RSPO New Planting Procedure

Assessment Summaries and Management Plans
Proposed new planting by PT Lestari Abadi Perkasa
in Ketapang Regency, West Kalimantan Province,
Indonesia 2019

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1. Overview and background

A new development is proposed by PT Lestari Abadi Perkasa (PT LAP). PT LAP is an oil palm company located in Tumbang Titi, Pemahan and Nanga Tayap Sub-districts, Ketapang District, West Kalimantan Province, Indonesia. PT LAP consists of 2 concessions, the first concession covers an area of ± 12,830 ha (refer to PT LAP 1) and the second cover an area of ± 1,140 ha (refer to PT LAP 2). The first concession has gone through NPP process and approved by RSPO in 2012 before commencement of land develpment. The proposed new development only covers the second concession and the "6 Kas Desa" (Village Oil Palm Development Project) located around the PT LAP concession. Throughout this report, both areas (PT LAP 2 and the 6 Kas Desa) will be referred as proposed development areas. The six planned Kas Desa are (a) Kas Desa Batu Mas, (b) Kas Desa Betenung, (c) Kas Desa Cegolak, (d) Kas Desa Sepuring Indah, (e) Kas Desa Pebihingan and (f) Kas Desa Kerta Baru. Where PT LAP is mentioned in this report, it refers to the second concession (i.e. PT LAP 2).

According to its geographical location, the proposed development areas are located in the equator. Therefore, these areas have wet climate conditions. Based on the type of land, the proposed development areas are mineral soil. Based on the results of the soil survey conducted by PT LAP it was known that there was no peatland, no sandy land and no acid sulphate soil at the proposed development areas in the concession of PT LAP 2 and 6 Kas Desa. Based on its hydrological conditions, the proposed development areas are located in two watersheds, namely the Pesaguan watershed and Pawan watershed. The location of the proposed development areas is not a biodiversity priority area. The proposed development areas are located far from the Hearth of Borneo area, Important Bird Area/Endemic Bird Area and Ramsar area.

The PT LAP 2 permit area and 6 Kas Desa also does not directly border protected areas and the surrounding conservation areas. Based on the Map of the System of Functions of Forest and Aquatic Region of the Province of West Kalimantan refers to the Decree of the Minister of Forestry No. 733/Menhut-II/2014, September 2, 2014, the closest protected area is in the form of Protected Forest about 3.4 km east and the closest conservation area is Gunung Palung National Park, about 46 km northwest. Based on the results of field data collection and analysis of all data, it was found that in the proposed development areas there were six categories of HCVs, namely HCV 1, HCV 2, HCV 3, HCV 4, HCV 5 and potential HCV 6.

The proposed development areas are areas with a long history of occupancy. LUCA study shows that there is no primary forest found in the concession of PT LAP. Almost all of areas are community cultivation land, mainly in the form of rubber mixed farms, mixed with fruit and tree crops, rice fields, horticultural farm, thickets, and fallow land. The majority of the communities in the villages around the proposed development areas own around 2 ha/household. The local communities' lands are usually located on the flat area near the villages. Beside rubber, "jengkol" and "durian" are other products produced by the community, which are harvested in certain seasons.

Rubber is the main source of income for the majority of the communities around the proposed development areas. In addition to buying and selling rubber produce for money generation, the community also conducts barter transactions by exchanging rubber latex with daily necessities. Farmers in this area also carry out other activities besides rubber cultivation. They carry out animal husbandary activities such as raising ducks, pigs, chickens or cows.

The majority of the communities around the proposed development areas are Dayaks, especially from the Dayak Kayong Sub-tribe, Gerunggang and Pesaguan tribe. In addition, there are also Malay and Javanese tribes, some of whom are transmigrants. The majority religion is Catholic, followed by Islam and Christianity, and a few other religions. The majority of the education of school-age children in the proposed development areas are at the elementary level and very few have reached tertiary institutions, so it can be concluded that the education level around the proposed development areas area are generally low.

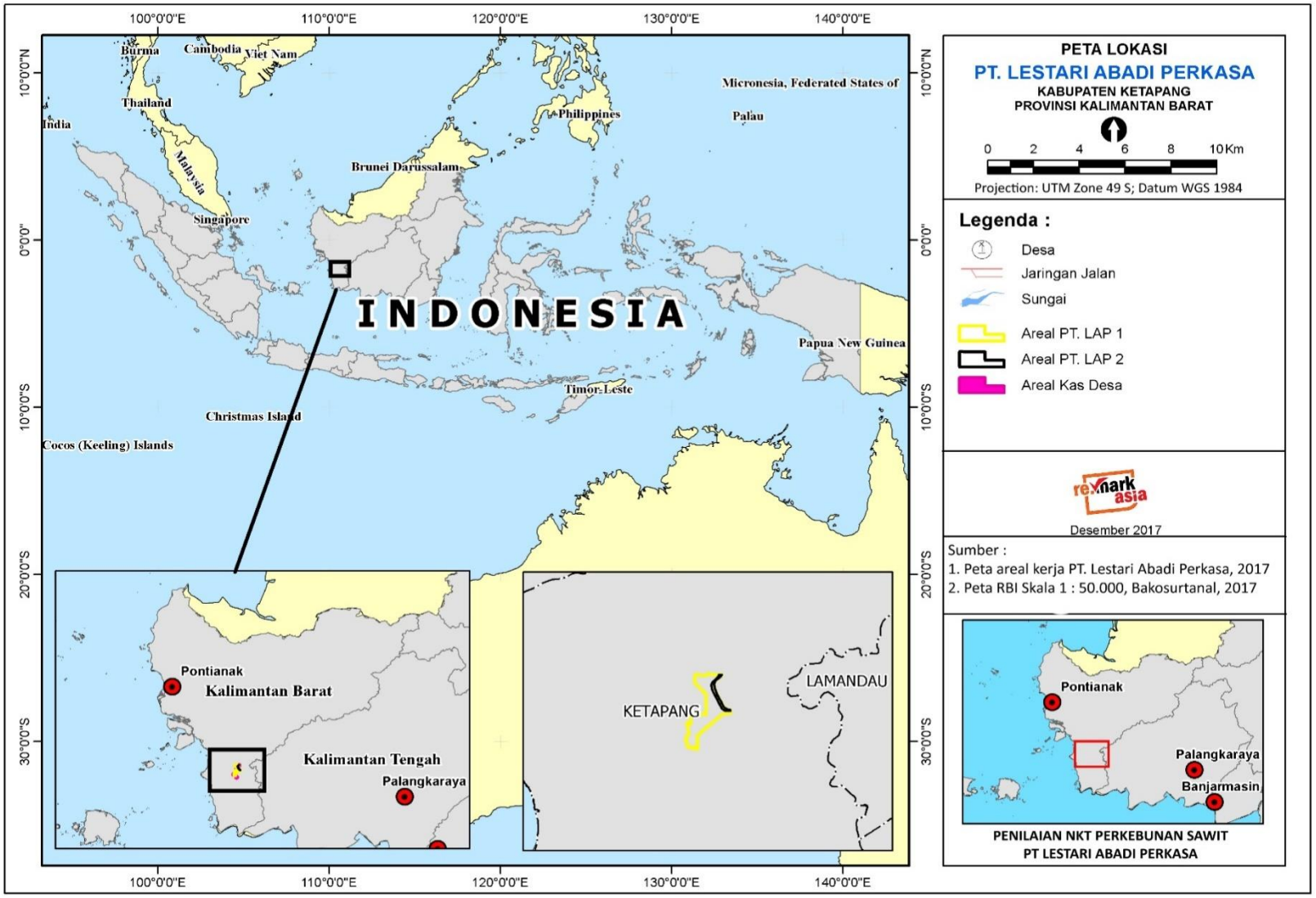

Figure 1. Map of PT LAP 1 and 2

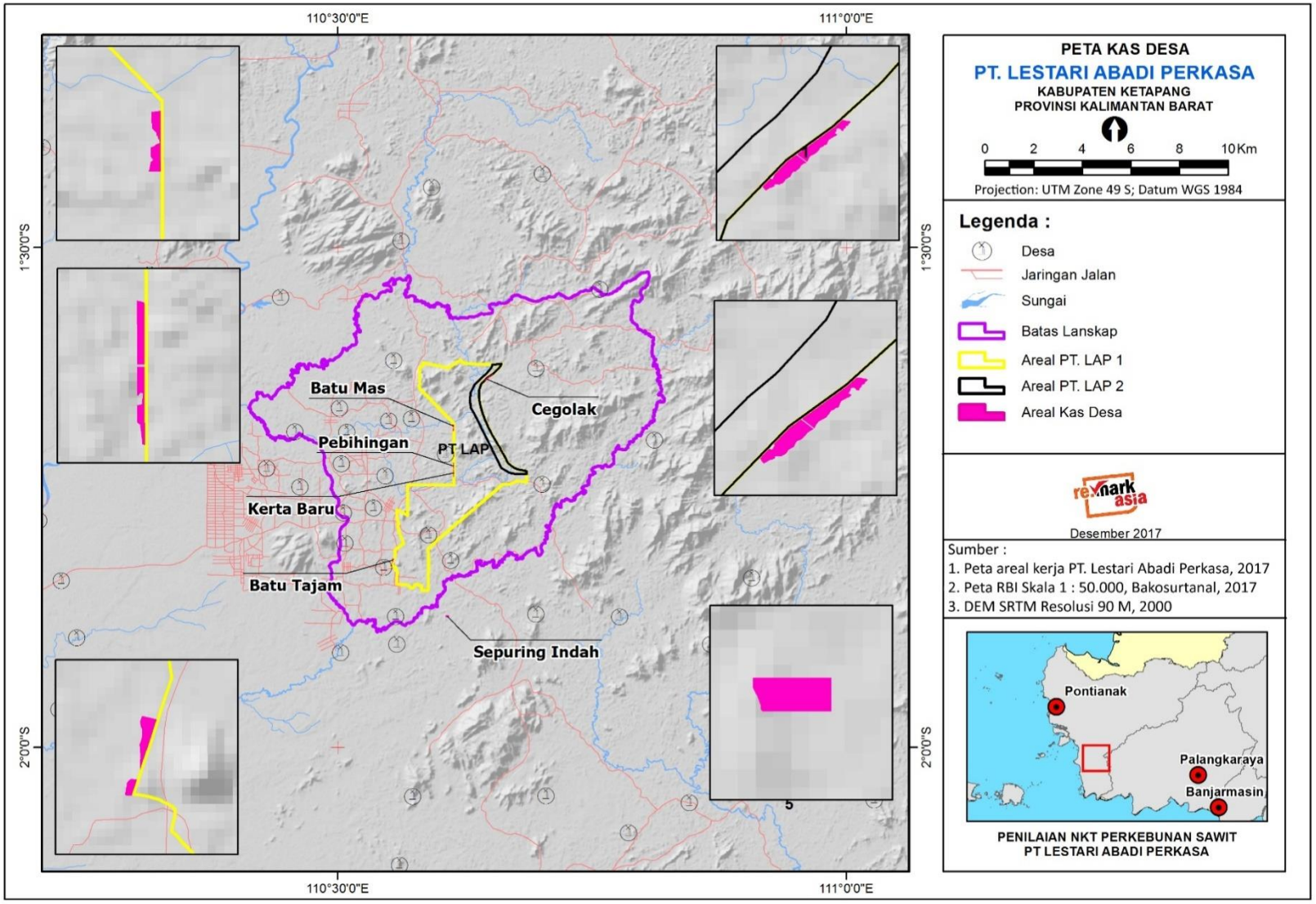

Figure 2. Map of PT LAP 1 and proposed development areas and its landscape areas

2. Assessment process and methods

2.1 Social and Environmental Impact Assessment (SEIA)

The development of the proposed development areas in Nanga Tayap and Tumbang Titi Sub-districts, Ketapang District would have an impact on the physical-chemical, biological, social, economic, cultural and local health environment, both positive and negative impacts. To examine the possible impacts of the development of proposed development areas, in November 2015 PT LAP conducted a Social and Environmental Impacts Assessment (SEIA), better known as AMDAL (UKL-UPL).

SEIA is a study to identify the large and important impacts of a business and / or planned activities on the environment and social aspect that are needed for the decision-making process regarding the operation of businesses and / or activities in Indonesia. This SEIA or UKL-UPL is carried out when the developer planning a project that is expected to have an influence on the surrounding environment, both negatively, and positively.

The scope of the social and environmental impact assessment is limited to four main factors / constraints, these are: physical-chemical, biological, social, economic, cultural and local health environment. The stages of the activities studied are divided into four main stages, namely: the pre-construction stage, the construction phase, the operation stage and the last is post-operation stage.

2.1.1 Assessment team and their qualification

The assessment of the social and environmental impact assessment was carried out by CV Bina Mitra Sejati which is located at Jl. P.H. Husin II Komp. Alex Griya I B-18, Bangka Belitung Barat, Pontianak Tenggara. CV Bina Mitra Sejati is one of the AMDAL consultants registered with the Ministry of Forestry (now called Ministry of Environment and Forestry).

CV Bina Mitra Sejati is a member of Perkindo (Persatuan Konsultan Indonesia / Association of Indonesian Consultants), specifically Perkindo of West Kalimantan. CV Bina Mitra Sejati is registered with Perkindo West Kalimantan with a membership number 0023 / KTA-KALBAR / V / 2006. CV Bina Mitra Sejati led by Mr. Zaelani who has been a member of Perkindo West Kalimantan since 2006. Perkindo was formed to realize the services of a professional, reliable and competitive National consultant in accordance with the requirements issued by the National Construction Services Development Institute / Lembaga Pengembangan Jasa Kontruksi Nasional (LPJKN). At present Perkindo of West Kalimantan Province stands firm with 35 administrators and with 138 companies as a member of Perkindo of West Kalimantan Province.

2.1.2 SEIA method

The preparation of SEIA (UKL-UPL) for this area was guided by the Regulation of the Minister of Environment Number 08 of 2006 concerning Guidelines for Preparation of AMDAL and refers to other relevant laws and regulations. As mentioned before, the scope of the AMDAL assessment is limited to four main factors / constraints, namely: project / activity boundaries, ecological boundaries, social boundaries and administrative boundaries. The stages of the activities studied are divided into four main stages, namely: the pre-construction stage, the construction phase, the operation stage and the post-operation stage. Important impacts that need to get attention are divided into two, namely negative impacts and positive impacts. Some important impacts that need to get attention on each of the main factors / limitations, including:

The important impacts that need to be addressed in the AMDAL assessment in the pre-construction phase of oil palm plantation development activities are the change in attitudes and perceptions of the community and the potential for social conflict. Potential conflicts will always arise when there is a change in society, one of which is the entry of companies into their territory. At this stage the activities to be studied are socialization and boundary arrangement and land acquisition that have been carried out by PT LAP.

The Important impacts that need to be addressed in the AMDAL assessment in the construction phase of oil palm plantation development activities are the reduction of air quality, increasing noise, decreasing the quality of surface water, increasing the rate of erosion, sedimentation in the river, decreasing of the diversity of flora and fauna, employment opportunities, business opportunities, increasing community income, changes attitudes and perceptions of the community, potential for social conflict, changes in patterns of community behavior, changes in environmental sanitation and patterns of disease and a decrease in public health.

The important impacts that need to be addressed in the AMDAL assessment in the operational phase of oil palm plantation development activities are the reduction in air quality, increased noise, the presence of employment opportunities, business opportunities, increased income of the community and changes in attitudes and perceptions of the community.

The important impact that needs to be addressed in the AMDAL assessment in the post operation phase of oil palm plantation development activities are in the form of decreasing air quality and increasing noise, decreasing people's income, changing attitudes and perceptions of the community and improving the quality of surface water. Management recommendations to minimize negative impacts and maximize positive impacts need to be formulated.

