Summary Report submitted for the HCS Approach Peer Review Process

HCS Study Project Title: High Carbon Stock Assessment of PT Sukajadi Sawit Mekar, Central Kalimantan, Indonesia

Company/Organisation: Musim Mas
Contact person: Dr Gan Lian Tiong
Date: 3rd August 2018
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1. Project description

1.1 Location and size of study area

Musim Mas (MM) is a large-scale, integrated, and industrial producer of palm oil in Indonesia. It has over 141,000 hectares of planted oil palm, these plantations are located in Sumatra and Kalimantan. MM has been a member of the RSPO since 2004 and has been a member of the Palm Oil Innovation Group (POIG) since November 2015. The company has committed to producing palm oil sustainably and has RSPO certification for all its oil palm plantations.

PT Sukajadi Sawit Mekar (PT SSM) is part of Musim Mas Group. PT. SSM achieves yields in the order of 26 tonnes of fresh fruit bunches per hectare annually. The plantation operates on a concession license and does not have any plasma areas or buy FFB from smallholders in the area.

Key commitments that PT SSM has made to sustainability that are relevant to HCV are:

- **As part of the land development plan, the Sustainability Department will first conduct an internal HCV assessment to map out potential HCV sites or primary forests. We do not develop primary forests or any areas that contain one or more HCVs.**

- **Once HCV areas are mapped out within the concession, we engage external HCV consultants to verify these potential HCV areas and identify other areas that may have been overlooked. In accordance with the RSPO guidelines, we only engage HCV Assessor Licensing Scheme (ALS) accredited assessors.**

- **The agreed area of land will only be developed in consultation with stakeholders such as local communities, local government agencies and non-governmental organisations.**

- **When the internal and external parties have agreed on the HCV areas, our Sustainability team will develop a management and monitoring plan to safeguard these areas. (MM, 2017)** Additionally, as a member of POIG it has made the following commitments that are very relevant in this landscape:

  1.7 Water accountability: The quality and quantity of water is maintained with responsible water management adopted including minimization and disclosure of water use, pollution elimination, equity with other users, and consideration of catchment level impacts of irrigation.

  1.8 Protect and conserve wildlife: Following comprehensive biodiversity surveys to identify HCV 1-3, in addition to ensuring the protection and survival of all rare, threatened or endangered species within their concession land, concession holders also make a positively contribution to their survival in the wild in areas beyond the concession.
PT SSM is now looking to implement the commitments. In August 2017 PT SSM engaged PT Daemeter Consulting to conduct both an HCV and HCS Assessment on the plantation. The HCS assessment was undertaken using the version 2 of the HCS toolkit (May 2017). However, this pre-dated the requirement for integrated HCV / HCS assessments.

Subsequently PT SSM has contracted PT Hijau Daun Konsultan to prepare this submission for the HCSA. The reason for the change in companies was to maintain the same assessor. The key objectives for PT Hijau Daun Konsultan are as follows:

1. To identify areas considered to qualify as High Carbon Stock (HCS) forest under the 2017 HCS Toolkit - the so-called “no go” areas which should be conserved under HCS guidelines.
2. To document the process of free, prior and informed consent (FPIC), which was used in negotiations with communities regarding land sales and land-use planning.
3. To integrate the Participatory Mapping into the HCS patch analysis process.
4. Preparation of an Integrated Conservation and Land-use Plan (ICLUP), integrating the findings of HCS, HCV, peat areas and inputs from community consultation.
5. Provide recommendations for effective integrated monitoring and reporting of ICLUP plans and other conservation commitments.
6. Assist PT SSM to communicate results of the HCV and HCS project to external stakeholders, including the HCS Steering Committee and to provide answers to comments and clarifications that are asked by the Peer Reviewer.

The project is located in Kotawaringin Timur District, Central Kalimantan, Indonesia. The concession is divided by the Sampit, Bengkariang and Binti Rivers. This concession is approximately 50 km from Sampit, the largest town in the immediate area. Sampit has a small airport.
Figure 1. Location of PT. SSM in Central Kalimantan Province. This is located in the Mentaya watershed, on Borneo Island, Indonesia.
1.2 Overview of proposed plantation development

A location permit was first obtained by PT SSM in the area in 1994. Plantation development started in 2001. Development pre-dated government requirements\(^1\) to set aside a proportion of the plantation as plasma. Consequently, the whole area of PT SSM is nucleus.

Table 1. List of legal documents and regulatory permits obtained by PT SSM

<table>
<thead>
<tr>
<th>No.</th>
<th>License / Recommendation</th>
<th>Issued by</th>
<th>Number</th>
<th>Area (ha)</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Deed of Establishment</td>
<td>Notary H. Asmawel Amin, SH</td>
<td>No. 108</td>
<td></td>
<td>25 January 1994</td>
</tr>
<tr>
<td>2</td>
<td>Location Permit</td>
<td>Regent of Kotawaringin Timur</td>
<td>No. 1068.460.42</td>
<td>±15.000</td>
<td>10 October 1994</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Regent of Kotawaringin Timur</td>
<td>No. 193.460.42</td>
<td>±16.300</td>
<td>12 March 2004</td>
</tr>
<tr>
<td>3</td>
<td>Extension of Location Permit (if relevant)</td>
<td>Regent of Kotawaringin Timur</td>
<td>No. 1020.460.42</td>
<td>±15.000</td>
<td>20 October 1995</td>
</tr>
<tr>
<td>4</td>
<td>License that the area is suitable for an oil palm and factory.</td>
<td>Regent of Kotawaringin Timur</td>
<td>No. 660/1278/BLH-Ek.SDA/2015</td>
<td>19.802,334</td>
<td>29 May 2015</td>
</tr>
<tr>
<td>7</td>
<td>Land Use Title (HGU)</td>
<td>National Land Agency Kotawaringin Timur</td>
<td>No. 12</td>
<td>7.416,074</td>
<td>16 October 1999</td>
</tr>
<tr>
<td></td>
<td></td>
<td>No. 27</td>
<td>12.386,27</td>
<td>28 April 2005</td>
<td></td>
</tr>
</tbody>
</table>

\(^1\) Permentan 26 Tahun 2007
1.3 Description of surrounding landscape

The surrounding landscape in this discussion is defined as the Mentaya Watershed. This is mapped in Figure 1. This area was once heavily forested and is part of Sundaland Heath Forests eco region. This ecoregion is described by Wikramanayake et al, 2002 as:

“made up of heath forests scattered throughout Borneo on raised beaches, sandstone plateaus, and ridges. Heath forest is found on well-drained acidic soils (pH less than 4) with a low clay content, derived from siliceous rocks under ever-wet conditions. These soils are commonly called white-sand soils. A layer of peat or humus often covers these soils but is lost once the natural vegetation is cleared.

Heath forest soils degrade very quickly to bleached sand once the forest cover is removed, making this type of forest extremely fragile. Periodic water stress and lack of available nutrients may be important in the formation of this forest, which is notoriously poor for agriculture.”

1.3.1 History of forest disturbance in the region, drivers of deforestation

Zooming into the area surrounding PT SSM. Two logging companies operated in this area, PT Kayu Mas (1977-2005) and PT Inhutani III (1984 -1996). These companies opened the forest in this area. By 2004 much of the non-swamp areas had been converted to community-based agriculture or rubber. After 2005 large scale agricultural business licenses were granted over the area has been steadily developed for oil palm.

Logging (whether industrial or community based) and transmigration to this area have pre-disposed this area to fires. These fires have burnt vast areas in el-Nino years both in and around PT SSM. Community interviews with people aged 40 or above within this area described it as a forested area with swamps, lakes and small streams. The rivers rose and fell slowly with the change in seasons. Describing the area now, they state that all the forests are confined to inaccessible wet areas, the swamps and lakes are gone and the rivers now rise and fall rapidly, this exacerbates the effects of flood and drought.

Figure 2 shows the forest cover within the Mentaya watershed (which is calculated as 17% forest cover). This forest cover data set predated the 2015 fires (the extent of these fires is mapped in Figure 3). As such the forest cover would be even less than 17%.
Figure 2. Hansen 2013 data (updated for 2015 - just before the fires). This shows that the once extensive forests in this area have now been reduced to isolated spots. These spots tend to be highly degraded secondary forest at best.
Figure 3. VIIRS hotspots for 2015 fires. This shows just how widespread the fires were in this area of Kalimantan during the 2015 el nino.
1.3.2 Land Use in the surrounding landscape

Subsistence Agriculture
Agricultural areas are mainly located near villages. Subsistence agricultural (slash and burn) is very much part of the Kalimantan culture. Within the last few years, as a result of the fires, slash and burn has now been banned. This leaves farmers in a dilemma as they now have to change their whole agricultural system. Options for land clearing are now considerably more expensive and largely out of the financial reach of the traditional farmer.

Rubber
Rubber tapping is also very much part of the Kalimantan culture. People have traditionally cleared land and planted rubber as a way of showing “use” and as such ownership. Very often the rubber is not tapped, or only tapped when prices are high. There are vast areas of jungle rubber which has very low productivity (but also low financial inputs are required) in comparison with an intensively managed rubber plantation.

Oil Palm
Oil palm is a newcomer to the landscape and large industrial growers dominate the landscape. However, for smallholders oil palm is becoming more popular. Compared with rubber the returns are much higher, but so are the capital and labour inputs. These factors limit the planting of oil palm in the landscape.

Forestry
Natural forestry or HPH concessions are mainly located in the headwaters of the Mentaya River. There are industrial tree plantations in the area. The main crop grown is Acacia mangium.

