated social management plan as a responsibility of the company toward social condition.
    c. To adopt system application and documentation procedure to support comprehensive communication according to the standard of KLK Group and RSPO.
    d. To reexamine, to record, and to apply things related to social management.

2. Mitigation measures
    a. To better formulate external activities to promote a closer relationship and togetherness feeling between the company and local community.
    b. To CSR programs on the integration of land acquisition and welfare improvement of local community.

4.2.2. Elements of HCV

1. HCV management area
   Indicative HCV management area covers 175.1 ha (Fig 9).

2. Management recommendation
    a. HCV 1 and HCV 3
        i. To protect and maintain scrub vegetation over riverbank of Keminting, Tilap, Sapiri, Hai and Kawanbatu Rivers.
        ii. To educate local people regarding the importance of scrub vegetation over riverbank.
        iii. To install sign board containing the presence of the HCV areas.
        iv. To promote partnership and mechanism of land management around riverbank with land owners.
    b. HCV 4
        i. To delineate and demarcate the HCV 4s, which are riparian areas within which the HCV 1 and HCV 3 are included, and other riparian areas in the concession.
        ii. To build ditches to enhance water retention, mainly in the Central parts of KMA's concession.
        iii. To build gully plug to capture sediment.
        iv. To plant cover crops on the riverbank followed by planting fast growing tree.
        v. To develop stardard operating procedure (SOP) regarding the management of riverbank.
        vi. To install sign board warning the danger of forest fire.
        vii. To regularly monitor the risk of forest fire.
        viii. To promote partnership and mechanism of land management around riverbank with land owners.
        ix. To take vigilant measures in applying chemical materials in the plantation close to the riparian areas
    c. HCV 6
        i. Management of physical components is the same as the one of HCV 4.

ii. To encourage local people to materialize village regulation regarding protection of sacred site, which is honored by community of Dayak Ngaju.

3. Monitoring option
    a. To regularly monitor the presence of Uwa-uwa and other RTE wildlifes.
    b. To record any event of HCV degradation or decline.
    c. To monitor periodically water level, particularly in the areas that are frequently flooded.
    d. To monitor the progress of village regulation regarding protection of riverbank and sacred site.
    e. To monitor application of chemical materials in the places close to the riverbank that have been established as HCV areas.

4.2.3. Elements of Carbon Stock and GHG Emission

1. Elements of management and mitigation plan

Fertilizers and POME are the main source of the overall GHG emission in the PT KMA proposed new development. In an effort to mitigate greenhouse gas emission, however, PT KMA management plans to reduce the use of fertilizer by 10% (**Table 18**). The selected scenario will reduce the overall GHG emission according to the projected plantation cycle by nearly 50%.

Table 18. Reduction of the use of fertilizer and the projected GHG Emission according to the selected scenario

Fertilizer	Baseline		Selected Scenario		Emission Reduction	
	Amount (t/ha)	Overall Emission (t CO_2e)	Amount (t/ha)	Overall Emission (t CO_2e)	(t CO_2e)	(%)
GRP	0.15	382.4	0.13	193.1	189.3	49.5
NPK	4.32		3.69			

The underlying rationales of selecting the scenario are listed below:

a. Designing of the use of fertilizer is part of the development plan, which can be immediately designed before the development.
b. Reduction by 10% of the use of fertilizers results significant reduction of the projected GHG emission for the one cycle of the proposed new plantation. Higher reduction of the fertilizer use to reach lower and/or negative emission has been considered, however, it will also effects the productions and the feasibility of the plantation. Therefore, the selected scenario is considered as the optimal plan to ensure the sustainability for the environment and the business.
c. POME treatment has been considered as one of the efforts to significantly reduce the

projected GHG emission. However, it would need further development of the facility and may not be effective and optimal during the first cycle of the proposed new plantation, thus it is considered not to be taken in the immediate decision.

d. Reduction of 10% of the use of fertilizers results 50% of the projected overall GHG emission.

2. Monitoring plan of the implementation of selected scenario

Plan for monitoring reduction of inorganic fertilizer use:

1. Monitoring the establishment of the mitigation plan in the plantation operation plan.
2. Monitoring the projected amount of fertilizers will be used according to the mitigation plan.
3. Monitoring the stock and the use of fertilizers in specific period.
4. Monitoring the action taken for non-conformity.