2.2 High Conservation Value (HCV) Assessment

The HCV assessment of the proposed development areas were carried out on February 26 to March 4, 2017. No land development activities are taking place in the proposed areas. Beside the proposed development areas, the assessment also covers the landscape around the PT LAP 1 and 2 concessions including Kas Desa Batu Mas, Kas Desa Betenung, Kas Desa Cegolak, Kas Desa Sepuring Indah, Kas Desa Pebihingan and Kas Desa Kerta Baru.

The HCV assessment report has taken the Quality Panel process at the HCVRN and has been published with a satisfactory status (https://hcvnetwork.org/reports/hcv-pt-lestari-abadi-perkasa-ketapang-district-west-kalimantan-indonesia/). Before the assessment, PT LAP management had conduct socialization with the surrounding communities to get their approval on HCV assessment implementation on March 16th-18th, 2016. As a part of FPIC process, PT Remark Asia assessment team, represented by Mr. Sigit Budhi Setyanto as a FPIC expert, visited the villages where sample points were taken prior to doing the HCV assessment.

2.2.1 Assessment team and their qualification

This assessment was carried out by an independent party that has competence in HCV assessment, namely PT Re-Mark Asia. The HCV assessment is led by the Assessor Licensing Scheme (ALS) under the name of Sigit Budi Setyanto with the registration number ALS15024BS and assisted by 9 other people who are experienced in environmental services, ecology / biodiversity especially for birds and mammals (6 people) and experienced in community empowerment, participatory mapping and FPIC expert (3 people).

Sigit Budhi Setyanto

Sigit Budhi Setyanto completed his Bachelor of Agriculture degree in Soil Science, Faculty of Agriculture, Jember State University and experienced in 'Tobacco Growers Communities Development' since 1990, one of which was for Philip Morris Inc. Marlboro cigarette manufacturer. Since 2004 he has been active as an auditor for the CAFÉ Practice Program in Indonesia and Papua New Guinea besides being an Agriculture Marketing Specialist for International NGOs for the Rural Agro-enterprise Development (RAeD) program. Get national and international training for Sustainable Organic, SCS-Starbucks CAFE Practice, Rainforest Alliance for Sustainable Agriculture, Forest Management and Chain of Custody and from DOEN for the Roundtable for Sustainable Palm Oil and International Sustainability and Carbon Certification (ISCC) from the Winrock International program. Until now, there have been several assessments, such as Study of the Social Economy of Palm Oil, Social Impact Assessment, Social & Environmental Impact Assessment and High Conservation Value Assessment for several oil palm companies in Indonesia, Malaysia and Papua New Guinea and plantation companies in Indonesia.

In 2010, Sigit was accredited by RSPO as Approved HCV Assessor - Discipline Specialist for Identification of HCV 5 and 6 in oil palm, HTI and HPH plantations and in 2015, Sigit obtained ALS Provisional License at HCVRN with registration number: ALS 15024BS.

Dera Syafrudin

Born in Cianjur in 1986, obtained a bachelor's degree (S1) from the Department of Forest Resources Conservation and Ecotourism, Faculty of Forestry, Bogor Agricultural University (IPB) in 2011. Dera is a lecturer assistant in the Management and Ecology of the Wildlife division, in the IPB's Faculty of Forestry since 2011 until now. In addition, Dera has been involved in HCV assessments in HPH, HTI, and plantations since 2011 until now. Dera has conducted HCV assessments since 2010, he also conducted studies in several regions in the provinces of Sumatra, Kalimantan, Sulawesi and Papua until now. He once attended the "HCV ALS Lead Assessor" training held by Remark Asia.

Rhama Budhiana

Born in Jakarta on December 20, 1986, obtained a bachelor's degree (S1) from the Department of Forest Resources Conservation and Ecotourism, Faculty of Forestry, Bogor Agricultural University (IPB) in 2010. Since 2008 Rhama has actively researched large mammals such as the Sumatran Tiger and the Sumatran Rhinoceros, and helped formulate books called Sumatran Rhino Survey Method together with WWF. With his experience, Rhama was trusted to become TFCA-Sumatera Program Manager in the AleRT-UNILA Consortium in 2013-2016 and joined Remark Asia since 2017 as a Biodiversity specialist. Rhama conducted HCV assessments since 2010, he also conducted studies in several areas in the provinces of Sumatra and Kalimantan until now. He once attended the "HCV ALS Lead Assessor" training held by Remark Asia.

Burhan Zein Khalilullah

Burhan was born in Surabaya 23 years ago, obtained a bachelor's degree (S1) from the Department of Forest Resources Conservation and Ecotourism, Faculty of Forestry IPB in 2017. During his studies, he was active in various student organizations at IPB. He has been involved in the Early Post-Eruption Vegetation Study in Mount Merapi National Park, Environmental Conservation Study in Manusela National Park and the "Tanah Seribu Pulau" Cave Expedition in Aketajawe Lolobata National Park. Currently, he is working independently in the HCS study, HCV at PT. Asian Remark.

Septiansayah

Septiansyah was born in Medan 24 years ago, obtained a bachelor's degree in Forestry (S1) in the Department of Forest Resources Conservation and Ecotourism, Faculty of Forestry, IPB in 2017. During his studies he involved in Biodiversity, Ecotourism and Conservation Photography research activities.

The experience of activities carried out by Septian includes surveyors at BPDAS Citarum-Ciliwung and FAHUTAN-IPB (2016), On Job Training in Ujung Kulon-Banten National Park (2015), RAFFLESIA Expedition (2014), Surili Expedition in Aketajawe Lolobata National Park (TNAL) - Maluku (2014). Currently, Septian works as a freelance at the consultant company PT Remark Asia as an HCS assessor.

Amirul Ikhsan

He was taking study in the field of Cartography and Remote Sensing of the Faculty of Geography at UGM. He has work experience for government organizations Environmental and Disaster Mitigation Clinics (KLMB) Faculty of Geography UGM as a GIS operator and surveyor in the field of Natural Disaster Mitigation, especially the area of Mount Merapi Yogyakarta in 2010 to 2011. He once worked at the PUSPIC UGM-Bakosurtanal institution as a GIS Trainer and Remote Sensing for PT SMART, teaching staff of Bangka Belitung State University and Bengkalis Regional Government from 2011 to 2012, as well as mapping and GIS consultants on forestry projects in 2011 and 2012.

Fadli

He is a Bachelor of Forestry from IPB in 2002. From 2004 until now he has worked as a Freelance in various consulting institutions. He work on various projects both survey projects in the forestry sector (IHMB, ITSP, Boundary Arrangement and ANVEG for AMDAL activities) and Palm Fertilizer Monitoring Team, Eo Dydra Committee, Social Enumerators, Asset Valuation, Quantitative and Qualitative Market Research, Company Companion for SFM in Various Consultants, HCV 5 and 6, Social Impact Assessment and High Carbon Stock at PT Studiotama Map, PT Sonokeling Akreditas Nasional and PT Ekologika Etc.

Herry Triyana

Graduated from the Faculty of Forestry, Department of Forest Management, IPB in 1995. From 1996 to the end of 2007 he worked at the United Nations, which was at UNDP for around 8 years and at FAO for around 3 years. In 2008 until now he joined PT Daemeter Consulting as a freelance for the HCV 5 & 6 and SIA fields. In addition to PT Daemeter Consulting, he also active in several consultants as freelance workers namely PT Remark Asia, PT Ideas Consulting, PT Wana Kestava, PT Kyara Solusi Indonesia and PT Pandu Maha Wana / Asia Pacific Consulting Solutions (APCS) that engaged in forestry as Social Sciences experts, Community Empowerment and CSR as well as surveyors for the field of forest potential inventory and have a certificate of Periodic Comprehensive Forest Inventory (IHMB).

Redy Miraz Muslim

He graduated from the Faculty of Forestry, Department of Forest Management, IPB, in 1995. From 1996 to the end of 2014 he worked at PT Glaxo Smith Kline for around 9 years and at Merck Sharp & Dohme for about 6 years, as a Key Account Executive.

In 2015 he joined the consultant PT Penta Sumberdaya Nusantara Consulting (freelance) for the HCVF 5 & 6 and SIA fields. Besides that, Redy is also active in the Swakelola Foundation of the Forestry and Plantation Service of Ciamis District as a Social Sciences expert, Community Empowerment and CSR as well as a surveyor for the field of forest potential inventory and has a certificate of Periodic Comprehensive Forest Inventory (IHMB). From May 2016 joined PT Kyara Solusi Indonesia Consulting (HCV 5 & 6 and SIA Consultants).

Dedi Dendi Wijaya

He graduated from the Faculty of Forestry, Department of Forest Product and Technology, IPB, in 2011. During his study he has involved in various project related to forest inventory. He joined the RSPO lead auditor training in 2014 and HCV assessment training in 2015. He also involved in several carbon stock assessment activities in Kalimantan in 2016 and 2017.

2.2.2 Timeframe

The whole series of HCV field assessment on PT LAP 2 new permit area and village farm outside the permit areas were undertaken from February to March 2017 (see Table below), containing these three major activities: (i) *pre-field*, (ii) field identification including stakeholder consultation, and (iii) post field work, data analysis and reporting.

Phase	Aim	Activity	Date
Pra-field			
Pre-assessment and preparation	• Identify potential and indication of HCV attributes in the assessment areas • Identify areas potentially indicating HCV • Attain deep understanding about the assessed landscape • Analyze recent conservation issues and its potential menaces towards HCV areas. • Determine method, survey plan, team member, and time frame.	• Collect preliminary data and information from the assessed company • Gather secondary data and information from existing reports, journals, books, statistics, basic maps and informants • Undertake data and spatial analysis	26-27 February 2017
Scoping Study	• Obtain data and information as well as the main issues directly from community representatives and the government • Verify information from the desk study. • Identify the main problems that must be covered during the assessment • Strengthen the schedule of visits and ensure that they can meet with	• Outreach the desired objectives and results of the HCV assessment plan. • Request internal staff to contact and schedule visits to villages.	26-27 Februari 2017

Phase	Aim	Activity	Date
	stakeholders and community representatives during visits to the village		
Field works			
Opening meeting & Basic Training on HCV	• Deliver aims and objectives of HCV assessment • Acquire additional data and information related to plantation establishment and management • Develop common understanding with the company about HCV background, aims and objectives, concept, HVC types, attributes and key elements, and identification method • Formulate a team work for HCV identification from the company side and timeframe decision	• Workshop with the company management unit • HCV training for the company management unit/staff	28 February 2017
Participatory mapping	• Clarify potential HCV areas resulted from preassessment activity • Collect additional data and information related to HCV elements and attributes	• Workshop with key informants	28 February - 4 March 2017
Field Survey	• Verify the existence of HCV attributes and elements • Identify HCV areas being present, map the indicative HCV boundaries • Identify threats and potential threats for HCV areas	• Land cover ground checking • Field data collection • Interview and triangulation	28 February - 4 March 2017
Stakeholder consultation I	• Inform associated stakeholders (local governments, local communities, and local NGOs) about the assessment results • Gather additional information and clarification about the presence of HCV attributes, elements and threats • Compile suggestions and recommendations, as well as options for HCV management and monitoring	• Meeting with key institutions • Focus Group Discussion (FGD) with related stakeholders • Interview with key informants	28 February - 4 March 2017
Closing meeting	• Inform the interim-results and report of HCV identification for company management unit	• Presentation and discussion • Submit interim-report	4 March 2017
Post-field works			
Analysis and reporting	• Submit final HCV report, presented in a systematic and scientific writing style, that	• Data analysis • Spatial analysis	March - May 2017

Phase	Aim	Activity	Date
	can be easily understood by users.	• Report writing	
Peer review	• Review process by other expeert to have a different perspective on multi-dicipline analysis.	• Reviewing and revising reporting	September – November 2017
Stakeholder consultation II	• Gathering input and recomendation related to HCV assessment result, and HCV monitoring and management plan from stakeholders	• Workshop with related stakeholders	December 2017
Final Report & Publik Summary Report	• Finalizing report andd public summary based on input and recomendation from peer reviewer and public consultation	• Reviewing and revising reporting	December 2017
Quality panel	• Proses pemeriksaan oleh Quality panel HCVRN	• Review oleh Quality panel HCVRN	Desember 2017 – November 2018
	• Proses revisi dan pemeriksaan ulang oleh Quality panel HCVRN	• Review revisi oleh Quality panel HCVRN	December 2018 – Mei 2019

2.2.3 HCV assessment method

2.2.3.1 Pre-assessment

In this stage the assessors carry out identification of data and information related to the assessment which includes: 1) Social and economic; 2) Biodiversity; 3) Environment; 4) Demography; 5) Regional Bio-physical and 6) Basic spatial data (Village, Road network etc.). Then based on the data and information collected, a desktop analysis is conducted to determine the potential of HCVs in the assessment area. The technical analysis in this report refers to the HCVRN Common Guidance for HCV Identification (Ellen Brown et al. 2013). The results will be used as a reference in Tier Rating and designing the field surveys.

2.2.3.1.1 Land cover change

Spatial analysis was carried out during the pre-assessment to obtain an overview of changes in land cover in the assessment area by comparing past and present land cover. Interpretations of the past and current land cover were conducted using Landsat imagery of the highest quality available. Interpretation is carried out using Landsat imagery with recording years of 2004, 2009, 2014 and 2016. The process of

interpretation is done by on-screen digitations, then it will be continued with further verification during field assessments. Interpretation is carried out on a landscape scale, but overall field verification is only carried out in the proposed development areas, while the areas outside the concession area will be done randomly using high resolution satellite imagery available in Google Earth. Hu et al. (2013) stated that Google Earth satellite imagery can be used with great care in the process of interpreting land cover.

2.2.3.2 Tier rating

Referring to the new HCV assessment scheme based on the ALS HCVRN, all licensed assessors (both provisional and full) are required to rank (Tier Rating) which considers various aspects such as the scale, intensity and risk of the project or development that requires an HCV assessment. Based on the results of the Desktop analysis, 'knowledge of the assessment area' and the risk assessment that has been determined by the HCV Resources Network is ranked Tier 1.

2.2.3.3 Scoping study

Preliminary studies begin with a desk review, document review and legality to determine the area of assessment. Document checking is also related to conditions (land cover, biodiversity, social, economic and conflict conditions) in the assessment area. Scoping was conducted through a meeting with PT LAP Management to ensure the exact location of the assessment location, a visit to the plantation site was not carried out because 'Team Leader' was a member of the PT LAP 1 HCV Study in 2011 and several team members had reviewed around the location of the PT LAP 2 assessment and the planned *Kas Desa* (Village Farm), so that it is sufficient to know the 'scope of PT LAP 2' basic plan for the Village Farm.

2.2.3.4 HCV assessment phase – field survey method

Field verification of HCVs based on Desktop Analysis at PT LAP 2 and its surroundings including Village Farm, several field surveys were carried out including: 1) Flora and fauna; 2) Hydrology and environmental services; 3) Social, economic and cultural accompanied by participatory mapping.

2.2.3.4.1 Flora and Fauna

Determination of location samples is done by stratified random sampling, while the number of observation points is determined based on expertise judgment by taking into account habitat representation based on the condition of the latest land cover on the site. The total number of visit points is based on habitat representation of 25 points. However, the availability of information and description of locations that tend to be the same at several observation points in the same habitat type, then the number of points that were visited were 17 points. At each location the sample identification of flora and fauna is carried out by opportunistic scan sampling by recording as much as possible the meeting of flora and fauna in the path that is passed by the observer.