National Parks
The Tanjung Puting and Sebangau National Parks are located 80 km and 70 km respectively from PT SSM and are some of the last significant areas of natural forest in the south of Central Kalimantan.
Figure 4. Allocation of areas in the wider landscape. Oil Palm concessions dominate the plains with the occasional industrial forestry area (HTI). Natural forest logging concessions (HPH) are located in the upper reaches of the watershed of the Sampit or Mentaya river. The Sebangau National Park is located on the eastern border of this map and the Tanjung Puting National Park on the western border.
1.3.3 Biodiversity features and values

The flagship species of Borneo is the orangutan. This captures most of the research interest in the area. In reality, orangutans require reasonable areas of intact forest. As such the presence of orangutans is a proxy for the presence of other mammals as well as intact forest.

Additionally, the HCV assessment that was undertaken in the area identified:
- 42 mammal species that are threatened AND were sighted or mentioned as present in community interviews.
- 6 threatened tree species.
- 18 threatened bird species.

Clearly this was an extremely biodiverse area in the process of ecosystem decay. It is not clear how advanced this process is and how many local extinctions will result. The first group to leave the area are birds. All the forest birds that one would expect in this area (if it were still forested) are no longer present.
Figure 5. Orangutan habitat based on Wich et al 2008. This dataset was updated in 2013 and shows concentrations of habitat near Tanjung Puting NP and Sebangau NP. However, the distribution would be considerably more fragmented after the 2015 fires.
1.3.4 Peat Areas

PT.SSM uses the RSPO definition of peat which is:

“Tropical peat soils (Histosols) are defined as organic soils with 65% or more organic matter and a depth of 50 cm or more.” (Lim et al 2012)

The company has a Policy stating that “... There will be no new planting on peatland, regardless of depth.” Any peat areas are immediately considered “NO GO” for development. –PT SSM has undertaken a preliminary soil mapping exercise. The results of this are displayed in Figure 6. In key areas PT.SSM may undertake an additional peat mapping exercise.

Figure 6. Soils map as provided by PT.SSM. Note that the location of the peat area is significantly different from that in RePPProT. RePPProT maps the Barah land system which has thin lens of peat – this is reflected in PT SSM peat map. However, the Mendawai land system also has peat soils, but in the field, peat is absent in this area.
1.3.5 Ethnic groups, Religion and Culture

The community in these villages is surprisingly diverse. These are the main ethnic groups:

- Sampit
- Banjar
- Dayak (Ngaju, Katingan, Kahayan, Kapuas)
- Jawa
- Batak

The majority of the Sampit and Banjar people are Muslim. The Dayaks are mainly Hindu Kaharingan\(^2\), although a small proportion are Christian, catholic or Muslim. Jawa and Batak people have come from outside Kalimantan, they are Christian, catholic or Muslim.

Most villages are dominated by Muslims and the second biggest religion in the area is Hindu Kaharingan. Some villages have separated with Muslims living in one village and Hindu Kaharingan and Christian in another (e.g. Sebabi). This separation was explained in terms of different cultures and traditions (e.g. what is regarded by the various religions as being holy or otherwise). Although everything is harmonious and peaceful in the area.

Table 2: Ethnic groups, religion and culture. This information was obtained from interviews with the village heads (Kepala Desa) and leaders that are concerned with religious leadership (Tokoh adat).

<table>
<thead>
<tr>
<th>No</th>
<th>Village</th>
<th>Dominant Religion</th>
<th>Other Religion</th>
<th>Ethnic Group</th>
<th>House of Worship</th>
<th>Cultural celebration in the village</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Sebabi</td>
<td>Islam, Hindu</td>
<td>Christian, Catholic</td>
<td>1.Dayak (Temuan, Manyan, Kasongan)</td>
<td>Mosque, Basarah Hall, Church</td>
<td>Relevant to each religion, but the celebrations of Kaharingan are very strong</td>
</tr>
<tr>
<td>2</td>
<td>Tanah Putih</td>
<td>Hindu, Islam</td>
<td>Christian, Catholic</td>
<td>1.Dayak Ngaju 2.Sampit 3.Banjar, Jawa</td>
<td>Mosque, Basarah Hall, Church</td>
<td>Relevant to each religion, but the celebrations of Kaharingan are very strong</td>
</tr>
</tbody>
</table>

\(^2\) Kaharingan is a folk religion professed by many Dayaks in Kalimantan. The Indonesian government views it as a form of Hinduism because the Indonesian government recognizes only six official religions, and Kaharingan is not one of them. Prior to the arrival of major religious traditions and officially recognized by the Indonesian government, Dayak people had their own beliefs, called Kaharingan. Kaharingan’s beliefs contain the rules of life whose values and contents are not merely customs, but also teachings about how to behave. This Kaharingan faith has no scriptures and its teachings are delivered only orally and from generation to generation.

According to the Kaharingan belief, Dayaks believe in many gods around them, such as gods who dominate the land, rivers, trees, stones, and so on. Of the gods, there is a supreme deity, whose name varies between Dayak sub-tribes one to another, for example Dayak Ot Danum calls the supreme deity of Mahatara, while Dayak Ngaju calls it Ranying Mahatalla Langit. (Hindu Darma Council of Indonesia, 2017)
Planting of Jungle Rubber
A factor that is very important to this assessment is the way that land is considered to be owned in the local area. If a productive crop such as vegetables, oil palm or rubber is planted in the area, it is considered owned by the person that planted it. If the landcover is natural forest it is considered to be “not owned” and therefore can be claimed by anyone. Land is considered an important asset by the local community. For this reason, almost all the natural forest in the area has been cleared and planted with rubber. The rubber is not actively tapped (partly because of low prices), rather it is considered a stamp of ownership over the land.

Rubber is the preferred crop for this purpose because it requires very low capital input and potentially no maintenance. On the other hand, this has meant that the area has been stripped of natural forest and converted to an unproductive land use.

Land Cover
Land cover within the wider assessment landscape was once dominated by lowland rainforest. This consisted of a mixture of peat swamp forest, forest on mineral soils and riverine forest.

Since the 1960s vast tracts of land were allocated to logging concessions. Following this, once the timber resource was exhausted, oil palm concessions were allocated over many areas.

At the community level most of the easily accessible land on mineral soil has been converted to rubber plantations by the community, with a typical land holding of 2 – 3 ha per person. Mining also took place in this area, typically this was sand mining and gold mining3. This was very destructive to the environment and scars of mining operations can still be seen on satellite images. Other areas were farmed based on subsistence agriculture. Land is farmed for a number of years and then abandoned. New areas are cleared using fire. This is really the crux of the tragedy that has affected this landscape. Intact forest will not burn, but scrub and degraded forest is much drier and will burn in dry season. Since 1997 there have been a succession of fires on a massive scale during el nino years. These fires were largely started by traditional land clearing. The result of all the above factors is that the forest is highly fragmented. There is almost no intact forest in the landscape nor even any secondary forest in even moderate condition.

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3 Note the sand and gold mining took place outside the immediate vicinity of PT SSM
1.3.6 Important industries

The main industries in this area are agricultural industries. Particularly with reference to Figure 4, the main industry is oil palm. Forestry was once an important industry, but it has declined as the resource has become more scarce. Rubber has also been important in the past, but rubber prices have been very low for some time.

1.4 Map of the site within the region

There are two key biodiversity areas or protected areas in this landscape. These are the Sebangau and Tanjung Puting National Parks. These are located approximately 80 km and 70 km from PT. SSM respectively. The condition of the forest in these two areas is reasonably good. However, there are no intact forest corridors that connect forest within or near the concession with either of these two areas. This can be seen in Figure 2 where any forests outside these national parks have been reduced to isolated fragments.
Figure 7. Protected Areas in the region. The closest protected areas are the Tanjung Puting and Sebangau National Parks. These are both more than 50 km from PT SSM and there is no contiguous forest corridor that connects them.
1.5 Relevant data sets available

The following third-party satellite imagery was used in analysis and in the preparation of the report:

1. Sentinel 2 imagery. Data was captured October 2016 and February 2017 (although some areas were obscured by cloud). This
2. Landsat 8 imagery P104/R62. Data was captured April 2017.

Landsat 8 was used to gain an understanding of the vegetation present across the broader landscape. Subsequently, colour-balanced, raster-mosaics were created (using bands 6, 5 and 4 – which are suitable for vegetation analysis) and clipped to the relevant assessment area for analysis.

Sentinel 2 was used as the primary data source for land cover mapping. However, it proved difficult to get cloud free images that were recent over the assessment areas. Gap filling because of cloud cover was necessary and Landsat was used for this purpose. The dates of these images were October 2016 and February 2017.

A supervised classification technique was used where training regions were delineated in areas where the land cover was known. This was then extrapolated across the image using the “maximum likelihood classification” tool.