5. Internal Responsibility

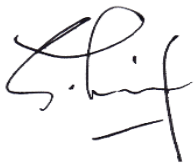
Formal Sign-off by Assessors and Company

This document is the Summary of HCV (High Conservation Value) and Social Environmental Impact (SEIA) Assessment of PT KMA

HCV Assessors & SEIA Assessors

Iwan Setiawan
(Team Leader)
Date: 28/8/2017

Management of PT KMA

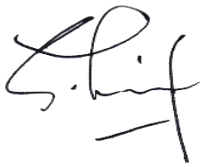


Stephen Tiong Mee Ing
(Head of Sustainability)
Date: 28/8/2017

Statement of Acceptance of Responsibility for Assessments

The Assessment Result of the High Conservation Value (HCV) and Social Environmental Impact (SEIA) Assessment of PT KMA by Aksenta will be applied as part of the guidelines in developing and managing PT KMA.

Management of PT KMA



Stephen Tiong Mee Ing
(Head of Sustainability)
Date: 28/8/2017

Referrence

Aksenta. September 2016. Laporan Tinjauan dan Pembaharuan Pengelolaan dan Pemantauan Area High Conservation Value. PT. Karya Makmur Abadi. Kabupaten Kotawaringin Timur. Kalimantan Tengah, Indonesia

Aksenta. September 2016. Laporan Kajian Cadangan Carbon (Carbon Stock Assessment). PT. Karya Makmur Abadi (Areal Rencana Pengembangan). Kabupaten Kotawaringin Timur. Kalimantan Tengah, Indonesia. Laporan Akhir.

Aksenta. October 2016. Laporan Kajian Dampak Sosial (Social Impact Assessment). PT. Karya Makmur Abadi. Kabupaten Kotawaringin Timur. Kalimantan Tengah, Indonesia. Full Assessment. Final.

Aksenta. October 2016. Laporan Kajian Free Prior Informed and Consent (FPIC). PT. Karya Makmur Abadi. Kecamatan Mentaya Hulu, Kabupaten Sampit. Kalimantan Tengah, Indonesia.

Aksenta. September 2016. Greenhouse Gas Assessment For New Planting. PT. Karya Makmur Abadi. Kecamatan Mentaya Hulu, Kabupaten Kotawaringin Timur. Provinsi Kalimantan Tengah. Full Assessment. Final

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

Colchester, M. 2010. *Free, Prior and Informed Consent: Making FPIC Work for Forests and Peoples. Scoping paper prepared for TFD's FPIC Initiative*. A TFD Publication, Number 11. The Forests Dialogue, Yale University. New Haven, Connecticut, USA.

Evans. T, N Judd, R Nussbaum, S Jennings. 2003. High Conservation Value Forest toolkit. Proforest

Forest Peoples Programme. 2008 (October). *Free, Prior and Informed Consent and the Roundtable on Sustainable Palm Oil: A Guide for Companies*. Forest Peoples Programme. Moreton-in-Marsh, England, UK.

CITES. 2016. Appendices I, II and III valid from 10 March 2016. UNEP, Geneva, Switzerland (http://www.cites.org/eng/app/appendices.php).

IPCC. 2006. IPCC guidelines for national greenhouse gas inventories. Prepared by the National Greenhouse Gas Inventories Programme. Eggleston HS, Buendia L, Miwa Km Ngara T and Tanabe K (eds.). IGES. Japan.

IUCN, 2015. *Red List of Threatened Species.* Version 2014.3. <www.iucnredlist.org>. Downloaded on 12 Mei 2015.

Konsorsium Revisi HCV Toolkit Indonesia. 2008. Panduan identifikasi kawasan benilai konservasi di Indonesia. Jakarta.

Manuri, S., C.A.S. Putra dan A.D. Saputra. 2011. Tehnik Pendugaan Cadangan Karbon Hutan. Merang REDD Pilot Project, German International Cooperation – GIZ. Palembang

SNI 7724. 2011. Pengukuran dan penghitungan cadangan karbon –Pengukuran lapangan untuk penaksiran cadangan karbon hutan (*ground based forest carbon accounting*). BSN–Badan Standarisasi Nasional, Indonesia.

SNI 7645. 2010. Klasifikasi Penutupan Lahan. BSN – Badan Standarisasi Nasional, Indonesia.

RSPO. 2007. *RSPO Principles and Criteria for Sustainable Palm Oil Production.*

RSPO. 2012. Carbon Assessment Tool for New Oil Palm Plantings-Version June 2014. RSPO.

RSPO. 2014. Carbon Assessment Tool for New Oil Palm Plantings-Version June 2014. RSPO.

UN-REDD Programme. 2013. *Guidelines on Free, Prior and Informed Consent*. UN-REDD Programme. Geneva, Switzerland.