Data collection on animal encounters is carried out either directly using the eye or binocular assistance, or indirectly which is usually in the form of sounds and traces left by animals. Then all animal encounters in the field will be validated with a number of references to animal identification manuals. Each group of flora and fauna will have varying degrees of difficulty in identification, so to assist in determining important areas for flora and fauna and wider ecosystems, species indicator approaches, key species or umbrella species will also be used. Specifically, for flora and fauna groups that have limited adaptive ability to change, as an example that has been widely used is using bird groups as a type indicator (BirdLife International 2013). To determine important habitat for fauna, a proxy approach is carried out by gathering information on three basic components (Fryxell et al. 2014), namely: cover, foods and water. The three basic components are assessed based on the best knowledge judgment supported by spatial information, field observations and scientific references.

Flora data collection is carried out by visiting predetermined sampling points or locations based on the previous analysis of land cover and by prioritizing areas that still have potential forest cover. Retrieval of flora species is carried out using the transect method, conducted in conjunction with High Carbon Stock (HCS) assessment activities.

2.2.3.4.2 Hydrology and environmental services

Identification of HCV 4 locations is done by analyzing the regional spatial area, landscape, topography and watershed location. After that is a field survey and interviews with respondents in selected locations, namely springs locations, rivers, river boundary conditions, land clearing locations and several locations that represent water management conditions within the plantation.

2.2.3.4.3 Social, economic and culture

The process of identifying HCV 5 and 6 is carried out with two main methodologies, namely participatory mapping and interviews. This process was strengthened through focus group discussions (FGD) with all participants. The targets of the respondents included sub-district heads, village heads, community leaders, traditional leader, a number of communities, NGOs and regional government (district level). Topics covered include information on the history of the region, sources of income for the community, biodiversity, utilization of natural resources, threats to biodiversity, sacred places and community interaction with PT LAP.

Kas Desa

The Kas Desa covered in the HCV assessment are Kas Desa Batu Mas, Kas Desa Betenung, Kas Desa Cegolak, Kas Desa Sepuring Indah, Kas Desa Pebihingan and Kas Desa Kerta Baru. The HCV identification process is carried out with the main methodology in the form of interviews, focus group discussions and

participatory mapping with village head respondents, village staff, BPD, community leaders, adat, a number of communities, land owners and local governments on the topic of land history, biodiversity information, land use cover, important or sacred places, cooperation plans for development and management of Kas Desa.

Participatory mapping

Participatory mapping is carried out in order to get information directly from company employees and the community by together conduct mapping activity on the areas that have the potential for HCV 5 and 6. The findings of data and information are directly matched with the initial findings from previous secondary data collection results when the desktop review. The aim is to obtain complete and accurate data and information related to the use of forest areas and natural ecosystems by the community.

In conducting assessments, the right data and information is needed to establish a region that has high conservation value based on social, economic and cultural use by the community. Indicators in conducting participatory mapping, including, 1) Level of interaction between distance and the relationship between a village and the area of the company; 2) Level of community dependence on resources in forest areas and other ecosystems; 3) Population livelihood; 4) Important social institutions; 5) Important social sub-groups.

The method in the process of identifying HCV 5 and 6 is also similar to the method used in HCV 1-3, namely stratified random sampling, or random and multilevel sampling determination taking into account the indicators mentioned above. This process continues to the stages of observation and interview using purposive sampling method, namely by setting the target respondents and an area obtained from the results of participatory mapping to obtain accurate and complete information.

Interview and observation in the field

A purposive sampling method was used in determining the target respondents who had been obtained from the participatory mapping process. Target respondents were interviewed in depth to get complete and accurate information regarding the use of the area socially, economically and culturally by the community. Determination of target respondents continues to grow along with the existence of new findings based on information obtained from previous interviews (snowballing), so that the data and information obtained can be more complete and accurate. The use of methods is combined with sampling methods based on encounters with the community when making observations in the field by considering previous indicators, such as conducting interviews with communities who are conducting livelihood activities or related to the utilization of other natural areas / ecosystems.

Determination of targets is carried out on areas that are considered to have the potential of HCV 5 and 6 using purposive sampling method to be observed on the physical condition of the area. Determination of the target of this region also continues to grow (snowballing) along with the development of data and information obtained during in-depth interviews with target respondents or spotted encounters with the community. By this approach the comprehensive and accurate data and information can be obtained related to the use of an area by the local community socially, economically and culturally.

Focus Group Discussion (FGD)

FGD was performed to get comprehensive data and to see the interactions among the community. The FGD method is combined with observations and in-depth interviews to produce quick discussions that are relatively open with a group of people (Morgan, 1996; 24). The FGD aims to gather information and opinions from the participants, clarify, confirm, complement and deepen the findings related to HCV.

2.2.3.5 Potential threat

Identifying and measuring threats to HCVs is conceptually carried out by studying sequential causes due to threats, spatially to look at the location of potential threats that have occurred as well as potential threats in the future (Sanderson et al. 2002). Sources of threats to HCVs are available scientific references to determine parameters and borders against threats. Furthermore, past and ongoing threat sources were identified by the parties during field surveys, discussions with companies and during public consultations.

2.2.3.6 The main reference collected

The main sources of information compiled and analyzed in the pre-assessment relate to: species, habitats, conservation areas and ecosystems (HCV 1-3), Watersheds, slopes and land physiography (HCV 4), Statistical data (demographics and others), livelihoods and village distribution (HCV 5), as well as ethnic and religious composition (HCV 6).

Table 1. Main reference used

HCV	Main reference
1	• "The boundary map of the PT Lestari Abadi Perkasa area (source: Appendix IUP and Decree of the Regent of Ketapang, granting additional location permits for PT Lestari Abadi Perkasa) • Citra Landsat 8 (USGS, Mei 2016) • IUCN Red List of Threatened Spesies. *www.iucnredlist.org* • Endemic Bird Areal Factsheet: Borneo (BirdLife International, 2012) • Important Bird Areals in Asia: Key Sites for Conservation (Birdlife International, 2004) • Appendices I, II and III, valid from 14 April 2014 (CITES, 2014)

HCV	Main reference
	• "Map of the distribution of Bornean orangutans" (Banes *et.al.*, 2016; Singleton *et.al.*, 2004) • PT LAP NPP process, HCV Assessment Report dan Social Impact Assessment Report, 2011
2	• The boundary map of the PT Lestari Abadi Perkasa area (source: Appendix IUP and Decree of the Regent of Ketapang, granting additional location permits for PT Lestari Abadi Perkasa)"Map of Conservation Area and protected forest of West Kalimantan Province (Dishut Kaltim, 2015). • Peta The Heart of Borneo, sumber: *http://www.hob.org* • Areal Ramsar di Indonesia, sumber: *http://www.ramsar.org* • Citra Landsat 8 (USGS, Mei 2016) • PT LAP NPP process, HCV Assessment Report dan Social Impact Assessment Report, 2011 • Intact Forest Landscape 2013 sumber http://www.intactforests.org/data.ifl.html
3	• The boundary map of the PT Lestari Abadi Perkasa area (source: Appendix IUP and Decree of the Regent of Ketapang, granting additional location permits for PT Lestari Abadi Perkasa)Peta Indikatif Penundaan Pemberian Izin Baru (PPIB) revisi IX (2015) • Citra Landsat 8 (USGS, Mei 2016) • The Ecology of Kalimantan. Periplus Edition, HK. (MacKinnon, *et.al.*, 2006) • "Identification of the Kalimantan Island Ecosystem (Prihatna/WWF Indonesia, 2009) • PT LAP NPP process, HCV Assessment Report dan Social Impact Assessment Report, 2011
4	• The boundary map of the PT Lestari Abadi Perkasa area (source: Appendix IUP and Decree of the Regent of Ketapang, granting additional location permits for PT Lestari Abadi Perkasa) Data *Digital Elevation Model* 30 meter, Shuttle Radar Topography Mission (USGS, 2004) • "Map of land scale system 1:250.000 (RePPProt, 1989) • Peta ketinggian tempat (hasil pengolahan berdasarkan data DEM-SRTM1) • "Map of the boundary of the Watershed – DAS (hasil pengolahan data SRTM) • "Slope class map (hasil pengolahan berdasarkan data DEM SRTM) • "Map of land cover (hasil pengolahan berdasarkan citra Landsat 8 dan Sentinel-2, 2016) • PT LAP NPP process, HCV Assessment Report dan Social Impact Assessment Report, 2011
5	• The boundary map of the PT Lestari Abadi Perkasa area (source: Appendix IUP and Decree of the Regent of Ketapang, granting additional location permits for PT Lestari Abadi Perkasa)Kabupaten Ketapang Dalam Angka 2015 (BPS Kabupaten Ketapang, 2016) • "Nanga Tayap Subdistrict in Figures, 2015 (BPS Kabupaten Ketapang, 2016) • "Tumbang Titi Subdistrict in Figures, 2015 (BPS Kabupaten Ketapang, 2016) • Distribution map in Kecamatan Nanga Tayap dan Tumbang Titi, Kabupaten Ketapang (Sumber: BIG) • Lancover map (hasil pengolahan berdasarkan citra Landsat 8 dan Sentinel-2, 2016) • PT LAP NPP process, HCV Assessment Report dan Social Impact Assessment Report, 2011
6	• The boundary map of the PT Lestari Abadi Perkasa area (source: Appendix IUP and Decree of the Regent of Ketapang, granting additional location permits for PT Lestari Abadi Perkasa) Kecamatan Nanga Tayap Dalam Angka 2015 (BPS Kabupaten Ketapang, 2016)

HCV	Main reference
	• "Nanga Tayap Subdistrict in Figures, 2015 (BPS Kabupaten Ketapang, 2016) • "Tumbang Titi Subdistrict in Figures, 2015 (BPS Kabupaten Ketapang, 2016) • "Ethnic distribution map in West Kalimantan (sumber: Peta SIL Internasional tahun 2015 dalam http://www.ethnologue.com) • PT LAP NPP process, HCV Assessment Report dan Social Impact Assessment Report, 2011

2.3 Soil survey

The proposed development areas soil survey activity was carried out in two ways and carried out by two different teams. The first survey method was using the secondary data related to the distribution of soil types in Ketapang Regency. This was carried out in conjunction with the HCV assessment in February 2017. The second method of survey is to take soil samples in the field. This soil survey activity was carried out by PT LAP's internal R&D team on January 8-17, 2016 for PT LAP and in 17th October 2017 for its Kas Desa. Based on the two types of assessments, a map of the distribution of land types in the proposed development areas concession was obtained.

2.3.1 Assessment team and their qualification

The soil survey using secondary data at the proposed development areas were carried out by the consultant team of Re-Mark Asia (lead by Sigit Budhi Setyanto), while the soil survey by taking soil samples in the field was carried out by PT LAP's internal assessment team that consist of research and development team (R & D), PT LAP's survey and public relations team. The R & D team plays a role in the collection and analysis of the soil types, the survey team plays a role in navigating to the sampling point, while the public relations team plays a role in communicating with the surrounding community, especially if the sampling points are located on community land.

2.3.2 Soil survey method

The method used for soil survey using secondary data is done by overlaying secondary data that has been collected with the vector of the proposed development areas concession boundary. Example of secondary data used is a map of the land system that is derived from the macro scale map of RePPProt land system 1987 and the map of soil types and land units in 2011. In addition to land system data, soil type data was also collected. USDA Soil Taxonomy in 1984 is used to determine the soil type. The method used for field soil survey is a grid method with a size of 200 x 300 m (1 : 6 Ha). The planned sampling points are placed on each sub-block to ensure representation of each sampling points meets the required sampling intensity.

Observation of soil types is carried out by drilling at each planned sampling point and the description of the physical properties of soil in the field is carried out, which includes several criteria, including: soil color, texture, consistency, drainage, slope, effective depth and other physical properties found in the field. Soil survey activities are carried out by referring to the soil type guidebook for Indonesia. References used in the assessment of soil types of the proposed development areas are Keys to Soil Taxonomy, USDA, Eleventh Edition, 2010 and Guidelines & Keys to Proposed Indonesian Soil Series - First Edition, 2010.

2.4 High Carbon Stock (HCS) Assessment

In addition to HCV, at the same time PT LAP has also conducted the High Carbon Stock Assessment (HCSA). The HCS assessment of the proposed development areas were carried out on February 26th to March 4th, 2017. PT LAP's carbon stock assessment activities covered both PT LAP location permits, including Kas Desa plantations and the other surrounding areas in the wider landscape. The Kas Desa are (a) Batu Mas Village, (b) Betenung Village and (c) Cegolak Village which is included in Nanga Tayap District and (d) Pebihingan Village and (e) Kerta Baru Village which included in the Pemahan District. HCS assessment is carried out by referring to HCSA toolkit version 2, 2015. HCS PT LAP assessment has gone through the HCSA Quality Review process and the results of the quality review process have been published on the HCSA (http://highcarbonstock.org/wp-content/uploads/2018/04/HCSASS1.pdf).

Kas Desa Sepuring Indah which is located adjacent to PT Mentari Pratama (PT MP, which also belongs to Musim Mas Group and is under the management of PT LAP) has also gone through HCS assessment together with PT MP which has been peer reviewed by HCSA on July 2018 (http://highcarbonstock.org/wp-content/uploads/2018/07/HCS-Assessment-Summary-Report-Musim-Mas-PT.-MP.pdf). PT MP is located below PT LAP. All three concessions (PT LAP 1, 2 and PT MP) are aligned in a contiguous block.

2.4.1 Assessment team and their qualification

This assessment is carried out by an independent party that has competence in HCS assessment, namely PT Re-Mark Asia. The HCS assessment was led by Mr. Cecep Saefulloh and Adiwijoyo (both are Registered Practitioners) with the assistance of 4 other people who played roles in remote sensing, biodiversity, forest inventory and carbon analysis.

Cecep Saepuloh

He obtained a Bachelor of Forestry degree from the Faculty of Forestry, Bogor Agricultural University in 1995. He began his career in the Forestry Consulting Company of PT Pro Natres Development as a junior consultant to run several projects related to feasibility studies, AMDAL and field surveys in the Forestry Sector from 1995 to 1996. Then he joined the production forest management company (HPH / IUPHHK) and the integrated wood industry of PT Kiani Lestari (Kalimanis Group) during 1996-2001. In 2000 he

joined TUV Rheinland Indonesia. Started as a Project engineer (auditor) in 2001, in 2009, he was promoted to a higher level as Deputy General Manager for natural resource certification (Forestry and Agriculture). Currently he has the qualifications and competencies as Lead auditor for EMS (environmental management system) ISO 14001, Lead auditor for ISO 9001 quality management system, OHSAS 18001 auditor (Occupational Health and Safety), Auditor for Forest Management Certification and Chain of Custody for FSC, PEFC, LEI and Mandatory Standards for the Indonesian Government scheme: SFM and VLK (timber legality verification), auditors for RSPO, ISCC and ISCC. Finally, he got the qualification as HCV team leader and specialist from RSPO. After 11 years with TUV Rheinland Indonesia, he decided to establish and develop a new company PT Re-Mark Asia and he is one of its founders.

Adi Wijoyo

Adi has more than three years of experience in the field of GIS and Remote Sensing. Started experience as an assistant trainer and trainer in GIS training at UGM PUSPICS. He involved in the disaster mitigation of Mount Merapi in 2010 at the Environmental and Disaster Mitigation Clinic - Faculty of Geography UGM. He then joined Re-mark Asia as an associate since 2013. His role in Re-Mark Asia is mainly as a GIS Specialist. He is experienced in the fields of land use / land cover mapping, High Conservation Value (HCV) assessment, High Carbon Stock (HCS) assessment and Participatory Mapping.