1.6 List of any reports/assessments used in the HCS assessment

1. Social and Environmental Impact Assessments (ANDAL) of the planned plantation development have been finalised dated 28th February 2009
2. High Conservation Value assessment which is still in the HCVRN review process.
2. HCS assessment team and timeline

2.1 Names and qualifications

<table>
<thead>
<tr>
<th>Name</th>
<th>Role</th>
<th>In Country Experience</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jules Crawshaw (M Bus Sys)</td>
<td>Assessment Leader (HCS Registered Assessor) – planning, data collection, analysis, report writing and mapping</td>
<td>6 years working in Indonesia with environmental related projects. Jules’ main focus has been HCS and HCV assessments.</td>
</tr>
<tr>
<td>Kursani Sumantri</td>
<td>Data Collection</td>
<td>30 years working as a field assistant specialising in vegetation assessments.</td>
</tr>
<tr>
<td>Daryatun Ridwan</td>
<td>FPIC and community Engagement</td>
<td>30 years working in Indonesia on environmental related projects.</td>
</tr>
<tr>
<td>Indrawan Suryadi</td>
<td>HCS Review (HCS Registered Assessor)</td>
<td>20 years working in Indonesia on environmental related projects. GIS and Remote Sensing Expert.</td>
</tr>
</tbody>
</table>

2.2 Time period for major steps in the study

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
<th>Current Progress</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>HCV assessment and initial draft of HCV report</td>
<td>August- October 2017</td>
</tr>
<tr>
<td>2</td>
<td>HCS field work</td>
<td>21-31 August 2017</td>
</tr>
<tr>
<td>3</td>
<td>HCS Draft (to the patch analysis stage).</td>
<td>1 September – 30 November 2017</td>
</tr>
<tr>
<td>4</td>
<td>Finalisation of the HCS Report (to the patch analysis stage)</td>
<td>30 November 2017</td>
</tr>
<tr>
<td>5</td>
<td>Finalisation of the HCV Report</td>
<td>7th December 2017</td>
</tr>
<tr>
<td>6</td>
<td>Free Prior and Informed Consent Process (FPIC)</td>
<td>21 August – 17 November 2017</td>
</tr>
<tr>
<td>7</td>
<td>Integration of HCV and FPIC into HCS</td>
<td>January – May 2017</td>
</tr>
<tr>
<td>8</td>
<td>Development of an Integrated Conservation Land Use Plan (ICLUP) based on the results of the FPIC and the HCS / HCV reports</td>
<td>January – May 2017</td>
</tr>
<tr>
<td>9</td>
<td>Submission of report to HCS for peer review</td>
<td>June 2017</td>
</tr>
</tbody>
</table>
3. Community engagement/ FPIC

3.1 Summary of community engagement, FPIC, participatory mapping

The basis of community engagement in PT SSM is a number of Standard Operating Procedures:

- Standard Operating Procedure (SOP/Plant.Div/5.5 dated 4/1/2016) describes the process of FPIC within Musim Mas. In summary, it outlines the steps for communicating with the community. It starts out with (1) understanding the location of areas that are owned by community members, then (2) the company explains the plans of the company to the community. Whilst it can be persuasive they cannot use intimidation or pressure. Following this (3), if the community rejects the company, their decision must be respected and the company should withdraw. If the community accepts the company, an agreement should be drawn up between the company and the community.

- Following this (4), the process of ganti rugi (or land purchases) can start. The ganti rugi process is covered in the following SOP (SOP/Plant.Div/1.0 dated 12/02/2018). At the time of development PT SSM only bought developable land. However, this caused problems with an inability to protect HCV areas because they didn’t understand them.
### Table 3. Summary of community engagement to date.

<table>
<thead>
<tr>
<th>No</th>
<th>Date / Time</th>
<th>Event</th>
<th>Village</th>
<th>Number of Attendees</th>
<th>List of Attendees</th>
<th>Description</th>
</tr>
</thead>
</table>
| 1  | 09.00 WIB – 11.00 WIB / Monday, 30 November 2015 | Stakeholder Consultation PT Sukajadi Sawit Mekar in 2015 | Sebabi, Kenyala, Tanah Putih Villages | 34 persons | 1. Management of PT.SSM:  
   2. General Manager Humas PT. Sukajadi Sawit Mekar  
   3. General Manager PT. Sukajadi Sawit Mekar  
   4. Estate Manager PT. Sukajadi Sawit Mekar  
   5. Askep Humas PT. Sukajadi Sawit Mekar  
   6. Staff Humas PT. Sukajadi Sawit Mekar  
Total attendees from the management 17 persons | 1. **Topic of Discussion**:  
1. Policy and Procedure on Land Compensation  
2. Policy and Procedure on External Complaint and Grievance  
3. Policy and Procedure on Community Development  
4. Other relevant policy and procedure  
5. Social and environmental impact assessment (AMDAL)  
6. Social Impact Assessment (SIA)  
7. High Conservation Value (HCV)  
8. P&C RSPO  
9. P&C ISPO  
10. Discussion session  

   2. **Objective**:  
1. Inform the stakeholders regarding the applicable and relevant policies and procedures as a form of company’s commitment to transparency.  
2. To maintain and improve communication between the company and the stakeholders  
3. To consult and discuss with the stakeholders regarding the development of the surrounding area  

   3. **Result**:  
1. Mr. Yohandi (Tanah Putih Village):  
“What is companies contribution to help the community to be able to open the land without using fire? Because this method is the common one used by the community”
6. Police of Simpang Sebabi
7. Danposramil
8. BPD Desa Sebabi
9. BPD Desa Kenyala
10. BPD Desa Tanah Putih

Attendees from the Community is 17 persons

- **Response**:
  “It is the responsibility of all of us together with the government and community and to be aware of the relevant law.”

2. Mr. Lingai (Secretary of Tanah Putih Village):
“We would like to ask the company to help to facilitate the access from Dusun Dukuh Sati, the proposal has been provided to the company.”

  - **Response**:
    “Yes we have received the proposal and it is currently being reviewed and analysed. The next step would be to conduct field checking”

3. - Mr. Dematius SH (Community of Sebabi Village):
“During dry season, like last month, there are lots of fire incidents. Therefore, we hope the company could help us to provide fire extinguish equipment to the village in order to handle the fire outside the concession”.

  - **Response**:
    “Yes, we will analyse this request and provide help to the community.”

**SUMMARY** : All attendees understand and approve the content and topic of the socialization by the company.
<table>
<thead>
<tr>
<th>2</th>
<th>09.00 WIB – 11.00 WIB / Monday, 28 November 2016</th>
<th>Stakeholder Consultation PT.Sukajadi Sawit Mekar In 2016</th>
<th>Sebabi, Kenyala, Tanah Putih Villages</th>
<th>33 persons</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Management PT SSM</td>
<td>• <strong>Topics of Discussion</strong> :</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. General Manager Humas PT. Sukajadi Sawit Mekar</td>
<td>• Policy and Procedure on Land Compensation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. General M PT. Sukajadi Sawit Mekar</td>
<td>• Policy and Procedure on External Complaint and Grievance</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Estate Manager PT. Sukajadi Sawit Mekar</td>
<td>• Policy and Procedure on Community Development</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Askep Humas PT. Sukajadi Sawit Mekar</td>
<td>• Other relevant policy and procedure</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Staff Humas PT. Sukajadi Sawit Mekar</td>
<td>• Social and environmental impact assessment (AMdal)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total attendees from the company is 18 persons.</td>
<td>• Social Impact Assessment (SIA)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Masyarakat / Undangan</td>
<td>• High Conservation Value (HCV)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Perwakilan Kecamatan Telawang</td>
<td>• P&amp;C RSPO</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Damang Kepala Adat Kecamatan Telawang</td>
<td>• P&amp;C ISPO</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Kepala Desa Sebabi</td>
<td>• Discussion session</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Kepala Desa Kenyala</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Kepala Desa Tanah Putih</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Kapolsubsektor Simpang Sebabi</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Danposramil</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. BPD Desa Sebabi</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Objective**

- Inform the stakeholders regarding the applicable and relevant policies and procedures as a form of company’s commitment to transparency.
- To maintain and improve communication between the company and the stakeholders
- To consult and discuss with the stakeholders regarding the development of the surrounding area

**Result**

- Mr. Dematius SH (Community of Sebabi Village)

“The company has been paying the land compensation in a correct and timely manner. However, before land clearing is being conducted, it will be better if the bordering land owners could be invited to inform them about the land and to avoid land conflict in the future.
### 3rd December 2017

**Stakeholder Consultation PT. Sukajadi Sawit Mekar in 2017.**

**Location:** Sebabi, Kenyala and Tanah Putih Village

**Attendees:** 24 persons

**Topics of Discussion:**
1. Policy and Procedure on Land Compensation
2. Policy and Procedure on External Complaint and Grievance
3. Policy and Procedure on Community Development
4. Other relevant policy and procedure
5. Social and environmental impact assessment (AMDAL)
6. Social Impact Assessment (SIA)
7. High Conservation Value (HCV)
8. P&C RSPO
9. P&C ISPO
10. Discussion session

**Objective:**
1. Inform the stakeholder regarding the applicable and relevant policy and procedure as a form of company’s commitment on transparency.

---

9. BPD Desa Kenyala
10. BPD Desa Tanah Putih

Total peserta masyarakat/undangan adalah 15 (lima belas) orang.

“Some of the roads in Sebabi village are not in good condition, it would be good if the company can help to fix the road”

Until now, there is currently not Batibung post yet, we therefore would appreciate if the company could facilitate to build the post”

- **Response:**
  “The request to invite the bordering land owners will be considered as that is a good advice. In regards to the road and the post, the community can provide the proposal to the office, as PT SSM will handle it from there”.

**SUMMARY:**

All attendees understand and approve the content and topic of the socialization by the company.
Community:
1. Representative from Telawang District
2. Customary Head of Telawang District
3. Head of Sebabi Village
4. Head of Kenyala Village
5. Head of Tanah Putih Village
6. Police Office of Simpang Sebabi
7. Danposramil
8. BPD Desa Sebabi
9. BPD Desa Kenyala
10. BPD Desa Tanah Putih
Total attendees from the community is 11 persons

2. To maintain and improve communication between the company and the stakeholders
3. To consult and discuss with the stakeholders regarding the development of the surrounding area

- **Result:**
  - Mr. Dematius SH (Head of Sebabi Village):
    “We thank the company for its contribution and the CSR Program by the company to the community. However, if possible we would appreciate if the CSR does not merge with the Village fund so it will not overlap too”
    “As for the smallholder program, we hope that there is transparency in the income and outcome of fund”

- **Response:**
  “Every year the company prepares the CSR program and consider the needs of the community. The program is approved by our management and after that we communicate the approved program with the community again.”
  “All the transactions and activity are recorded in the joint bank account. Every transaction cannot be done individually, it must be done with the Head of Village, BPD and acknowledged by the company”

**SUMMARY:** All attendees understand and approve the content and topic of the socialization by the company.
March 2018 Sawit Mekar in 2018.

Villages

- Sukajadi Sawit Mekar
  1. General Manager PT. Sukajadi Sawit Mekar
  2. Estate Manager PT. Sukajadi Sawit Mekar
  3. Estate Manager PT. Sukajadi Sawit Mekar
  4. Askep Humas PT. Sukajadi Sawit Mekar
  5. Staff Humas PT. Sukajadi Sawit Mekar

Sukajadi Sawit Mekar

Total attendees from the company is 13 persons

- Community :
  1. Representative of the Telawang District
  2. Customary Head of Telawang District
  3. Head of Sebabi Village
  4. Head of Kenyala Village
  5. Head of Tanah Putih Village
  6. Police Office of Simpang Sebabi
  7. Danposramil
  8. BPD Desa Sebabi
  9. BPD Desa Kenyala
  10. BPD Desa Tanah Putih

Total attendees from

- Objective :
  1. Inform the stakeholder regarding the applicable and relevant policy and procedure as a form of company’s commitment on transparency.
  2. To maintain and improve communication between the company and the stakeholders
  3. To consult and discuss with the stakeholders regarding the development of the surrounding area
  4. The company encourages the community to use above and ground water in a responsible and sustainable way
  5. To obtain input and comment from the community regarding the CSR Program in 2019.
  6. Provide information to stakeholders related to the compliance of laws and regulations applicable in the company.

- Result :
  - Mr. Dematius SH (Head of Sebabi Village):
    “How about the compensation to community land that is categorized as HCV area?”

“...”

“The company has not yet submitted the report of Kebun Kas Desa...”
<table>
<thead>
<tr>
<th>Community 25 persons</th>
<th>Sebabi for Semester II 2017”</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;The company has construct Embung Air, but apparently the Embung Air is not deep enough”</td>
<td></td>
</tr>
</tbody>
</table>

- **Response**:
  “HCV area is a shared responsibility. The company, community as well as the government must maintain and protect the existence of that area. Even though SSM can’t develop the HCV area SSM realise it has an economic value to the community.”

  “The report should be undertaken regularly per semester in a timely manner. We will take this as an opportunity for improvement for us”

  “We will discuss [the Embung Air] with the management to tackle that situation”

**SUMMARY**: All attendees understand and approve the content and topic of the socialization by the company.
3.2 Summary of Social Impact Assessment

An SIA was undertaken on this site. It was dated May 2008. This report did not identify any community areas to which the community have customary rights and which are important to them, for historical reasons, for their current and future livelihoods, for their cultural values, or for ecosystem service provision. Basically, it is assumed from the information provided in the SIA, that the whole area was for sale (this is not explicitly stated, the only information provided is that there are a small number of people that did not want to sell their land). No information is provided as to why small numbers of land owners did not want to sell their land. It is assumed the reason are personal and from the previously stated reasons related to their current and future livelihoods. For example, even areas with a sandung and a grave yard have had ganti rugi paid.
4. High Conservation Value assessment

4.1 Summary and link to public summary report

An HCV Assessment was carried out by PT Daemeter Consulting covering the concession area of 19,802 ha. Given the shape of the concession and its position in the watershed, HCV areas outside the concession are also identified. The report is still in the HCVRN review process. The report identifies an HCV area of 587 ha within the concession and 6500 ha external to the concession (7087 ha total). The areas and locations of the HCVs are identified in Table 4 and Figure 8 respectively. There are very few natural areas remaining in the concession, so the focus of the HCV was to make links with natural areas external to the concession. Unfortunately, most of the natural areas in the landscape had suffered heavily at the hands of community logging and fires that have swept through the area in el nino years. The focus of management and monitoring recommendations was developing management committees that would use the “Fire Free Village” model to not only focus on fire prevention, but also stop natural resources being plundered by the community.

Figure 8. Synthesis of HCVs - this includes HCV 1, 3, 4, 5 and 6 (HCVs 2 is not present).
Table 4. Area (ha) of each HCV by block. Also Non-HCV Area is provided.

<table>
<thead>
<tr>
<th>HCV</th>
<th>Inside SSM</th>
<th>Outside SSM</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>HCV 1</td>
<td>415.39</td>
<td>6,469.17</td>
<td>6,884.56</td>
</tr>
<tr>
<td>HCV 2</td>
<td></td>
<td>Not present</td>
<td></td>
</tr>
<tr>
<td>HCV 3</td>
<td>20.81</td>
<td>804.02</td>
<td>824.83</td>
</tr>
<tr>
<td>HCV 4</td>
<td>542.95</td>
<td>6,035.43</td>
<td>6,578.38</td>
</tr>
<tr>
<td>HCV 5</td>
<td>542.95</td>
<td>6,035.43</td>
<td>6,578.38</td>
</tr>
<tr>
<td>HCV 6</td>
<td>0.71</td>
<td>-</td>
<td>0.71</td>
</tr>
<tr>
<td>Total HCV Area(^4)</td>
<td>587.13</td>
<td>6,499.99</td>
<td>7,087.12</td>
</tr>
<tr>
<td>Total Non-HCV Area</td>
<td>19,214.87</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Area</td>
<td>19,802</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 5. Justification of HCV presence / absence

<table>
<thead>
<tr>
<th>HCV</th>
<th>Justification of HCV presence / absence</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>For all the vegetation, mammals and birds that were surveyed there are many threatened species. The habitats within and around the concession, at best are at the highly degraded end of secondary forest. Most frequent is scrub. These areas, where these threatened species are present AND the assessor considered some regeneration potential / connectivity with natural areas outside the concession are considered to be HCV 1. Tiny areas of remaining forest or natural areas that had been highly modified (e.g. by the digging of drainage canals or building of roads) were not considered HCV 1. For this reason, this element of HCV 1 was deemed present in the area.</td>
</tr>
<tr>
<td>2</td>
<td>There is no intersection between the assessment area with intact forested landscapes, nor are there any significant forested areas within or nearby PT. SSM. For this reason, HCV 2 is deemed Not Present.</td>
</tr>
<tr>
<td>3</td>
<td>Rare and / or endangered ecosystems are found in the assessment area. This is primarily focussed on riverine areas which form important corridors in the landscape. HCV3 is therefore deemed Present.</td>
</tr>
<tr>
<td>4</td>
<td>Numerous rivers and wetlands are present throughout and surrounding the assessment area. Additionally, there are wetlands and riparian areas in the assessment area which act to mitigate flooding, protect fisheries and filter the water which enters the rivers. Daemeter maps the HCV area to include all undeveloped wetlands and riparian buffers of 50 m on either side of rivers. This element of HCV 4 is therefore Present. The riparian buffers must be maintained to prevent riverside erosion. For this reason, this element of HCV 4 is deemed to be present.</td>
</tr>
<tr>
<td>5</td>
<td>The communities living in and around the assessment area are reliant on natural areas for meeting their basic needs. Of note are drinking water, timber for house construction and fish for eating.</td>
</tr>
</tbody>
</table>

\(^4\) These areas do not add up because of overlaps.
However, these resources have been decimated by a combination of exploitation and environmental destruction. Therefore HCV 5 is deemed Present.

The rivers and riparian areas are deemed HCV 5 because:
- The fish live in the rivers and breed in the riparian areas.
- The community catches fish in drains within the oil palm estate and the rivers.

Timber is harvested in the riparian forests. This was based on observations and village interviews.

| 6  | There is one sandung and one grave within the plantation areas that fit the HCV 6 criteria, therefore this HCV is deemed to be Present. There are also a number of sites in the local area (though outside PT SSM). |
5. Environmental Impact Assessment

5.1 Summary

An ANDAL (Environmental Impact Assessment) was undertaken for PT SSM over the full 19,802 ha. This document is dated 28 October 2005.

No area is recommended for conservation in this ANDAL. In many ways it is more a plan for development. A floral and faunal survey has taken place where many threatened species are identified as being present. As can be expected it was far more species rich before land clearing took place. Many of these species identified as present by the ANDAL are protected by PP 7/1999 tentang Pengawetan Jenis Tumbuhan dan Satwa (Government Regulation regarding Flora and Fauna Preservation).
6. Land cover image analysis

6.1 Area of Interest and how it was defined

The area of interest (AOI) is a combination of:
- the HGU boundary of PT SSM which is made up of three blocks.
- a 1 km buffer was drawn around the outside of the HGU boundary.

All areas within this AOI were classified.

6.2 Description of images used for classification

The goal of Phase One of an HCS assessment was to create an indicative map of potential HCS forest areas in the concession and its surrounding landscape, using a combination of satellite images and field-level data.

PT SSM was able to provide shapefiles of their infrastructure and planted areas. These were masked out of the image classification exercise because these areas were already “known” and didn’t require classification.

6.3 Sample image

Sentinel satellite images (Figure 9 - Figure 10) from PT. SSM were classified into homogeneous land cover classes. The date of the Sentinel 2 images was:

- February 2017, which was the most recent good quality image (although it is a little obscured by high cloud).
- October 2016, another, older better-quality image is used particularly to give coverage of the cloudy areas.

The focus was getting a most recent cloud free image over the whole of the AOI.

Table 6. Sentinel images that were used for remapping (shown in Figure 9 and Figure 10).