Tiara E. Ardi

Tiara has more than 3 years experience in biodiversity surveys and spatial mapping. Since at the college, Tiara has involved in the various expeditions and studies, especially in the field of ethnobotany. One of the studies conducted with Lawalata IPB in 2011, which located at the West Kalimantan Kanayatn Dayak Tribe was published in the International Conference of Indonesian Forestry Researcher, where the results of this study were also included in a book entitled "Apotek Alam Bumi Dayak Kanayatn " published by Seameo Biotrop in 2014. In 2012, Tiara and friends also contributed to the ethnobotany inventory in Wasur National Park (Merauke) to help document ethnobotany potential by the TNW office. At present Tiara is still active in the field of biodiversity suvey and also spatial mapping, as well as active was involved as administrator of one of the speleology organizations in Indonesia.

Armin Agung Mubarok

Agung has more than 3 years' experience in the field of biodiversity survey. Since in the college, Agung has involved in various expeditions and scientific studies especially in the field of forestry. One study was conducted with members of HIMAKOVA IPB in Manusela National Park (2013) and Akatajawe Lolobata National Park (2014).

Dian Pratiwi

Dian has participated in the Land Cover Change Analysis project at the Indonesian Peatland Network Project with CIFOR 2014 in Rawa Aopa Watumohai National Park, Southeast Sulawesi Province. Another project that has been followed is the mapping of mangrove surveys with the Ministry of Maritime Affairs and Fisheries in Tangerang. In addition, she worked at PT Rimba Makmur Utama (Katingan Project) in peat restoration activities in Central Kalimantan from November 2015 - February 2017. Since 2014, Dian has been worked in the field of GIS, Remote sensing and biodiversity. Currently she works as a freelance in the HCS, HCV, CSA, and LUCCA activities.

2.4.2 High carbon stock assessment method

The area of interest reviewed in this assessmend is determinded based on the location permits of the PT LAP 1, PT LAP 2, PT MP (all three concessions are adjacent to each other aligned in a contiguous block) and including areas located approximately 1 km from the outside of boundary of these concessions (which has also cover all the planned Kas Desa development areas). These limits were examined primarily in determining the existence of forested areas outside the location permit which were most likely to be connected to forest patches inside the proposed development areas. To produce data regarding forest with high carbon stocks, land cover data and carbon measurements from forest inventory plots are used.

2.4.2.1 FPIC Process before field assessment

The HCS Assessment of the proposed development areas were done by putting forward the community participation and the implementation of FPIC concept. Before HCS assessment was done, PT LAP management had conduct HCS socialization to the surrounding village community and to get approval from local community on HCS assessment implementation on March 16th-18th, 2016. Meeting result shows that the community understands and comprehends well regarding the village participatory mapping, HCV and HCS. Additionally, the community approved as well to create a participatory mapping team and to support a participatory mapping work plan as well as the HCS assessment activity.

As a part of FPIC process, PT Remark Asia assessment team, represented by Mr. Sigit Budhi Setyanto as a FPIC expert, visited the villages where sample points were taken prior to doing the HCV and HCS assessment. The activity aims to give initial information to the community regarding HCS assessment activity details as well as to get approval on HCS assessment activity in each village. The process was done to minimalize the possibility of misunderstanding arisen while doing HCS assessment. The community involvement and participation is an important point in the HCS assessment activity since the areas indicated as HCS areas will be managed and monitored together with the local community in the future.

In a broader process of FPIC related to land acquisition, PT LAP has been involving the community since its initial activity in oil palm development plan. This is necessary to assure that the local community understands the purpose and the positive and negative impact prior to giving approval on the land acquisition which will be done. The FPIC process by PT LAP was done based on the Free Prior and Informed Consent (FPIC) requirements. Through the process, the entire FPIC steps had been fulfilled at PT LAP. The relation of FPIC process in land acquisition and FPIC in HCS assessment is a clean clear in information and land status related to the future areas that will be used as HCS areas.

2.4.2.2 Description of images used in the assessment

The main image used in this assessment is Landsat Satellite Image 8 OLI-TIERS path 120 / row 61, with a spatial resolution of 30 meters, and has a spectral resolution of 7 multispectral channels and 1 panchromatic channel. Image selection is based on the best atmospheric conditions with cloud cover that are less than 20%. The acquisition date of image used is August 3rd 2016.

The quality of this Landsat Satellite Image in the proposed development areas is clouded by 2.5% of the total area while the area affected by thin clouds (haze) is 6.8% of the total area of the proposed development areas. To still be able to identify the areas covered by clouds and haze in Landsat imagery on 3rd August 2016, Sentinel-2 Satellite Image was used with the acquisition date of April 7th 2016. This Sentinel-2 Satellite Image is used to correct the area covered with clouds and thin clouds in the Landsat Satellite Image. In extracting land cover information to assist in interpreting the image as well as recognizing objects, radiometric correction is carried out on the Landsat Sattelite Images 8. Radiometric correction is done by changing the value of the digital number (DN) to reflectance. So that it can help to distinguish one object with another.

2.4.2.3 Methods for stratification and software used

Classification of land cover was carried out by hybrid interpretation, based on the supervised classification then corrected using manual interpretation. The software used in conducting land cover classifications and supervised classifications using the maximum likelihood method is ArcGIS 10.4. Visual interpretation is used to correct the image from the results of field activities.

2.4.2.3.1 Accuracy test

Accuracy testing is needed to get a quantitative assessment from the result of the classification process using the supervised maximum likelihood. Sampling points taken were 333 points that distributed in six landcover classes. Determination of the accuracy test sample is calculated using the systematic grid approach that produces a population number (N) then, to get the sample point (n) the number of population (N) multiplied by sampling intensity of 1%.

2.4.2.4 Field sampling designs and plots used

The next step is to determine the field design of sample plots based on the results of stratification of land cover obtained through satellite imagery. The team then determined areas that had a variety of stratification to carry out transects sampling. The length of transects used on this activity is 800 meters with a distance between plots is 100 meters, so that on one transect there are 8 sampling plots. The points then uploaded to GPS to guide the team on the field.

The sampling plot design used in tree data collection (D> 15 cm) is a square plot (large size plot) with the length of 50 m and width of 10 m. In the tree sample plot there are sample plots (small size plots) to collect poles data (D ≤ 15 cm). The size of this plot is 10 m in length and 10 m in width, determined from the center of the tree plot (10 mx 50 m). The center of the plot is placed at the beginning of transect. Determination of the transect plot was carried out by the stratified random sampling method. The numbers of plots in one transect averaged to 5-6 plots.

2.4.2.5 Methodology used for sampling in the field (forest)

Vegetation measurements are only carried out on large plant, including sapling, poles and trees that have a diameter at the breast high (DBH) of more than or equal to 5 cm. Sevral things that need to be considered in measuring vegetation in the sample plots are:

a. The trees that will be measured must have a stem center (at DBH) located within the plot boundary.

b. Trees that have been measured are then recorded in a tally sheet and marked with flagging tape.

c. The measured vegetation has a diameter of more than or equal to 15 cm measured in large plots. Vegetations that have a DBH of more than or equal to 5 cm and less than 15 cm are measured in small plots.

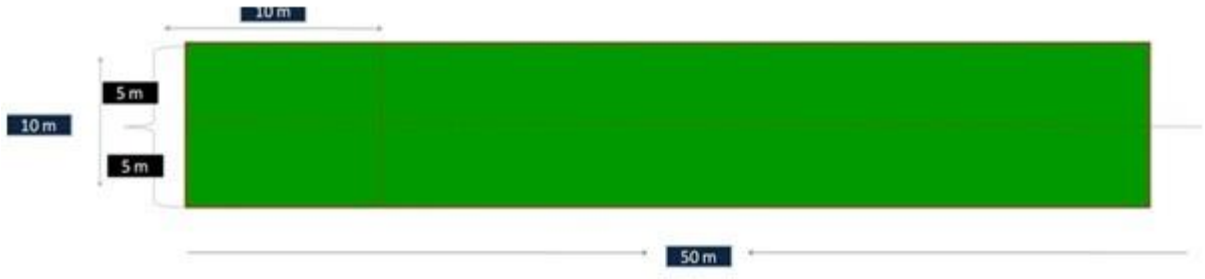

Figure 3. Ilustration of Sampling plot

2.4.2.6 The methodology used for carbon calculation

The methodology used in carbon calculation is a non destructive sampling method. In practice, carbon measurements are carried out by measuring tree diameter. The diameter in question is diameter at breast high (DBH). The measured DBH value is then entered into the allometric equation that was previously obtained at the desk study review before the assessment was carried out in the field. The allometric equation used is an allometric equation for estimating biomass. Furthermore, the value of biomass obtained is converted to carbon mass value or carbon deposits contained in vegetation.

After knowing the biomass value, then the carbon stock value is calculated based on the equation issued by the IPCC, as follows:

$$\boldsymbol{C\ (ton\ C) = 0,47x\ Biomassa}$$

The value of carbon stock per hectare is obtained by calculating using equations:

$$\boldsymbol{C\ total\ (ton/ha) = \sum \frac{Tree\ carbon}{Plot\ size\ (ha)}}$$

The results conducted by ICRAFT state that the equations issued by Katterings, Chave, Brown, and Basuki give the value of carbon deposits that are not significantly different from the 100 cm diameter limit. The data used to produce biomass value information is Diameter at the Breast High data (DBH). All biomass values of the species found at the study site were calculated using the equation. Furthermore, the value of carbon deposits is obtained from the results of tree biomass conversion multiplied by conversion factor of 0.47.

2.4.2.7 Statistical analysis method

To find out the real difference value of carbon stock in each land cover, a statistical test is needed. The statistical tests used were ANOVA Test and Tukey's Advanced Test. The tests are used because:

a. Facilitate analysis of several different sample groups with minimal risk.

b. We can get the significance of the average difference (μ) between one sample group to another. Although the numerical difference is large, but based on ANOVA analysis, the difference could be not significant so the difference in μ can be ignored. On the contrary, it may be numerically small difference, but based on ANOVA analysis, the difference is significant, so that there is at least one different μ and the difference of μ between sample groups should not be ignored.

c. Analysis of variance is relatively easy to modify and can be developed for various forms of more complex experiments. In addition, this analysis also has relevance to regression analysis. As a result, its use is very wide in various fields, ranging from laboratory experiments to advertising, psychology, and community experiments.

2.4.2.8 Patch analysis

The HCS Approach uses a HCS Forest Patch Analysis Decision Tree to determine the importance and prioritisation of each forest patch and whether it needs to be included in the conservation plan, given its size, shape, and connectivity to other patches, riparian zones, peat areas, or High Conservation Value (HCV) areas. Patch analysis is carried out in accordance to HCSA Toolkit.

2.5 GHG calculation

The calculation of the proposed development areas were carried out in June 2019. The calculation of GHG emissions covered the potential of the planting area in PT LAP and 6 planned Kas Desa plantations around the concession of PT LAP. Several scenarios are made to find the optimal land use plan.

2.5.1 Assessment team and their qualification

The GHG calculations are carried out by Sustainability Departments that have experiences in GHG calculations since 2015. Each member involved has experience and knowledge in calculating GHG, analysis of land cover and calculation of carbon stocks. Their qualifications are as follows:

Dr Gan Lian Tiong

He earned a Doctorate in Agriculture Science from Gent University, Belgium in 1985. He has more than 44 years of experience working on plantations including sustainability in the last 15 years. Dr. Gan had participated in the ProForest HCV workshop in Kuala Lumpur in 2003, Life Cycle Analysis training in Japan in 2005 and 2006, had conducted HCV assessments and GHG calculations on PT Musim Mas group plantations. Dr. Gan also serves as the co-chairman of the ERWG and was a member of the BoG and a member of BHCVWG.

Budi Tri Prasetia

He earned a Bachelor of Forestry from Agricultural Institute of Bogor, Indonesia 2007. Since joining Musim Mas in 2008, Budi has been involved in HCV-HCS management & monitoring implementation, Landuse and landuse change analysis, participatory mapping and landuse planning. Budi had participated in ISCC GHG emission training in Kuala Lumpur 2014. Since 2008 he had participated in several HCV, HCS, social impact assessments and GHG calculations on PT Musim Mas group plantations.

Alexander Liang

He earned a Bachelor of Engineering in Chemical Engineering from the North Sumatera University, Indonesia in 2018. Since joining Musim Mas in 2018, Alexander is responsible for GHG emission calculation. Alexander also previously played a role in registering for the CDM project monitoring and verification. Alexander has attended the Life Cycle Analysis training provided by ILCAN in April 2019.

Erickson Purba

He obtained a Bachelor of Forestry from the Department of Forestry Management, Faculty of Forestry, University of North Sumatra in 2013. Since joining Musim Mas in 2014, Erickson has been involved in mapping, analyzing land cover, interpreting satellite images and GHG. Erickson is experienced in using software for mapping and GIS such as ArcGIS, Map Info, Er Mapper and Quantum GIS. He also experienced in carbon stock assessment and monitoring of HCV areas.

2.5.2 GHG calculation method

2.5.2.1 Land cover stratification and soil type

2.5.2.1.1 Stratification of land cover

The land cover map obtained from the PT LAP HCSA assessment report (which includes HCV areas and map) cover the area of PT LAP 1 and PT LAP 2 as well as 1 km surrounding area around the concession. Analysis of land cover is carried out at the proposed development areas. Landsat 8 OLI_TRS Satellite Images with acquisition dates of 3rd August 2016 (http://www.usgs.glovis.gov) and Sentinel-2 Satellite Image with with acquisition of 7th April 2016 were used in land cover stratification. Polygons of the assessment area are superimposed on Landsat / Sentinel-2 Satellite Imagery and then the land cover in the polygon is classified. The extent of each change in land use is determined by the results of the classification.

References used in land cover stratification include: Appendix 2 of RSPO RaCP 2014 by Compensation Task Force, Carbon Measuring Tool issued by RSPO (Suksuwan, S. 2012. Updated June 2014 http://www.rspo.org/) and "Guideline 3 Appendix on Remote Sensing Methodology on HCV Compensation Proxy Approach" by the 2013 CTF - RSPO Team. Those references are used to interpret land cover classifications from satellite data. Verification of the results of satellite image stratification is carried out using field surveys and other secondary information sources, for example AMDAL, HCV reports, etc. The Cohen Kappa is used to determine the accuracy of satellite image stratification.

2.5.2.1.2 Stratification of soil type

The soil map from the soil survey is used to determine the type of land in the concession. For simplification, non organic areas are combined into one category called mineral soil regardless of the actual soil type of the area. Information on soil types has been included in scenarios and land use planning maps. The results of soil type stratification were then combined with land cover stratification to make a soil category matrix. GHG emissions or sequestration generated from the development of these land categories are used to map GHG emission hotspots and provide a basis for developing planting scenarios.

2.5.2.2 Carbon stock assessment

In order to comply with Criterion 7.8 of 2013 RSPO P&C (7.10.2 of 2018 RSPO P&C), information on the carbon stock is required in order to 'forecast' the balance of emissions and sequestration associated with a proposed development. Carbon stock value of the vegetation are taken from the PT. LAP and PT MP HCSA report (which includes HCV areas and map) that were conducted in 2017. Carbon stock values for cultivated area and oil palm are obtained from from the default values provided in the "RSPO GHG Assessment Procedure for new plantings, October 2016" (RSPO, 2016).

2.5.2.2.1 Vegetation carbon stock

The estimation of the carbon stocks value for vegetation in this report refers to the carbon stocks value measured in the field carried out by PT LAP/PT MP in 2017. Measurements of field carbon stocks were carried out with reference to the High Carbon Stock Approach Toolkit version 2 published by HCSA. The results of the assessment have gone through the quality review process and have been published on the HCSA website on April 19th 2018.