<table>
<thead>
<tr>
<th>Sentinel Scene</th>
<th>File</th>
<th>Acquisition date</th>
</tr>
</thead>
<tbody>
<tr>
<td>T49MFT</td>
<td>T49MFT_20161001_B1182</td>
<td>1 October 2016</td>
</tr>
<tr>
<td></td>
<td>T49MFT_20170208_B1182</td>
<td>8 February 2017</td>
</tr>
</tbody>
</table>
Figure 9. PT. SSM Sentinel image (February 2017). The pink areas are open or recently cleared land, yellow-green areas are oil palm and dark green areas are forest. This image is slightly obscured by high cloud.
Figure 10. PT. SSM Sentinel image (October 2016). The pink areas are open or recently cleared land, yellow-green areas are oil palm and dark green areas are forest. This image is clear except for some isolated clouds.
6.4 Method of stratification and software used

Sentinel-2 images (October 2016 and February 2017) were downloaded from U.S. Geological Survey (USGS) at EarthExplorer (http://earthexplorer.usgs.gov/). The bands that which used are 11-8-2 represent Short Wave Infrared-Near Infrared-Blue which suitable for vegetation mapping. This composite imagery has 10 m x 10 m pixels.

As part of image pre-processing step, geometric and radiometric correction were conducted for the segmentation process. The classification process was conducted using an object-oriented based classification method. The training regions for the classification were defined based on examination of high-resolution Google Earth images of the area and also the assessor’s experience with mapping of land cover elsewhere in Kalimantan. After the field visit, in-field observations, and in consultation with company staff, post classification was undertaken based on the actual condition.

Land cover was stratified into the standard HCS land cover classes as described in the HCSA toolkit v2.
6.5 Map of initial vegetation classes, with legend

Figure 12. Resulting (initial) forest cover map for PT. SSM that was used in the field for the assessment. Definitions and discussion of the land cover are provided in Table 13.
6.6 Table of total hectares per vegetation class

### Table 7. Final Mapping.

<table>
<thead>
<tr>
<th>Land cover class</th>
<th>Number of Hectares within the concession</th>
<th>% of total concession</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Potential HCS classes:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low Density Forest</td>
<td>55.23</td>
<td>0.28%</td>
</tr>
<tr>
<td>Young Regenerating Forest</td>
<td>206.36</td>
<td>1.04%</td>
</tr>
<tr>
<td><strong>Sub-total</strong></td>
<td><strong>261.59</strong></td>
<td><strong>1.3%</strong></td>
</tr>
<tr>
<td><strong>Non-HCS classes</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scrub</td>
<td>1055.00</td>
<td>5.33%</td>
</tr>
<tr>
<td>Open Land</td>
<td>393.86</td>
<td>1.99%</td>
</tr>
<tr>
<td>Jungle Rubber</td>
<td>43.88</td>
<td>0.22%</td>
</tr>
<tr>
<td>Oil Palm</td>
<td>17926.30</td>
<td>90.53%</td>
</tr>
<tr>
<td>Water</td>
<td>17.66</td>
<td>0.09%</td>
</tr>
<tr>
<td>Open Swamp</td>
<td>104.06</td>
<td>0.53%</td>
</tr>
<tr>
<td><strong>Sub-total</strong></td>
<td><strong>19,540.76</strong></td>
<td><strong>98.7%</strong></td>
</tr>
<tr>
<td>TOTAL</td>
<td><strong>19,802.34</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

6.7 Summary of which areas are potential HCS forest, subject to further analysis

- 17,926 ha of land (90.5% of the license area) has been developed for oil palm plantations by PT SSM. This includes infrastructure (plantation roads and drains).
- There are 261 ha of YRF and LDF (1.3% of the license area) that would likely be considered HCS forest and require further investigation.
- There are other areas of forest external to the concession that connect with forest inside the concession also.
7. Forest inventory results

7.1 Inventory sample design and plot rational

Within the concession it was actually very hard to find trees to measure at all. Any area that was initially mapped as forest in the north eastern portion of the concession was actually jungle rubber that was mixed in with natural forest, but it was almost impossible to map because you could start in jungle rubber, walk 50 m and you would be in a natural stand, then you could walk another 50 m and you would be back in jungle rubber. This makes it very difficult even to lay out a HCS plot without straying into another vegetation type.

In the eastern portion of the concession there was a small section of peat forest that had survived the 2015 fires. A number of plots were put into this area, but it was already showing the effects of wind damage and the effects of drainage near peat forests. In the western portion of the estate the team measured a couple of plots, but these were only in tiny pockets of pioneer forest or jungle rubber.

In summary, the assessors had to resort to putting plots wherever there were trees to measure, rather than focus on a statistically correct sampling strategy or getting any geographic spread. When the team got out to the field and realized what was mapped as forest was in most cases just scrub. The team therefore placed plots in places that were deemed to be sensible.
7.2 Map indicating plots

Figure 13. Plot locations on the revised land cover map.

7.3 Forest inventory team members and roles

<table>
<thead>
<tr>
<th>Team Member</th>
<th>Role</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jules Crawshaw</td>
<td>Plot Location, Measurement and Recording</td>
</tr>
<tr>
<td>Kursani Sumantri</td>
<td>Species Identification</td>
</tr>
</tbody>
</table>
7.4 Methodology used for forest sampling

HCS Plots

For measured plots, the plots are circular with an area of 500 m$^2$ (12.61 m radius) for trees with a dbh >15 cm. There is a sub plot inside the main plot with an area of 100 m$^2$ (5.64 m radius) for trees with a dbh of 5-15 cm. Figure 14 shows a schematic of the plot design that was used for the field measurement.

Figure 14. Plot Shape and trees measured (HCS Toolkit).
7.5 Methodology used for carbon calculations

Estimating the carbon density of each land cover class requires calculation of above ground biomass (AGB). Tree biomass is the parameter measured to calculate AGB.

Data Checking

Before analysis, the team double-checked data entry in the database with tally sheets to ensure accuracy. At this stage data was also analyzed for outlying measurements at:

- The individual tree levels
- The total AGB for the plot, e.g., looking at outliers when AGB was graphed against land cover category.

Step 1. Calculation of Above Ground Biomass (AGB)

AGB uses a tree level equation, individual tree biomasses are then summed to give an AGB / hectare. The equation used is described by Chave (2005). This AGB formula was used because the formula does not require tree height, furthermore it is commonly used component of carbon estimation in Kalimantan. The density is based on g/cm³, (oven dry mass/fresh volume). The data is based on data from Zanne (2009). This requires identifying all the trees to species level, this was not always possible. Sometimes they were only identified to genus level, in which case an average of the species of the genus (that were found in Indonesia) was used. In the absence of genus level density data; 0.55 g/cm³ was used⁵.

\[
AGB \text{ per tree (tonne/tree)} = dbh \times EXP(-1.499 + (2.148 \times LN(density)) + (0.207 \times (ln(density)^2)) - (0.0281 \times (ln(density)^3))
\]

NB: dbh must be in metres

Step 2. Calculation of Tree Carbon Content

In order to derive tree carbon content, a constant is used called the Biomass Correction Factor⁶ (0.47). This converts tree AGB to Tree Carbon Content.

Tree Carbon Content = Tree AGB x Biomass Correction Factor

Step 3. Calculation of Carbon per Hectare (Carbon Density)

Carbon per hectare requires summing the carbon content of each tree in the plot and then multiplying by plot size.

\[
\frac{\text{carbon}}{\text{ha}} = \sum (\text{TreeCarbon}) / [\text{Plot Size in ha}]
\]

⁵ 0.55 g/cm³ is an average density for tropical tree species proposed in the HCS Toolkit.

⁶ IPCC standard (2006)
7.6 Indicative photos of each vegetation class

Young Regenerating Forest

Table 8. Young Regenerating Forest was largely regrowth of *Artocarpus elasticus*
Low Density Forest

Table 9. The Low Density Forest was made up primarily of Cratoxylum glaucum and Litsea spp.
Jungle Rubber
Table 10. Jungle Rubber was made up primarily of rubber but other pioneer species such as Syzygium spp and Elaeocarpus spp.
7.7 Statistical analysis (allometric used, confidence tests, justification)

In normal circumstances the assessor would use an ANOVA test. This uses the mean (carbon density in this study) and the variance around the mean of each group (land cover categories in our study) to test whether the land cover categories have significantly different carbon stocks. In normal circumstances this is a good test of the quality of the land cover mapping. However, this is not really a normal circumstance because the land cover categories are highly heterogeneous. The difference between LDF and YRF was not based on carbon stock but rather species composition. LDF was made up of advanced secondary or primary forest species (*Shorea* spp and *Combretocarpus* spp), whereas YRF was made up of pioneer species (e.g. *Artocarpus* spp).