After the estimation of the carbon stock per land cover class has been obtained from field measurement, the estimates related to total carbon stock per land cover class in the planned area of oil palm plantation development can be done by simply multiplying the area of each land cover class (ha) with carbon stock value (tC). The area of each land cover class can be easily calculated using GIS software.

2.5.2.3 GHG emission hotspot map

The various land categories will emit or sequester different amount of carbon dioxide (CO_2) to the atmosfer after land conversion to oil palm plantation. The carbon dioxide (CO_2) emission or sequestration is then amortized over 25 years to give an annual GHG emission or sequestration. Carbon stock of oil palm is taken from the default value in "RSPO GHG Assessment Procedure for New plantings, October 2016."

2.5.2.4 Development scenario

Four land use scenarios are developed in the assessment area. Their potential emissions are estimated using the New GHG Development Calculator released in August 2016.

GHG calculator for new plantation development estimate emissions from palm oil production, and from changes in land use. Net GHG emissions exceed the full harvest cycle (default value is 25 years). The projection number of fertilizers used and the use of fuel are added to simulate operational emissions in the future.

2.5.2.5 Team responsible for developing the mitigation plan

The team responsible for developing the mitigation plan was led by Dr. Gan Lian Tiong, Director of the Sustainability Department Musim Mas Group. Other team members are from the Sustainability Department Musim Mas Group. Information and consultations with the Estate Department, Department of Processing and Industrial Relations (HUMAS) were also carried out to assist the team to conduct the analysis.

2.6 Land Use Change Analysis (LUCA)

The Land Use Change Analysis (LUCA) was conducted on February- March 2017. The LUC analysis was covered all PT LAP location permit areas, 6 planned Kas Desa plantation and landscape around PT LAP concessions. The analysis period used included: a) between November 2004 - November 2007, b) between November 2007 - December 2009, c) between January 2010 - May 2014 and d) after May 2014. As a part of FPIC process, PT Remark Asia assessment team, represented by Mr. Sigit Budhi Setyanto as a FPIC expert, visited the villages where sample points were taken prior to doing the LUC assessment.

2.6.1 Assessment team and their qualification

This assessment was carried out by an independent party that has competence in LUCA's assessment, namely PT Re-Mark Asia. The LUCA was led by Amirul Ikhsan with the help of 2 other people who played a role in both GIS and field observations.

Amirul Ikhsan

Amirul studied in the field of Cartography and Remote Sensing of the Faculty of Geography at Gajah Mada University (UGM). He has work experience for government organizations named Environmental and Disaster Mitigation Clinics (KLMB) Faculty of Geography Gajah Mada University as a GIS operator and surveyor in the field of Natural Disaster Mitigation, especially the area of Mount Merapi, Yogyakarta in 2010 to 2011.

He once worked at PUSPIC UGM-Bakosurtanal as a GIS Trainer and Remote Sensing for PT SMART, teaching staff of Bangka Belitung State University and Bengkalis Regional Government from 2011 to 2012. He also has experience as mapping and GIS consultants for forestry projects in 2011 and 2012.

Dian Pratiwi

Dian has participated in the Land Cover Change Analysis project at the Indonesian Peatland Network Project with CIFOR 2014 in Rawa Aopa Watumohai National Park, Southeast Sulawesi Province. Another project that she has been followed is the mapping of mangrove areas with the Ministry of Maritime Affairs and Fisheries in Tangerang. In addition, he worked at PT Rimba Makmur Utama (Katingan Project) in peat restoration activities in Central Kalimantan in November 2015 until February 2017. Since 2014, Dian has been worked in the field of GIS, Remote sensing and biodiversity. Currently she works as a freelance in the HCS, HCV, CSA, and LUCCA activities.

Aditia Nugraha

He received a bachelor's degree from the Department of Silviculture, Faculty of Forestry, Bogor Agricultural University in 2013. He worked at the Citarum Ciliwung Watershed Management Agency in 2015 until 2016. He joined Sonokeling Accreditation Nusantara as an Associate Consultant in September 2016, he then joined Re-Mark Asia in February 2017 as an Associate Consultant.

2.6.2 Land use change analysis (LUCA) method

2.6.2.1 Data and information used

Analysis of Land Use and Land Cover Change (LUCCA) was carried out using satellite images of several acquisition dates. Ideally, the satellite imagery used is the image covered in the intended cut-off month (November 2005, November 2007, January 2010 and May 2014).

There are some of satellites available in the right combination in terms of resolution and spectral bands. The minimum requirements of the image that can be used in analysis are images with a resolution of 30 m. However, the possibility of high to very high resolution data is needed to be able to distinguish among types of land cover, especially types of forest cover. Satellites that can be used include the Landsat Satellite Image (30 m), SPOT Satellite Image (10 m) or RapidEye Image (5 m).

Taking into account the potential variability of available images for specific locations and times, in accordance with the requirements and guidelines of the RSPO, it is necessary to use multiple data sources (a combination of high and very high resolution images) to facilitate interpretation of land cover, so the interpretation results will be more accurate. In addition, to further validate the image interpretation process, groundtruthing is necessary.

The use of satellite imagery for analysis of land cover, does not always correspond to the cut-off periods specified by RSPO. However, due to the availability of good quality satellite image data (covered by clouds or poor image quality) in the intended period is not available, so the altenative satellite imageries that is close to the period determined by RSPO are used for the analysis.

Satellite image data used in the LUCA the proposed development areas are as follows:

a. Landsat 5 TM Satellite Images 18th August 2004 and 1st June 2004.
b. Landsat 5 TM Satellite Images 13th February 2006 and 4th March 2007.
c. Landsat 5 TM Satellite Images 26th April 2009 and 1st September 2009.
d. Landsat 8 OLI TIRS Satellite Images 24th June 2013 and 10th October 2013.
e. Landsat 8 OLI TIRS Satellite Images 3rd of September 2016.

2.6.2.2 Stages and process of land use cover change analysis

The stages and process of Land Use Changes Analysis (LUCA) refer to the Remediation and Compensation Procedures issued by the RSPO, especially on page 27 of the document. Overall, the stages and processes of LUCA analysis are as follows:

a. Stage 1: Procurement process, including downloading satellite image data with specification of a resolution of at least 30 meters.
b. Stage 2: Pre-processing or initial processing, covering atmospheric effects, geometric correction and satellite image data processing operations from the period to be used.
c. Stage 3: Interpretation, covering the interpretation of land cover from pre-processed satellite image data, by referring to the vegetation coefficient specified in the remediation and compensation procedures.
d. Stage 4: Ground truthing (field verification), includes verification activities in the field by proving field conditions on the results of the initial interpretation of satellite images of land cover.
e. Stage 5: Image validation and reinterpretation, including the process of validating the satellite images from previous interpretations by making corrections that refer to the results of field checks.
f. Stage 6: Make a map of the results of a change analysis, covering the process of making a map of the land cover map that has been validated with the results of field checks to be displayed in the report.

2.6.2.3 Preliminary analysis of satellite image data

The initial analysis was carried out through processing satellite image data from several periods of coverage using ArcGis software and continued with interpretation of vegetation cover or land cover which refers to the RSPO land cover classification system based on the value of the vegetation coefficient. The results of this activity are the results of interpretation of satellite imagery for the entire study area with an initial analysis of land cover classification. In the analysis of changes in land cover used two types of satellite images, namely (i) Landsat 5 TM with a spatial resolution of 30 m, and (ii) Landsat 8 OLI with a spatial resolution of 30 m, for the latest land cover analysis when conducting LUCA studies.

2.6.2.4 Ground truthing

Ground truthing was carried out by determining the sampling plots on the field. Sampling points of these land cover is taken with representation of existing land cover types or types of land cover coefficients. Sampling points also consider the locations that difficult to differentiate from satellite image and need to be verified on the ground. The proportional random sampling method was used in the analysis. The number of the sampling plots taken is determined from each land cover category or land cover coefficient identified from the results of satellite analysis by taking into account the size of each land cover class. The observations in the sampling field also pay attention to the forest cover class. The sampling point in the forested area will have greater proportion compared to other land cover such as oil palm, shrubland or open land.

Verification of land cover in the field is carried out by using the check List sheet that was prepared before to record all conditions in the field. The data collected includes location of the sampling point, GPS coordinates, type of land cover, canopy conditions around it, observation time and date, etc. To find out the history of land management and utilization, the assessment team also conducted interviews with surrounding communities and PT LAP's employees who had worked long enough at PT LAP from the beginning of land clearing.

The results of field verification are used to calculate the accuracy of the land cover classification by comparing the land cover from the interpretation of satellite images with the land cover identified during field verification. Accuracy tests are then carried out to find out whether the results of the initial interpretation are acceptable or not. Corrections to the results of the initial land cover interpretation were also conducted to increase the accuracy of the results of the land cover interpretation. Verification activities and accuracy tests are only carried out for interpretation of land cover at the time the study was conducted.

2.6.2.5 Data processing and analysis of land cover changes

The data used for LUCCA activities are satellite image data with different times and years of coverage to see whether there is a change in land cover for each period, includes:

a. Before November 2005 (RSPO Principles & Criteria were first applied).

b. November 2007 (deadline for trial implementation of RSPO Principles & Criteria).

c. Before 1st January 2010 (the introduction of the RSPO New Planting Procedure).

d. After May 2014 (after the new planting procedure takes effect).

2.7 Social Impact Assessment (SIA)

PT LAP has conducted a social impact assessment (SIA) for this location permit area. The social impact assessment activities were carried out in 4 villages, namely 1) Batu Mas Village, 2) Cegolak Village, 3) Betenung Village, Nanga Tayap District and 4) Tanjung Beulang Village, Tumbang Titi District, Ketapang Regency, West Kalimantan. The implementation of the Social Impact Assessment activity was carried out on February 28 to March 4, 2017, it was carried out effectively for 3 days and involved 2 review teams, interviewing around 78 interviewees, 2 stakeholders and holding 5 informal meetings and 1 formal meeting.

Before the assessment, PT LAP management had conduct socialization to the local government and the surrounding community to get approval from local community on social impact assessment implementation on March 16th-18th, 2016. Based on feedback taken during the socialization, the local communities have no objection to the proposed activities.

As a part of FPIC process, the social impact assessment team from PT Remark Asia has also visited the local government and traditional leader. The visit was represented by Mr. Sigit Budhi Setyanto as a FPIC expert. He visited the villages where sample points were taken prior to doing the social impact assessment.

2.7.1 Assessment team and their qualification

This assessment is also carried out by teams that have competence in social impact assessments from PT Re-Mark Asia. The assessment was carried out by Herry Triyana who has expertise in social, cultural and community empowerment studies, CD/CSR and technical facilitation and Redy Miraz Muslim who has expertise in social studies and technical facilitation. The experience and qualification of the assessment team are as follow:

Herry Triyana

He was graduated from the Faculty of Forestry, Department of Forest Management, Bogor Agricultural Institute, in 1995. From 1996 to the end of 2007 he worked at the United Nations, which around 8 years at UNDP and around 3 years at the FAO. In 2008 until now he joined the consultant PT Daemeter Consulting as a freelance for the HCV 5 & 6 and Social Impact Assessment (SIA). In addition to PT Daemeter Consulting, it is also active in several consultants as freelancers, namely PT Remark Asia, PT Ideas Consulting, PT Wana Kestava, PT Kyara Solusi Indonesia and PT Pandu Maha Wana / Asia Pacific Consulting Solutions (APCS) which are engaged in the field of forestry as a Social Sciences expert, Community Empowerment and CSR as well as a surveyor for the field of forest potential inventory and has a certificate of Periodic Comprehensive Forest Inventory (IHMB).

Redy Miraz Muslim

He was graduated from the Faculty of Forestry, Department of Forest Management, Bogor Agricultural University, in 1995. From 1996 to the end of 2014 he worked at PT GlaxoSmithKline for about 9 years and at Merck Sharp & Dohme for about 6 years, as a Key Account Executive. In 2015 he joined the consultant PT Penta Sumberdaya Nusantara Consulting (freelance) for the HCVF 5 & 6 (Social Aspects) and Social Impact Assessment fields. Besides at PT Penta Sumberdaya Nusantara Consulting, he also active in other consultants as freelancers, such as in the Swakelola Foundation of the Forestry and Plantation Agency Ciamis District which is engaged in forestry as a Social Sciences Specialist, Community Empowerment and CSR as well as a surveyor for the field of inventory of potential forests and has a certificate of Periodic Comprehensive Forest Inventory (IHMB). From May 2016 joined PT Kyara Solusi Indonesia Consulting (HCV 5 & 6 and SIA Consultants).

2.7.2 Social Impact Assessment method

In the proposed development areas, the scope of the Social Impact study was carried out in the internal and external environment of the proposed development areas. The Social Impact Study activities were carried out in 4 villages covered by the decree, namely 1) Batu Mas Village, 2) Cegolak Village, 3) Betenung Village, Nanga Tayap District and 4) Tanjung Beulang Village, Tumbang Titi District. The method or technique used in the Social Impact Assessment process consists of:

a. **Literature Review.** The literature review is carried out to gain an understanding of the social and environmental context of the study area, carried out in the initial stages before going to the field and at the results analysis stage.

b. **Dialog.** Dialogue is carried out to identify relevant parties, explore issues that become impacts, explore hopes, ideas and aspirations to get solutions to the issues that occur.

c. **Field Observation.** Field observations were carried out to understand directly the facts of the field which was an indication of the occurrence of issues and social impacts that occurred.

d. **In depth Interview.** The in depth interview was conducted to explore and gain a deeper understanding of the emerging issues from selected key figures who were respondents.

e. **Triangulation.** Triangulation is done to cross check issues, opinions, and ideas that exist to eliminate incorrect information.

f. **Social-Learning Cycle.** SIA is not a one-time linear process but a continuous process, which functions as social learning to respond to environmental changes that occur. The Social Impact Assessment was carried out in all villages within the location permit area except the Pateh Benteng Village that expressed rejection of the presence of the survey team in their village.

The implementation of the Social Impact Assessment in the field is carried out by following the following principles:

a. **Participatory**; identifying issues and extracting information is done in a participatory manner. This participatory approach places participants as subjects to map the social issues they experience, express their opinions and aspirations, and engage in designing management and monitoring.

b. **Multistakeholder**; identification of issues and information gathering is carried out in a multi-party manner by involving parties who directly or indirectly give and or receive impacts.

c. **Rapid and Ex-ante**; identification of issues and information retrieval is carried out quickly and more based on estimates (forecast) of trends in changes that occur rather than based on accurate factual data - as a solution to the limitations of the Social Impact Assessment approach, and from the limited time available.

d. **Appreciative**; identification of issues and collection of information is guided positively, not only limited to knowing the gaps that exist, but also to explore hopes, potential, and ideas to find solutions to social issues that occur.

The goal (or vision) of social management that is to be achieved in the context of managing sustainable palm oil production is the achievement of a continuous social environment, or Social Sustainability. The implementation of the Sustainable Livelihood framework is based on the basic premise as follows: that only a sustainable social environment will contribute positively to the production processes and the long-term growth and development of the company. The Social Impact Assessment is carried out within the framework of the 'Social Sustainability' approach. In this case there are five components of social sustainability, namely: 1). Human capital, 2). Natural capital, 3). Financial capital, 4). Social capital, and 5). Physical capital. Each component of the capital consists of elements. The scope and focus of identification of these elements is based on issues that are seen or felt important by stakeholders (stakeholders). The results of identifying the issues from the parties were then verified and explored in the field.