The assessor considers an ANOVA test to be inappropriate given a proper sample did not exist in this concession.
7.8 **Summary of statistical analysis of carbon stock results per vegetation class**

Table 11: Summary of statistical analysis of carbon stock results per vegetation class

<table>
<thead>
<tr>
<th>Land cover class</th>
<th>Number of Plots</th>
<th>Stems per hectare</th>
<th>Basal Area</th>
<th>Average Carbon Stocks</th>
<th>Standard error of the mean</th>
<th>Confidence limits (90%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>All species (tC/ha)</td>
<td>Rubber (tC/ha)</td>
<td>Natural forest species (tC/ha)</td>
</tr>
<tr>
<td>Low Density Forest</td>
<td>7</td>
<td>2200</td>
<td>67.46</td>
<td>73.7</td>
<td>73.7</td>
<td>N/A</td>
</tr>
<tr>
<td>Young Regenerating Forest</td>
<td>1</td>
<td>1940</td>
<td>67.38</td>
<td>72.7</td>
<td>72.7</td>
<td>N/A</td>
</tr>
<tr>
<td>Scrub</td>
<td>1</td>
<td>700</td>
<td>2.88</td>
<td>23.8</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Jungle Rubber</td>
<td>3</td>
<td>1013</td>
<td>75.42</td>
<td>91.1</td>
<td>47.7</td>
<td>43.4</td>
</tr>
</tbody>
</table>

7.9 **Forest inventory results**

Table 12: Forest inventory class

<table>
<thead>
<tr>
<th>Description</th>
<th>All species (tC/ha)</th>
<th>Rubber (tC/ha)</th>
<th>Natural forest species (tC/ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Density Forest</td>
<td>73.7</td>
<td>73.7</td>
<td>73.7</td>
</tr>
<tr>
<td>Young Regenerating Forest</td>
<td>72.7</td>
<td>72.7</td>
<td>72.7</td>
</tr>
<tr>
<td>Scrub</td>
<td>23.8</td>
<td>23.8</td>
<td>23.8</td>
</tr>
<tr>
<td>Jungle Rubber</td>
<td>91.1</td>
<td>47.7</td>
<td>43.4</td>
</tr>
<tr>
<td>Average</td>
<td>73.8</td>
<td></td>
<td>73.8</td>
</tr>
</tbody>
</table>

* During the survey a lot of plots were put into areas that were mapped as YRF or scrub but these were subsequently reclassified as Jungle rubber.
### Landcover Descriptions

**Open Swamp**
There are only very small areas of this sort of vegetation in PT SSM. However closer to the Seranau River this is a common land cover type. Hijau Daun was not able to gain access to these areas but they appear to be seasonally inundated from satellite photos.

![Swamp forest areas north of Sg Seranau](image)

**Figure 15.** Open swamp and swamp forest areas to the north of Sg Seranau.
Landcover Descriptions

Jungle rubber or Mixed Rubber
Most of the jungle rubber stands have been cleared and planted with rubber 15 – 20 years ago. Very few areas were being actively tapped. This is probably the result of low rubber prices in recent years. The natural forest species have recovered. These consist of pioneer species. Species that were commonly encountered are Vitex, Syzygium, Macaranga, Trema and species of ferns, rattan and other vines. These were mixed in with the rubber trees. If not further disturbed, secondary forest species would emerge e.g. Cratoxylum, Campnosperma, Litsea. These will eventually overtop the pioneer species (as well as the rubber) and out-compete them.

Figure 16. Jungle rubber. The rubber is a planted crop but there are many pioneer species that grow up alongside the rubber trees. e.g. Vitex, Syzygium, Macaranga and Trema.
Landcover Descriptions

Scrub (Ex burnt areas)
The area suffered considerable damage from fires in 2015. The areas that have been burnt are now a thick mat of scrub 2 – 3 m high. This scrub consists of *Irisan, Uncaria, Vitaceae, Zingiberaceae and Nephrolepidaceae*. Almost no trees of any stature remain the only exception being *Combretocarpus rotondatus* which is able to withstand fire better than other species probably because of its thick bark. Pioneer species such as Macaranga will eventually emerge but this will take about 8 years. In other places invasive trees that are very competitive such as acacia were seen growing.

Figure 17. After the fires only scrub which is approximately 2 m tall remains.
**Landcover Descriptions**

**Low Density Forest:** This forest type is only found in one small pocket in PT SSM. It is an area of peat swamp forest that survived the 2015 fires. It adjoins a larger area that stretches to the swamp areas near the Seranau River. In this context it is significant as a relatively intact area of forest. Only a small area was surveyed (which was inside the HGU), but a number of RTE species were noted. Many sun bear scratches were seen on the trees in this area as well as desk top research indicated orangutans are present in this area as well however based in the company monitoring records orangutans were never found in PT SSM.

Figure 18. A stand of peat swamp forest which had survived in the south east of PT SSM. There were a number of RTE species found here including *Shorea teysmanniana*, *Combretocarpus rotundatus* and *Gonystylus bancanus*. Additionally many *Nepenthes* were present in this area also.
Figure 19. The peat swamp area had many species of Nepenthes (Protected by GoI).
Landcover Descriptions

**Young Regenerating Forest**
This is an area that includes many of the riparian buffers as well as many pockets of forest throughout the concession. It is dominated by pioneer species. Typical species are *Artocarpus odoratissimus, A. elasticus, Elaeocarpus petiolatus* and *Cratoxylum glaucum*. Occasional sands of rubber were mixed in with these pioneer species.
8. Land Cover Classification

8.1 Refined land cover map

Figure 20. Final landcover classification map.
Figure 21. PT SSM – The results of the patch analysis. There are 158.58 ha of HCS within the HGU and an additional 746.48 ha external to the HGU (905.06 ha total). Taking into account HCV and peat to create a total conservation area of 778.92 ha inside the concession, 6618.1 ha outside and a total of 7397.01 ha.
## 9. Patch Analysis Result

### 9.1 Results of Decision Tree

<table>
<thead>
<tr>
<th>Patch number (GIS ID)(^8)</th>
<th>Total area (ha)</th>
<th>Of which core (ha)</th>
<th>Priority (Low-LP, Medium-MP, High-HP)</th>
<th>Description of Decision Tree results</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>17</td>
<td>8.09</td>
<td>&lt;10ha</td>
<td>LPP</td>
<td>Requires Pre-RBA (step 9). Requires RBA (step 10). Contains VU tree species</td>
<td>Conserve</td>
</tr>
<tr>
<td>18</td>
<td>8.76</td>
<td>&lt;10ha</td>
<td>LPP</td>
<td>Requires Pre-RBA (step 9). Requires RBA (step 10). Contains VU tree species</td>
<td>Conserve</td>
</tr>
<tr>
<td>5</td>
<td>11.37</td>
<td>&lt;10ha</td>
<td>LPP</td>
<td>Requires Pre-RBA (step 9). Contains permanently wet areas.</td>
<td>Conserve</td>
</tr>
<tr>
<td>1</td>
<td>13.56</td>
<td>&lt;10ha</td>
<td>LPP</td>
<td>Requires Pre-RBA (step 9). Contains river &gt; 2 m wide.</td>
<td>Conserve</td>
</tr>
<tr>
<td>6</td>
<td>15.01</td>
<td>&lt;10ha</td>
<td>LPP</td>
<td>Requires Pre-RBA (step 9). Requires RBA (step 10). Contains VU tree species</td>
<td>Conserve</td>
</tr>
<tr>
<td>10</td>
<td>15.84</td>
<td>&lt;10ha</td>
<td>LPP</td>
<td>Requires Pre-RBA (step 9). Requires RBA (step 10). Contains VU tree species</td>
<td>Conserve</td>
</tr>
<tr>
<td>0</td>
<td>17.35</td>
<td>&lt;10ha</td>
<td>LPP</td>
<td>Requires Pre-RBA (step 9). Requires RBA (step 10). Contains VU tree species</td>
<td>Conserve</td>
</tr>
<tr>
<td>4</td>
<td>17.70</td>
<td>&lt;10ha</td>
<td>LPP</td>
<td>Requires Pre-RBA (step 9). Contains permanently wet areas.</td>
<td>Conserve</td>
</tr>
<tr>
<td>14</td>
<td>20.34</td>
<td>&lt;10ha</td>
<td>LPP</td>
<td>Requires Pre-RBA (step 9). Requires RBA (step 10). Contains VU tree species</td>
<td>Conserve</td>
</tr>
<tr>
<td>2</td>
<td>20.73</td>
<td>&lt;10ha</td>
<td>LPP</td>
<td>Requires Pre-RBA (step 9). Contains river &gt; 2 m wide.</td>
<td>Conserve</td>
</tr>
<tr>
<td>8</td>
<td>21.27</td>
<td>&lt;10ha</td>
<td>LPP</td>
<td>Requires Pre-RBA (step 9). Requires RBA (step 10). Contains VU tree species</td>
<td>Conserve</td>
</tr>
<tr>
<td>13</td>
<td>31.56</td>
<td>10 - 100 ha</td>
<td>MPP</td>
<td>Requires Pre-RBA (step 9). Requires RBA (step 10). Contains VU tree species</td>
<td>Conserve</td>
</tr>
<tr>
<td>12</td>
<td>37.38</td>
<td>10 - 100 ha</td>
<td>MPP</td>
<td>Requires Pre-RBA (step 9). Contains river &gt; 2 m wide.</td>
<td>Conserve</td>
</tr>
<tr>
<td>11</td>
<td>39.40</td>
<td>10 - 100</td>
<td>MPP</td>
<td>Requires Pre-RBA (step 9). Requires RBA (step 10). Contains VU tree species</td>
<td>Conserve</td>
</tr>
</tbody>
</table>

\(^8\) Refer to the associated GIS Shapefile which has this unique key in it.
<table>
<thead>
<tr>
<th></th>
<th>ha</th>
<th>10). Contains VU tree species</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>40.80</td>
<td>Requires Pre-RBA (step 9). Contains river &gt; 2 m wide.</td>
</tr>
<tr>
<td>7</td>
<td>42.80</td>
<td>Requires Pre-RBA (step 9). Contains permanently wet areas.</td>
</tr>
<tr>
<td>16</td>
<td>68.92</td>
<td>Requires Pre-RBA (step 9). Contains permanently wet areas.</td>
</tr>
<tr>
<td>20</td>
<td>73.35</td>
<td>Requires Pre-RBA (step 9). Contains river &gt; 2 m wide.</td>
</tr>
<tr>
<td>9</td>
<td>105.12</td>
<td>Greater than 10 ha of LDF</td>
</tr>
<tr>
<td>19</td>
<td>124.80</td>
<td>Greater than 10 ha of LDF</td>
</tr>
<tr>
<td>3</td>
<td>170.94</td>
<td>Greater than 10 ha of LDF</td>
</tr>
</tbody>
</table>

### 9.2 Comments on Decision Tree outcome (including pre-RBA and RBA results)

The decision tree has resulted in most of the patches requiring a pre-RBA and RBA. This is an indication that most patches are small. The questions in the pre-RBAs focus on the following questions:

- Does the patch contain stream(s) of width greater than 2m?
- Does the patch contain swamp/permanently wet areas?

Where these patches did remain, it was primarily in swampy areas that were hard to access. The swampy areas, being permanently inundated, had enabled the forest areas to survive the fires. In general the remaining patches were in wet areas and therefore were conserved.

The next step was to look for threatened species. The dominant tree species in most of the patches that have been assessed above is *Combretocarpus rotondatus* (IUCN:VU). Being a threatened species, means these areas are set aside for conservation. This appears to have thick bark, which probably enabled this species to survive, whilst many of the other tropical species are killed by fire.
10. Indicative Land Use Plan

10.1 Summary of results of final ground verification

A draft Integrated Conservation and Land Use Plan (ICLUP) has been developed for the PT SSM area. The ICLUP consists of a map indicating areas for Conservation (no-go) Areas, Development (go) Areas, plus additional areas recommended to be used for non-plantation purposes. In addition to HCS results, data used to generate the ICLUP includes:

1. Results of HCV Assessment.
2. Peat land mapping.
3. Results of consultation of with communities including participatory mapping, discussions regarding food and water security, and consultation of the draft land use plan.

10.1.2 Food Security

The communities of Sebabi, Tanah Putih and Kenyala are made up primarily of subsistence farmers. There is a clear dependency of communities around PT SSM on garden produce. Long term food security needs to be considered when planning land conversion.

Actual land requirements will depend on the crops grown and yield per ha. As mentioned in the HCV report there are major problems here. The people need fire to clear land. Clearing land using fire is now illegal, the only alternative is heavy equipment, which is too expensive. Currently these villages are importing a lot of their food. It is a complicated situation!

The HCS toolkit identifies a figure of 0.5 ha per person as guidance on land requirement for food security.

To ensure that this requirement can be met; a participatory mapping exercise was undertaken. First, the communities of Sebabi, Tanah Putih and Kenyala agreed on the boundaries of the villages (mapped in Figure 22). These boundaries do not differ from those provided by the BPN. Secondly, the villagers confirmed that they had no activities within the HGU of PT SSM. Similarly, it was assumed that the villages had no activities within the HGUs of other oil palm companies located within these village boundaries. The remaining land (that was not with oil palm companies’ HGUs) was owned by the villagers. These are the areas that the community has “legal” access to. However, there were areas within this that were not suitable for cultivation (e.g. rivers and riparian areas) that needed to be excluded. The remaining area is available for cultivation. Two areas have been mapped in Figure 22; these are (1) areas that are currently cultivated by the community and (2) areas that are not currently cultivated by the community.

The large area of land in the class “Not Currently Cultivated (Community)” in all villages means that there is no shortage of land in the area. Based on community interviews the impediment to development of further lands is a prohibition on burning and the unaffordability of heavy equipment for land clearing.
Figure 22. The results of the participatory mapping.

Table 14 Explanation of participatory mapping categories from Figure 22. The results of the participatory mapping.

<table>
<thead>
<tr>
<th>Location</th>
<th>Label</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inside PT SSM</td>
<td>PT SSM Purchase (Non OP)</td>
<td>Areas in the process of payment of ganti rugi</td>
</tr>
<tr>
<td></td>
<td>PT SSM (Oil Palm)</td>
<td>Areas currently planted with oil palm</td>
</tr>
<tr>
<td></td>
<td>PT SSM (Non OP)</td>
<td>Areas that are not oil palm. They may include infrastructure, conservation or areas not cleared yet.</td>
</tr>
<tr>
<td>Outside PT SSM</td>
<td>Other Company (Non OP)</td>
<td>This is non-oil palm within other companies’ concessions</td>
</tr>
<tr>
<td></td>
<td>Other Company (OP)</td>
<td>This is oil palm within other companies’ concessions</td>
</tr>
<tr>
<td></td>
<td>Community (Cultivated)</td>
<td>This includes all areas where the community is currently cultivating. Common crops will be shifting agriculture, rubber and oil palm.</td>
</tr>
<tr>
<td></td>
<td>Community (Not Cultivated)</td>
<td>These are areas which the community owns that are not cropped. Current land cover is</td>
</tr>
<tr>
<td>Plan</td>
<td>Community Plan for cultivation</td>
<td>These are currently uncultivated areas that the community plans to develop for crops.</td>
</tr>
<tr>
<td>------------------------------</td>
<td>--------------------------------</td>
<td>---------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td>Community Plan for infrastructure</td>
<td>These are currently uncultivated areas that the community plans to develop for infrastructure.</td>
</tr>
<tr>
<td></td>
<td>Community Plan for road</td>
<td>These are currently uncultivated areas that the community plans to develop for roads.</td>
</tr>
</tbody>
</table>

10.2 Final HCS map

The final HCS map is built up of the following elements:

1. HCS areas as a result of patch analysis.
2. HCV areas
3. Areas of peat with natural vegetation still remaining (areas of peat planted with oil palm are not included).
4. Give and Take areas. (Some small isolated LPP (79.17 ha) from PT SSM are relocated (the “take” areas) to the south of PT GAP (the “give” area). The give area is added to PT GAP to form a more contiguous natural area – that hopefully in time will regenerate.

Figure 23. The final ICLUP which uses the "Give and Take" Mechanism to relocate isolated LPP to form a more contiguous area in the south. The area figures are provided in Table 15.
Figure 24. Explanation of the give and take. Isolated HCS patches will be relocated to PT GAP, a sister company of PT SSM, where they will form part of a more contiguous set aside and will connect with forest areas outside the concession. The swap will be based on a 1:1 land swap.
### Table 15. Areas (ha) of Conservation in PT SSM

<table>
<thead>
<tr>
<th></th>
<th>Inside the concession (ha)</th>
<th>Outside the concession (ha)</th>
<th>Total (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HCS based on Patch Analysis</td>
<td>158.58</td>
<td>746.48</td>
<td>905.06</td>
</tr>
<tr>
<td>Minus “take” Areas</td>
<td>-79.16</td>
<td>-79.16</td>
<td>-79.16</td>
</tr>
<tr>
<td>Add natural areas (that are not already HCS) which are classified as HCV or are on peat.</td>
<td>620.34</td>
<td>5871.61</td>
<td>6491.95</td>
</tr>
<tr>
<td>Total</td>
<td>699.75</td>
<td>6617.86</td>
<td>7317.61</td>
</tr>
</tbody>
</table>

#### 10.3 Overview of forest conservation management and monitoring activities to be included in the Conservation and Development (land use) Plan

As part of its HCV and HCS commitments, PT SSM needs to develop and implement a Conservation Area Management and Monitoring Plan. The plan should integrate both HCV and HCS areas/values. It is important to note that PT SSM, through its membership of POIG is required to take a whole of landscape approach to maintaining HCV and HCS values.

The main threat to this area is fire, which in el nino years has the potential to ravage natural areas and threaten both the livelihoods of the local communities but also the oil palm crop. Another lesser, but still important threat, is the lack of management of natural areas. This has resulted in the Seranau River being badly affected by mining.

### Table 16. Threat Assessment, Management and Monitoring Recommendations.

<table>
<thead>
<tr>
<th>HCV</th>
<th>Threat</th>
<th>Management Recommendation</th>
<th>Monitoring Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>• Further conversion of forest areas to agriculture</td>
<td>• Making an inventory of landcover in the wider landscape. From this, analysing areas that will (1) require restoration, (2) recover naturally and (3) are close to their natural state.</td>
<td>• Record incidence of fire and encroachment spatially along with dates that this occurred.</td>
</tr>
<tr>
<td></td>
<td>• Wildfires and deliberately lit fires.</td>
<td>• Highlight areas that are at high risk of burning to focus fire control measures.</td>
<td>• Establish permanent sample plots to monitor changes in forest condition.</td>
</tr>
<tr>
<td></td>
<td>• Conversion by the community of forest areas to agriculture.</td>
<td>• Paying of ganti rugi for HCV areas. (i.e. purchasing the land). So that the company has management control over these areas.</td>
<td>• Record all work that has been done with the police to close down illegal mining.</td>
</tr>
<tr>
<td></td>
<td>• Continued harvesting of trees particularly in riparian areas.</td>
<td>• Putting up signboards explaining the purpose of HCV</td>
<td>• Monitor the condition of the Seranau River (e.g. turbidity and satellite images) to determine the effectiveness of work.</td>
</tr>
<tr>
<td></td>
<td>• Agricultural chemicals entering the river system.</td>
<td></td>
<td>• Ongoing water monitoring.</td>
</tr>
<tr>
<td></td>
<td>• Gold and sand mining in the Seranau River.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
watercourses from mill operations.
• Pollution and sedimentation from mining in the Seranau River.⁹

areas. NB: this can only be done for areas within the concessions
• Establishing management committees with the community to set aside riparian areas from harvesting. Or setting up a rotational harvesting system to enable the forests to recover.
• Using hotspot indicators as well as fire towers to detect fires. Getting the community to assist with extinguishing fires.
• Continuation of the Fire Free Village (Desa Bebas Api) scheme.
• In the community owned area to the south-east of PT SSM form a collaborative management with the community to conserve this area.
• Planting of beneficial plants between the roads and ditches and between the palms and ditches to filter agricultural chemicals.
• Working with the police to close down illegal mining operations.
• Discouraging the community from drinking water from the river (because of levels of mercury from the gold mining).
• Provision of water filter systems to people that can’t afford better systems.