3. Summary of finding

3.1 SEIA

3.1.1 Positif and negative environmental impact

Table 2. Summary of potential impact

No	Project phase	Potential impact
1	Pra construction	
a	Socialization	- Local communities' perception (positive/negative) - Changes of community income (positive)
2	Construction phase	
a	Reqruitment of contractor workers	- Increasing community income (positive) - Local communities perception (positive/negative)
b	Mobilization of equipment and material	- Decreasing ambient and air quality (negative) - Local communities perception (positive/negative)
c	Land clearing and conditioning	- Decreasing air quality (negative) - Increasing noise (negative) - Decreasing quality of river water (negative) - Decreasing diversity of flora (negative) - Decreasing diversity of fauna (negative) - Decreasing the diversity of species and quantities of water biota (negative)
d	Development of mill and supporting facilities	- Changes of community income (positive) - Decreasing air quality (negative) - Increasing erosion (negative) - Decreasing quality of river water (negative) - Forest and land fire (negative) - Decreasing the diversity of species and quantities of water biota (negative) - work accident - Decreasing the quality of public health
3	Operational phase	
a	Reqruitment of operational workers	- Increasing employment opportunity (positive) - Increasing community income (positive) - Decreasing quality of river water (negative) - Decreasing ground water quality (negative) - Decreasing the diversity of species and quantities of water biota (negative) - Work accident (negative)
b	Operations of palm oil mill and waste management	- Changes of community income (positive) - Increasing employment opportunity (positive) - Decreasing air quality (negative) - Work accident (negative)
4	Post operation stage	
a	Asset management	- Local communities' perception (positive/negative)

3.1.2 Socio-economic impacts on the state, regional and local communities

Indonesia is one of the largest producers of palm oil in the world and its industry has become the most valuable agricultural export sector in the last decade. The palm oil industry is a significant contributor to production in Indonesia. The social impact caused by the presence of PT LAP and oil palm companies in general is to provide foreign exchange to the state, even higher than the contribution of oil and gas. In addition, palm oil production also supports the government's energy security program by replacing imported diesel with domestic-produced biodiesel.

The palm oil industry is a labor intensive industry that can absorb a lot of labor. The absorption of this workforce contributes to increasing the income and welfare of the local community. Improvement in income and welfare of local community will improve purchasing power and stimulate spending that leads to improvement on the overall welfare of the region. The construction of infrastructure and the opening of access can stimulate regional and local economic growth. Corporate CSR programs, including the development of Village Cash can also improve the welfare of local communities.

3.1.3 Issues raised by stakeholders and assessor comments

Table 3. List of key issues in the internal environment of PT LAP's operational activities

No	Name	Position/ Organization/ Social group	Main concern/recomendation	Response
1	General statement	Local communities	The community agrees with the threats that have been described such as fire and illegal logging.	This has been discussed in the recommendations in the report
			The community agrees with the proposed HCV management and monitoring plan, involving the community in management is also needed to maintain river border conditions and other areas that are considered important.	
2	Sonda Kongko	Head of Kerta Baru Village	To reprimand other companies that planted in the river border area	The identified river boundaries at the proposed development areas in this study have been designated as HCVs and have been incorporated into the management and monitoring plan.

No	Name	Position/ Organization/ Social group	Main concern/recomendation	Response
				Regarding other companies that planted in the river banks, it is necessary to jointly with the government and the village to reprimand the company.
3	Markus	Villager of Tanjung Berulang	Requests that the Sekorun hills be kept constant and protected	Sekorun hill has been designated as an HCV area where the area has been mapped and covered in management/monitoring plan.
4	Robi Cahyadi	Head of Betenung Village	Request that PT LAP direct its CSR program to provide clean water sources.	Related to CSR programs, it can be consulted directly with the management of PT LAP.
			Confirm that in the planned Kas Desa areas, there are no protected flora fauna such as Orangutans are found, the condition of the planned Kas Desa areas is cultivation land. The planned Kas Desa area is part of the village land that has been cultivated.	This information has been recorded and described in the final report.
6	Yanto	Head of Pebihingan Village	There are rituals called “Menuba” in the Pebihingan Village. It is the ritual to summon the rain during the dry season in the Pemahan River, this poses a polemic with the Kerta Baru Village because the river is also used by the village community of Kerta Baru.	This will be discussed internally between the villages of Pebihingan and Kerta Baru because the Pemahan river is shared by the two villages.
7	Sonda Kongko	Head of Kerta Baru Village	Discussing internally related to the “Menuba” rituals, because Kerta Baru village is one of the villages that directly affected by the ritual. The ritual using poison substances in the river. This is become a problem for Kerta baru Village because Pebihingan Villagers did not use natural poisons no more, but used chemicals poisons. This is being discussed together with the two villages.	Between Pebihingan Village and Kerta Baru need to discuss the customary rituals. This undermines the existence of HCV 6 related to rivers and still maintains HCV 4, due to the use of toxic (non-organic) chemicals. The other reason is because the ritual poisoned the river and endangered other villagers.
8	Hengki	Villager	PT LAP provides health support for the village community. For example, when there is an outbreak of dengue fever and dysentery	PT LAP collaborates with Puskesmas in providing health assistance as long as needed.

No	Name	Position/ Organization/ Social group	Main concern/recomendation	Response
9	Hevi K.	BPD Batu Mas	Request support for land and forest fires to PT LAP when there is a fire in the Sekorun hill area	Fire threats have been identified in this report and have been incorporated into management and monitoring plans. The MBA program is one form of the company's commitment to prevent and control forest and land fires.

3.1.4 List of legal documents owned

Table 4. List of legal documents owned by PT LAP

No	Letter type / permit	Date issued	Subject
1	Ketapang Regent Decree Number 417 / PEM / 2015	4th June 2015	Granting of location permit for oil palm plantation development on behalf of PT LAP 2, renewal from *Bupati* Decree of Ketapang No: 73, 2010, dated on 10 Februari 2010
2	Ketapang Regent Decree Number 660.1 / 2236 / KLH-B	7th December 2015	Recommendation for UKL-UPL approval
3	Medan City Government Investment and Integrated One-Stop Service Number 02.12.1.46.11378 / 2061/2217/05/2017	22nd May 2017	Certificate of company registration
4	Medan City Government Investment and One-Stop Service Office Number 1532/1470 / 1.1 / 0401/05/2017	22nd May 2017	Trading business license
5	The Plantation Business Permit (IUP) was issued by the Ketapang regent through the Decree of the District Head of Ketapang No. 663 / DISBUN-D / 2016 (combined with location permit 1).	2016	Plantation business permit
6	Technical analysis of the function of forest No S. 28 /BPKH.III-2/2015, issued by Ministry of Environment and Forestry.	2015	Technical analysis of the function of forest area on PT Lestari Abadi Perkasa proposed areas, Ketapang Regency, West Kalimantan Province.
7	AMDAL Commission of West Kalimantan No: 92/BLHD/2015	7th December 2015	AMDAL certification
8	*Bupati* Decree No: 120/KLH-B/2016	15th February 2016	Received Permit Letter of Environment Feasibility on Oil Palm Plantation

3.2 HCV assessment

3.2.1 National and regional context

The HCV identification PT LAP 2 and the KAS Desa were located on Borneo Island (Kalimantan) which is the third largest island in the world and is divided into three countries, Indonesia, Malaysia and Brunei Darussalam. About 73% of Kalimantan belongs to Indonesia, concentrated on its central to the southern side, populated by approximately 16 million people in total (12 million live in Indonesia, 4 million in Serawak and Sabah, and 300 thousand of Brunei Darussalam's citizens). In the last decades, Kalimantan was dominantly covered by tropical rainforests, but now, the forest coverages have been continuously declining. In 1968, the forests covered about 70% of Borneo, fell to 63% in 1990, and eventually plummeted to 35% only in 2008 (WWF, 2009).

About 225 mammal species are recorded in Kalimantan, of which 44 are endemics (Payne et.al., 2000); also 639 bird species with 37 of the species are endemics (MacKinnon et.al., 2000); 208 reptiles, 113 amphibians, and 394 freshwater fish species of which 149 are also endemics (MacKinnon et.al., 1996). Some unique species are also found in Kalimantan, such as orangutan, Kalimantan gibbon (owa Kalimantan), proboscis monkey (bekantan), sun bear (beruang madu), sunda clouded leopard (macan dahan), Bornean bay cat (kucing merah), white-shouldered ibis (ibis karau), storm's stork (bangau storm) and bulwert's pheasant (sempidan Kalimantan). In total, 3.000 tree species are also found in Kalimantan, including 267 dipterocarps species, 58% endemic species, more than 2.000 orchid species, and 1.000 fern species. The endemic level of Bornean floral reaches 34% from all the existing plant species (MacKinnon et.al., 1996).

According to the official West Kalimantan's spatial planning, the total area of Cultivation Areas on Non-Forested Land (KBNK) is 6.520.622,73 ha. From the total KBNK, 4,7 million ha are potential for oil palm plantation designation, whilst 0,61 million ha will be designated for other crop estates. By now, permits for crop estate establishment have been granted for 285 private companies, accounted for 3.193.508,46 ha, where the soil and agro-climatic conditions are suitable for oil palm plantation. Increase on oil palm plantation areas and productivity is followed by escalation of local migrants from other islands.

3.2.2 Landscape context

Landscape boundaries are an aggregation of location landscape boundaries of identification of biodiversity, hydrology, and social. Location landscape boundaries identification of biodiversity is determined based on the existence of natural ecosystems and / or locations that have the potential as wild habitat, especially areas that have connectivity with HCV potential areas within the identification area such as secondary dryland forests (mixed forests) which still left or riparian area on the river border.

The concept of landscapes in HCVs considers the effect of developing oil palm plantations on the wider landscape. The landscape boundary of the area identifies environmental services based on the boundaries of the watershed or sub-watershed that includes the location of identification. The landscape boundary of the social identification location was determined based on the smallest administrative boundaries which included identification locations, namely Batu Mas Village, Cegolak and Betenung Villages in Nanga Tayap District, Tanjung Beulang Village and Batu Tajam Village in Tumbang Titi District and Pebihingan Village and Kerta Village New in Pemahan District. In this assessment, the landscape boundaries used using imaginary boundaries follow the Pawan sub-watershed and the Pesaguan sub-watershed with considerations: (a) Location and status of natural vegetation areas, (b) The main landscape, watersheds and rivers, geology and land, (c) Settlements, agricultural areas and infrastructure, accessibility of local residents, (c) Social and ethnic cultural contexts and (d) History of land use and development trends that include future plans. For connectivity of landscape boundaries the Permit area of PT LAP 2 with the operational area of PT LAP 1 is presented in **Figure 2** above.

Forest Region Status | Based on the System of Functions of Forest and Aquatic Region Map, West Kalimantan Province refers to the Minister of Forestry Decree No. 733 / Menhut-II / 2014, dated September 2, 2014, shows that the entire HCV assessment area in the PT LAP 2 location permit is in the Other Use Area (APL). Around the PT LAP area there are Protection Forests, which are northeast and southwest. Protection forests in the northeast are included in the PT LAP2 HCV assessment landscape. This Protected Forest itself has been designated as customary forest by the surrounding community, because it is a sacred hill. This Protected Forest is in the middle of the area designated as Limited Production Forest (HPT). Likewise, based on the 'Indicative Map of Moratorium of New Permit' (PIPPIB) revision XI also shows that it is not a moratorium area. The complete map of regional status is presented in **Figure 4** and the Indicative Map for Moratorium of New Permits (PIPPIB) revised XI is presented in **Figure 5.**

Land Use Cover | Analysis of multi-temporal land cover is used to see the dynamics of land cover that occurred in the PT LAP 2 permit area from 2004, 2009, 2013 and the current field conditions in 2016 which can be used as references or references in HCV assessment decisions. The results of the 2016 Landsat image land cover analysis, from the PT LAP 2 permit area, were dominated by mixed plantation cover area of 661.95 Ha or 58.07% while secondary forest cover (mixed forest)) was 110.46 Ha or (9.69%) which experienced a sufficient change in area. significant compared to land cover in 2004, 2009, 2013. Changes in land cover that occurred in the PT LAP 2 area tended to occur due to land use activities in the form of land clearing by communities both for agricultural land, mixed farm and illegal logging by parties who did not to be responsible. Information on the results of 2016, 2013, 2009 and 2004 land cover analysis in the PT LAP 2 permit area is presented in chapter 3.6 land use analysis.