⁹ Mining by mining companies and traditional miners for zircon, bauxite and iron ore. This activity is diminishing due to the new Minerba regulation regarding the obligation to build refining facilities or a smelter. There is a possibility of the mining company preparing activities to be able to meet the regulation and will operate again in the future. The mining has greatly impacted on the decreasing quality of river water, sucking the sand and washing the material has caused turbidity of water and silting in the river.
<table>
<thead>
<tr>
<th>1</th>
<th>Threats to RTE mammal and bird species&lt;sup&gt;10&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• On-going eco-system decay as populations readjust following the impacts of the 2015 fires. This may cause local extinctions.</td>
</tr>
<tr>
<td></td>
<td>• Human – wildlife conflict.</td>
</tr>
<tr>
<td></td>
<td>• Trade in birds or other species (e.g. parts of the beruang madu are very valuable in Chinese medicine, pangolins are very sought after as food).</td>
</tr>
<tr>
<td></td>
<td>• Undertake an inventory of Orangutan population in the area to determine whether it is above or below the holding capacity. Noting the condition of the orangutans in the area.</td>
</tr>
<tr>
<td></td>
<td>• Working with the BKSDA to relocate Orangutans from areas that are not suitable for them, in order to minimise human – wildlife conflict. Alternatively implement programs as recommended by WWF and the BOSF MAWAS Foundation for the management of OU.</td>
</tr>
<tr>
<td></td>
<td>• Socialisation of regulations relating to hunting or killing of RTE species.</td>
</tr>
<tr>
<td></td>
<td>• The HCV area in the south of PT SSM , the forest in this area is owned by the community. It is likely this is where the orangutans are originating from. Developing a programme with the community to preserve this area.</td>
</tr>
<tr>
<td></td>
<td>• Repeating inventories of orangutan populations / condition to determine the success of habitat improvement.</td>
</tr>
<tr>
<td></td>
<td>• Continuing species monitoring based on the current procedure. Adding community interview element because many species were not picked up with the current procedure. Potentially the picture book approach for mammal identification that was used by Daemeter could be expanded to birds (i.e. making a picture book of birds that are potentially present to show the community). This would be worthwhile for staff training.</td>
</tr>
<tr>
<td></td>
<td>• Capturing time related information in the monitoring programme. This can be used to show which species are becoming more / less abundant.</td>
</tr>
<tr>
<td></td>
<td>• Recording incidence of hunting (i.e. whether hunters are seen or traps seen or even rumours about hunting).</td>
</tr>
<tr>
<td></td>
<td>• Monitoring the protection mechanism for preserving the forest area to the south of PT SSM.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>1</th>
<th>Threats to RTE vegetation species&lt;sup&gt;12&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Ongoing exploitation by the community.</td>
</tr>
<tr>
<td></td>
<td>• Fire</td>
</tr>
<tr>
<td></td>
<td>• Planting of threatened species (e.g. <em>Shorea balangeran</em>) in HCV areas.</td>
</tr>
<tr>
<td></td>
<td>• Keeping fire out of the HCV areas to enable the forest to</td>
</tr>
<tr>
<td></td>
<td>• Addition of permanent sample plots within the riparian areas to be able to monitor the growth (or otherwise) of the forests in the HCV areas.</td>
</tr>
</tbody>
</table>

<sup>10</sup> There are a lot of RTE mammal species and the threats are very similar. Therefore, these are dealt with as a group rather than individually.

<sup>11</sup> Note that with the current procedure orangutan presence was omitted. Given the importance of this flagship species, the current procedure needs to be reviewed. Also, some bird species were incorrectly identified.

<sup>12</sup> There are a lot of RTE mammal species and the threats are very similar. Therefore these are dealt with as a group rather than individually.
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<tbody>
<tr>
<td>2</td>
<td>• HCV 2 is absent in this assessment</td>
</tr>
<tr>
<td>3</td>
<td>• HCV 3 recommendations follow those of HCV 1 and are not repeated here.</td>
</tr>
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</table>
| 4 | • Burning to assist agricultural development within the riparian buffer strip or wildfires.  
   • Lack of awareness by company employees and contractors about HCV 4. Particularly building drains and roads through riparian areas  
   • Logging in the riparian areas.  
   • Construction of bunds to prevent the flood protection capacity.  
   • Agricultural chemicals entering the river system. |
|   | • Follow the buffers specified in this HCV report which are based on Indonesian law PP No 38/2011.  
   • Rivers / lakes /swamps areas and associated buffers marked on PT SSM operational maps.  
   • Planting appropriate species in the buffer areas. (e.g. Melaleuca and Shorea balangeran)  
   • Establishing community river management committees on allowable use of vegetation in riparian areas. This should be based on a similar rewards system as the Fire Free Village programme. In fact, it could even be incorporated into the structure of the Fire Free Village programme.  
   • Planting of beneficial plants between the roads and drains and also between the oil palm and drains.  
   • Continued implementation of the SOP which limits herbicide, pesticide and fertiliser application next to water bodies. |
|   | • Periodic monitoring of riparian buffer condition.  
   • Use of adaptive management to evaluate and adjust management and monitoring activities as necessary.  
   • Undertake water quality monitoring program to include HCV 4 areas identified during this assessment. Sample points should be where:  
   o rivers enter and exit the estate.  
   o drains flow into the rivers.  
   • Document all stabilisation works (e.g. planting of appropriate beneficial plant species) and monitor the effectiveness.  
   • Continued reinforcement with staff regarding the implementation of SOPs to ensure chemicals do not enter the waterways. |
| 5 | • Continued agricultural expansion putting  
   • Maintaining the right of the community to enter the  
   • Ensuring no one is using |

13 There are some rivers with insufficient buffer widths e.g. Sg Letem (Error! Reference source not found.). In these cases Daemeter recommends re-establishing riparian buffers with the new rotation and making a no spray no fertiliser exclusion zone within the riparian buffer. This is consistent with the company SOP that the area 0 - 20 m from the river requires the palms to be abandoned and natural forest species to be planted. 20 -50 m from the river is a chemical exclusion zone. Harvesting still takes place. With the second rotation the whole area will be restored with natural forest species.
<table>
<thead>
<tr>
<th><strong>increased pressure on</strong> natural areas.</th>
<th><strong>plantation and fish in the canal network.</strong></th>
<th><strong>explosive, poison or electro-fishing</strong> for catching fish.</th>
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<tbody>
<tr>
<td>• Continued conversion of swamp and areas to OP</td>
<td>• Formation of river management committees, which will focus on:</td>
<td>• Average fish catches in the rivers as a proxy for river health.</td>
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<tr>
<td>• Agricultural chemicals in the ground water.</td>
<td>o Controlled harvesting of riparian areas.</td>
<td>• Mapping burnt areas.</td>
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<td>• Over fishing</td>
<td>o Restoration planting in riparian areas</td>
<td>• Permanent sample plots in riparian areas.</td>
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<tr>
<td>• Use of poison or electro-fishing to catch fish.</td>
<td>o Setting aside fish spawning areas (ie. No fishing areas)</td>
<td>• Water quality monitoring</td>
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<tr>
<td>• Mining residues (e.g. mercury from gold mining).</td>
<td>o Fire prevention and control.</td>
<td></td>
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<tr>
<td>• Agricultural chemicals in the river causing eutrophication.</td>
<td>o Producing a code of ethics that states that fish can only be caught in a sustainable manner.</td>
<td></td>
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<tr>
<td>• Pollution of watercourses from mill operations.</td>
<td>• On-going pressure placed on miners to cease operations</td>
<td></td>
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<tr>
<td>• Inadvertent Clearing of these HCV 6 areas</td>
<td>• Ongoing filtration of water exiting the mill system.</td>
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<tr>
<td>• Marking of these areas on operational maps.</td>
<td>• Discouraging the community from drinking water from the river.</td>
<td></td>
</tr>
<tr>
<td>• Making sure the site is generally tidy and signage</td>
<td>• Provision of water filter systems to people that can’t afford better systems.</td>
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<td></td>
<td>• More participatory approach to management of HCV 5 in line with the recommendations made by the NGO Kemitraan. Using local cultural and customary approaches, by building awareness that these important values are essential to community sustainability.</td>
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</table>
- On-site signage. maintained.

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<td>maintained.</td>
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</table>
Figure 25. HCS requires consideration of corridors within a 5 km buffer of the concession. This map shows PT SSM (black). The combined conservation area of both concessions (SSM and MAS) is shown (hatched). Hansen (2015) data shows the forest / non-forest distinction. At best remaining forest in this landscape is very fragmented. The assessor has recommended focusing conservation efforts on the riparian areas within the vicinity of the concession.
10.4 List of activities still to be carried out before Conservation and Development Plan can be finalised

A participatory mapping exercise has been carried out which shows a number of conflicts with the HCV / HCS. These conflicts need to be resolved to generate a landscape-wide plan.

As a general observation PT SSM staff viewed their responsibility as the boundaries of the assessment area. They cited legal difficulties as soon as they stepped beyond the HGU boundaries, which were valid (areas external to the estate are mainly owned by the community). However, the HCV concept requires management across the landscape. Also, as a member of POIG, the company has made a commitment to landscape level management. A cultural change has to take place in the plantation to get the staff on side that they are managing an area of land with connections outside the HGU and have to develop strong partnerships with the surrounding communities.
References

(Downloaded 4th September, 2017)