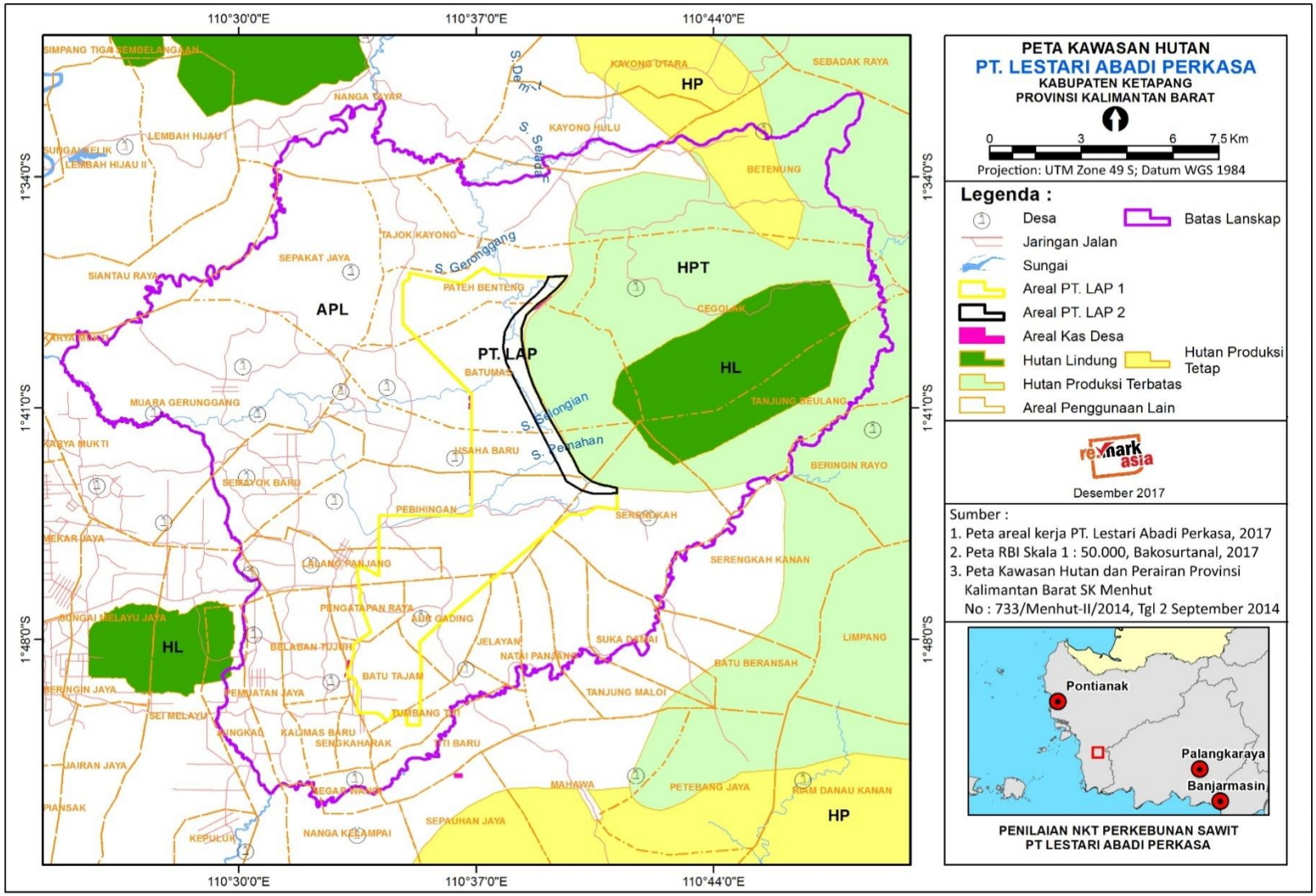

Figure 4. Map of forest status of the proposed development areas

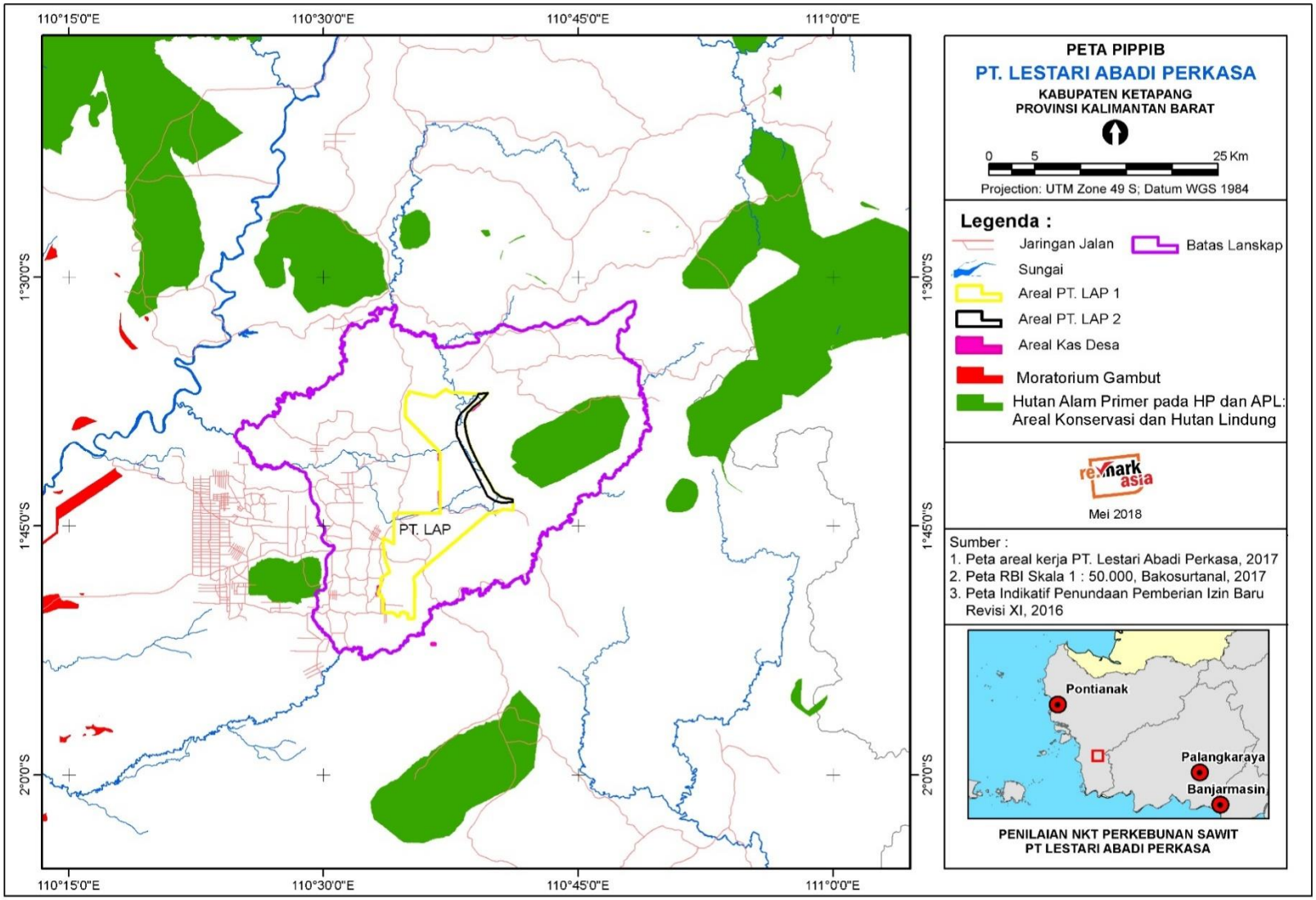

Figure 5. Indicative map of new permits moratorium (PIPIB) revised XI in the proposed development areas

Region of Biodiversity | The PT LAP 2 permit area is in the Schwaner Mountain ecoregion, this ecoregion extends from east to southwest, the hill in the ecoregion has a maximum altitude of 1,700 masl. Vegetation in the form of submontana formation has physiognomy similar to lowland forest (<1,000 masl) around it, only shorter (canopy generally not more than 35 m), small and rarely sandy. The basic shift in the forestry economy has turned into agricultural fields, rubber plantations and oil palm plantations. The Ecoregion map in the PT LAP 2 permit area is presented in **Figure 6.**

The HCV identification area is not a biodiversity priority area. This is indicated by the process of overlaying the PT LAP 2 permit area boundaries with 'Kalimantan biodiversity center maps (Borneo), such as The Heart of Borneo (HoB) Map), Important Bird Areas (IBA)) and Endemic Bird distribution Area (EBA) and Intact Forest Lanscapes (IFL)). On the regional landscape scale of Kalimantan (Borneo), the PT LAP 2 permit area is not part of the Ramsar Site), the closest distance of the Ramsar Site is to Tanjung Puting National Park. The PT LAP 2 permit area is also far from the IBA-EBA area, and almost all are outside the HoB and IFL areas. The PT LAP 2 permit area is far from the coastline and the main major river which is commonly used as a transit area for migratory shorebirds. There is no record or information regarding the encounter of registered raptor migratory around the PT LAP 2 permit area. However, secondary forests found in the hills have potential as a transit area for migratory birds. The Heart of Borneo (HoB) map, Intact Forest Landscapes (IFL), Important Bird Areas (IBA) and the distribution of Endemic Bird Areas (EBA) are presented in **Figure 7.**

The PT LAP 2 permit area also do not directly border protected areas and the surrounding conservation areas. Based on the Map of the System of Functions of Forest and Aquatic Region of the Province of West Kalimantan refers to the Decree of the Minister of Forestry No. 733/Menhut-II/2014, September 2, 2014, the closest protected area is in the form of Protected Forest about 3.4 km east and the closest conservation area is Gunung Palung National Park, about 46 km northwest. However, the PT LAP 2 permit area still has diverse biodiversity potential. Potentials that still exist in the PT LAP 2 permit area include Bukit Sekorun and the rivers that flow in the area and outside the plantation area.

Based on the Ecoregion Map (WWF, 2009) on the previous page, the PT LAP 2 permit area is a Schwaner Mountains area, the area has been degraded and is not dominated by forest areas anymore. WWF Indonesia (2009) released a thematic map map forming the island ecosystem, including an indicative map of the High Conservation Value Forest (HCVF). From the results of the HCVF map review from WWF, the PT LAP 2 permit area is outside the main distribution of flagship species and indicative maps. An indication of the HCVF map from WWF is presented in **Figure 8.**

Context of important species (IUCN Red List), the distribution of several RTE species that includes the Identification area. The RTE species are 'Trenggiling' (Manis javanica, Critically Endangered / CR), 'Owa' (Hylobates muelleri - Endangered / EN), and 'Beruang Madu' (Helarctos malayanus-Vulnerable / VU). IUCN species distribution maps are global in nature, and do not exclude urban areas, settlements and cultivated land which are less likely to be occupied by endangered species.

The HCV identification area is in line with fragments of 'Orangutan' (Pongo pygmaeus wormbi) distribution) based on Orangutan distribution maps from Greenpeace (2013) and Barnes et.al. (2016), but at the time of identification in the field there were no signs of the presence of Oangutans. The surrounding community also stated that the existence of Orangutans was not in the Identification area. Orangutan Distribution Map from Greenpeace (2013) and Barnes et al. (2016) is presented in **Figure 9 and Figure 10.**

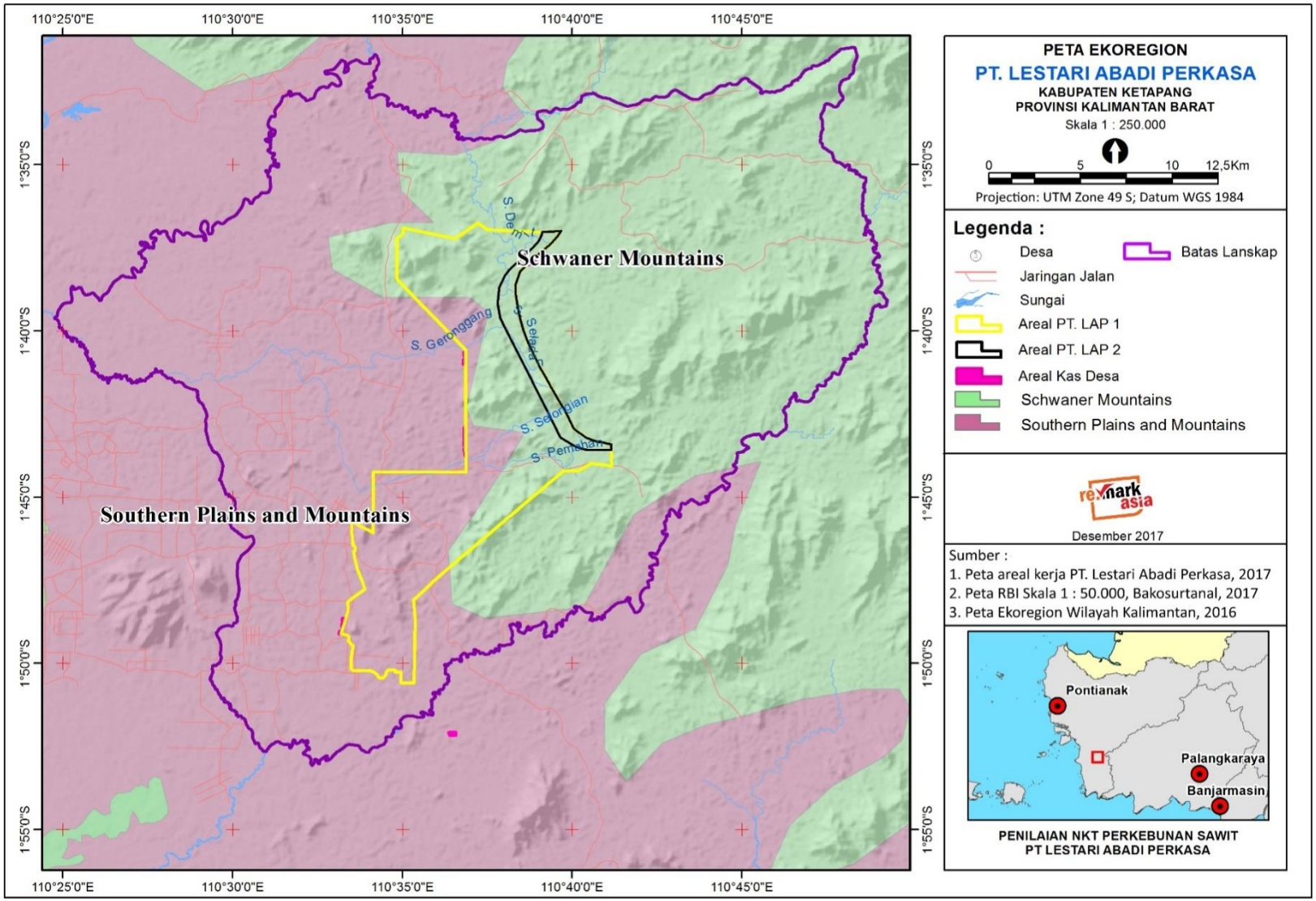

Figure 6. Map of ecoregion in the proposed development areas

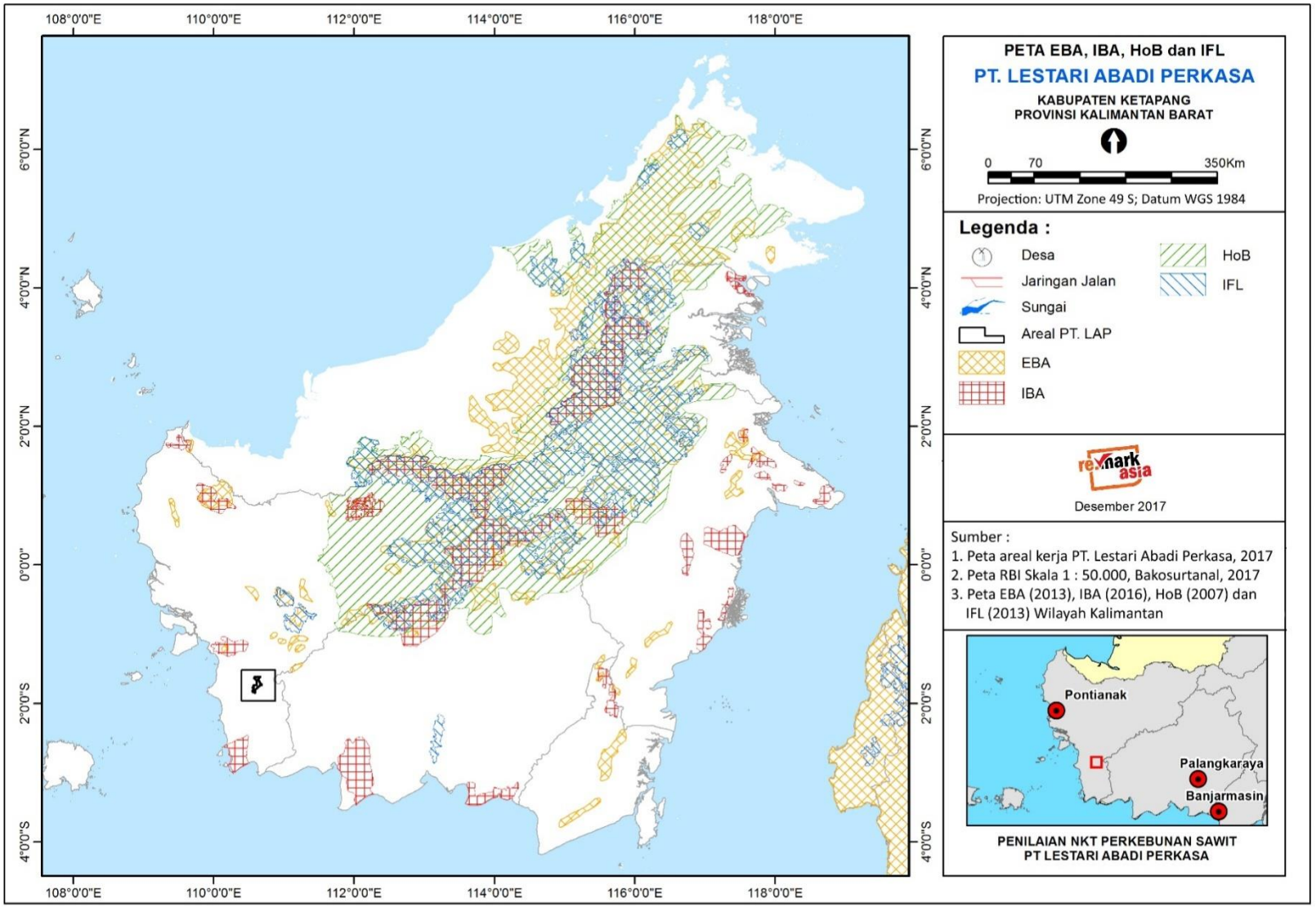

Figure 7. Map of The Heart of Borneo (HoB), Intact Forest Landscape (IFL), Important Bird Areal (IBA) and Endemic Bird Areal (EBA)

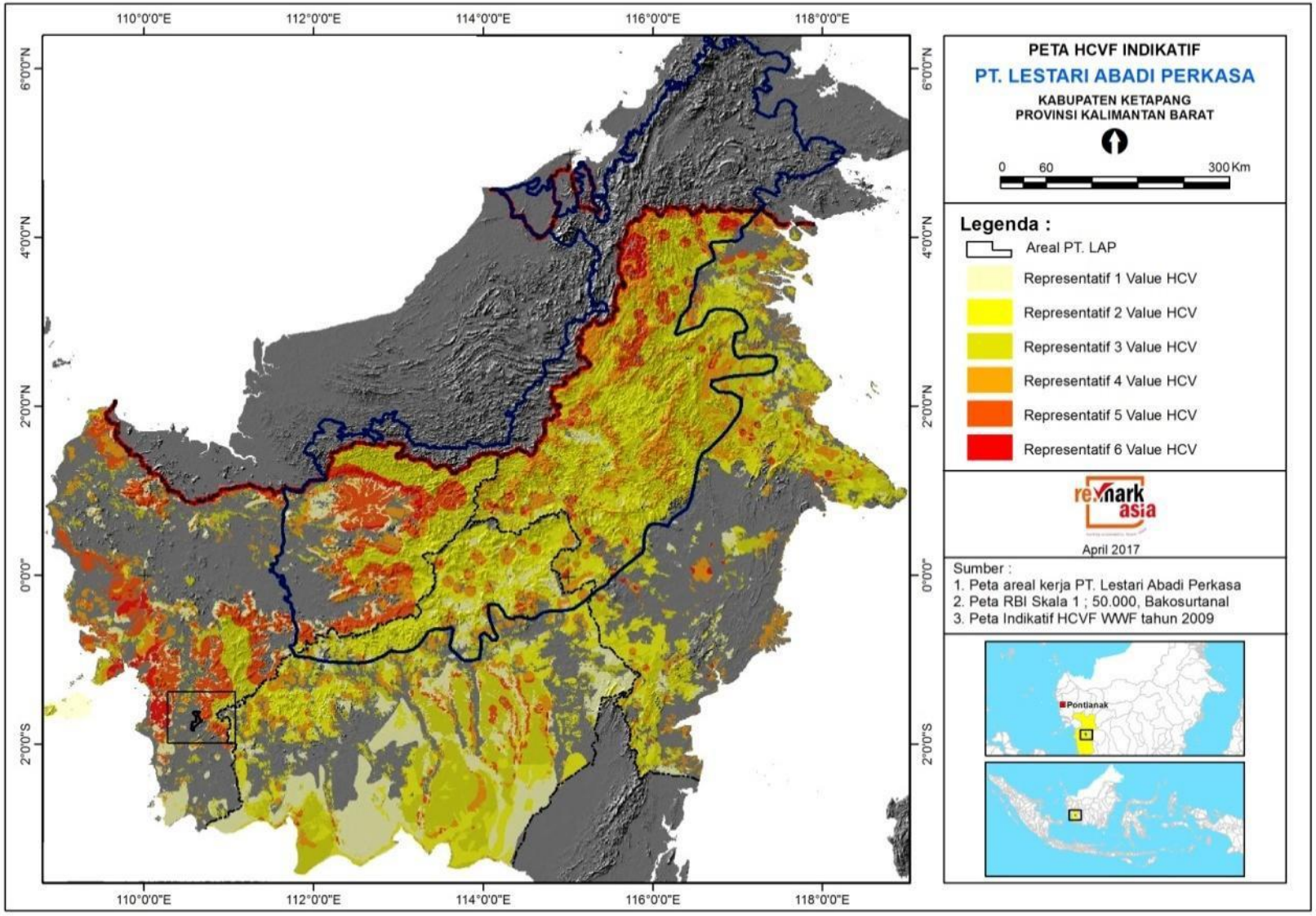

Figure 8. An indication of the HCVF map in Kalimantan (Source: Prihatna, WWF, 2009)

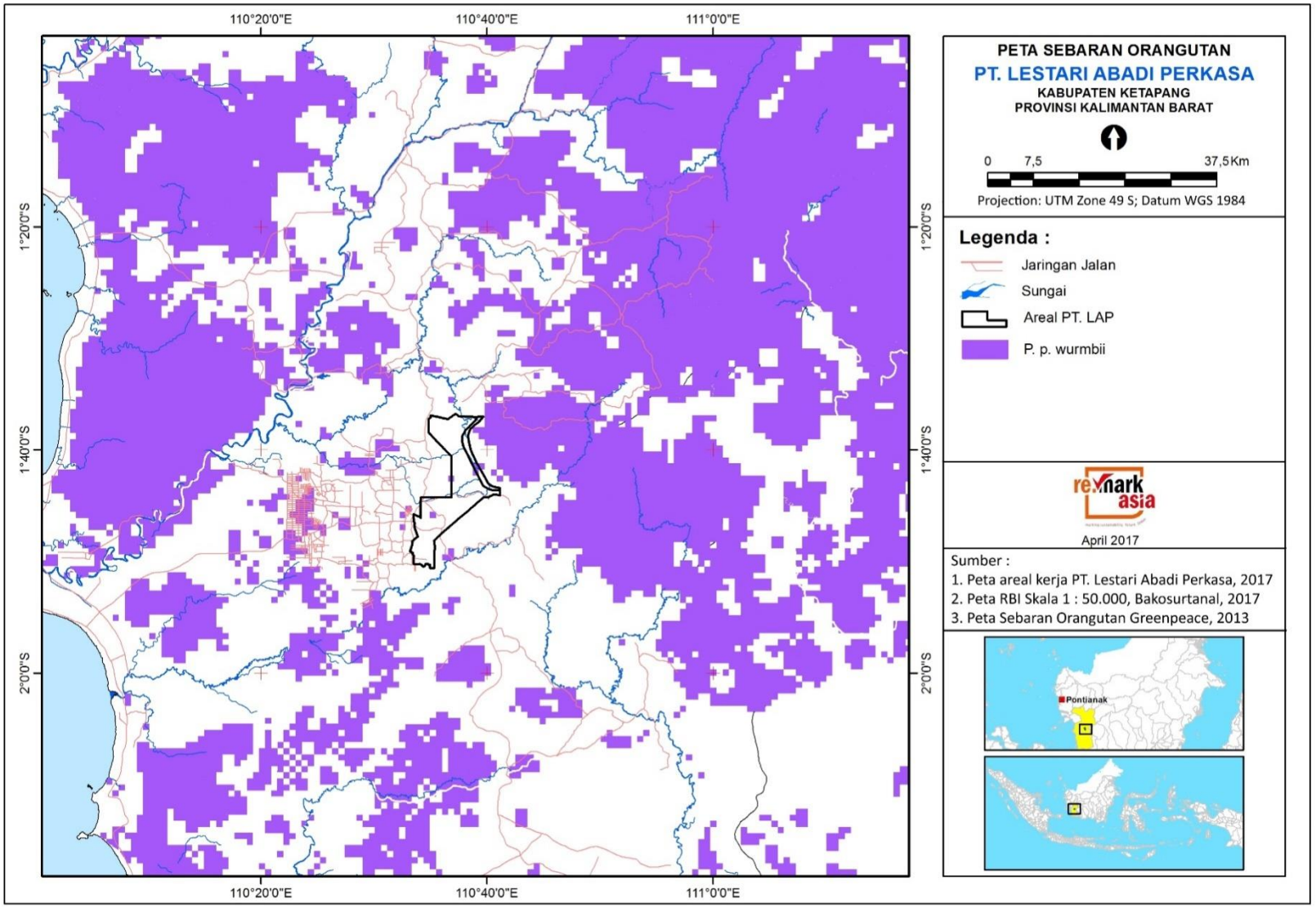

Figure 9. Map of distribution of Orangutans from Greenpeace (2013)

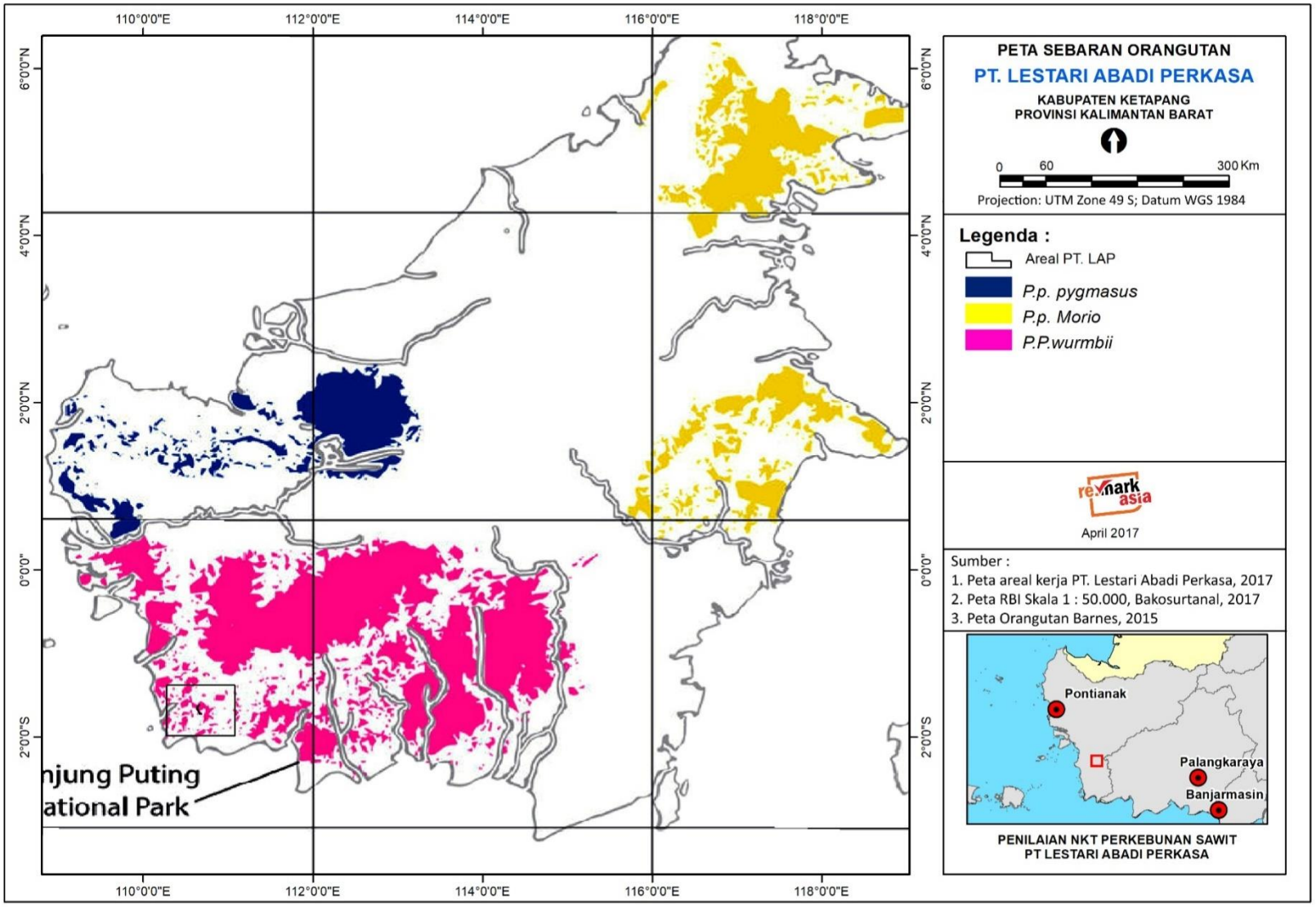

Figure 10. Map of distribution of Orangutans from Barnes et. al. (2016)

3.2.3 Physical

Climate | Based on the Schmidt-Ferguson climate classification system, the PT LAP 2 Permit area has "A" climate type, meaning the region has a wet climate with high rainfall throughout the year. Based on the Oldemean et.al classification, this region has "A" climate type too, meaning this region has a number of consecutive wet months (rainfall> 200mm) ranging from 9-11 months and dry months (rainfall <100mm) smaller than two months. Rainfall in this region in one year ranges from 2500-4700 mm/year with rainy days of more than 200 days. Based on the RePPProT land system map, the average air temperature in this region is between 22-30° C with relative humidity around 90%. High rainfall conditions and the number of rainy days of more than 54% in a year indicate that this region has high rainfall erosion value.

Hydrology | Rivers that cross the PT LAP 2 permit area consist of 5 rivers, which are dominated by the Pawan watershed with an area of 925.73 ha or around 81.16% and the Pasaguan watershed with an area of 214.92 ha or around 18.84%. Map of the watershed in the PT LAP 2 permit area is presented in **Figure 11.**

Geology | Based on the Geological Formation Map of Kalimantan Island, there are 2 geological formations in the PT LAP 2 permit area which are dominated by Sukadana Granite (Kus) with an area of 752.83 ha or around 66%, the second Kerabai Volcanics (Kuk) formation covering 387.82 ha or around 34%. Sukadana Granite (Kus) Formation consists of granite biotite, diorite, diorite quartz and granodiorite. The map of the Geological Formation in the PT LAP 2 permit area is presented in **Figure 12.**

Land System | The land system in the PT LAP 2 permit area consists of 3 land systems dominated by the Telawi Land System (TLW) with descriptions of being at an altitude of 50-800 masl, granite, schist, andesite, basalt, grandiorite, with an area of 793. 14 ha or around 69.53%. Second, the Honja (HJA) Land System with descriptions is located at an altitude of 20 - 120 masl, type of hilly land, igneous rock and undulating terrain. Type of granite, granodiorite, schist, andesite, basalt with an area of 199.37 ha or around 17.48%. Third, the Bukit Pandan Land System (BPD) is a metamorphic mountain ridge with steep slopes> 60% and 300 m relief, ridge width <50 m without a valley, with an area of 148.14 ha or around 12.99%. The HJA and BPD land system is a land system that composes the dipterocarp forest ecosystem in metamorphic rocks. Whereas the TWI land system is a lowland dipterocarp forest ecosystem in granite rocks. Both ecosystems are included in the category of threatened ecosystems. Land system information is presented in **Figure 13.**

Soil Type | Type of Land based on 1984 USDA Soil Taxonomy in the PT LAP 2 permit area consisting of 3 types of land associations dominated by 'Tropudults; Dystropepts; with an area of 808.44 ha or around 70.88%. Second, 'Tropudults; Paleudults; with an area of 178.97 ha or around 15.69%. Third, 'Dystropepts; tropudults; Paleudults' with an area of 153.23 ha or around 13.43%. The type of land

based on Dudal and Supraptohardjo from the Bogor Soil Research Center Classification System, 1981, in the PT LAP 2 permit area there are 3 types of land associations which are dominated by Granite soil types with an area of 808.0 Ha (70.9%), soil types Granite, Granodiorite, Skis, Andesite, Basalt with an area of 179.0 Ha (15.7%) and soil types Gneis, Filite, Quartzite, Skis, Andesite, Basalt with an area of 153.0 Ha (13.4%) presented in **Figure 14.**

Topography and Elevation | Based on the SRTM Digital Elevation Model (DEM) with a spatial resolution of 90 meters, the topography of the PT LAP 2 area is between 25 - 200 masl. While the slope class found in the PT LAP concession area is generally only a slope class of 0 - 8% (flat). Slopes above 40% (steep) are only found on the Sekorun hill. Map of slope class in PT LAP 2 permit area is shown in **Figure 15.**

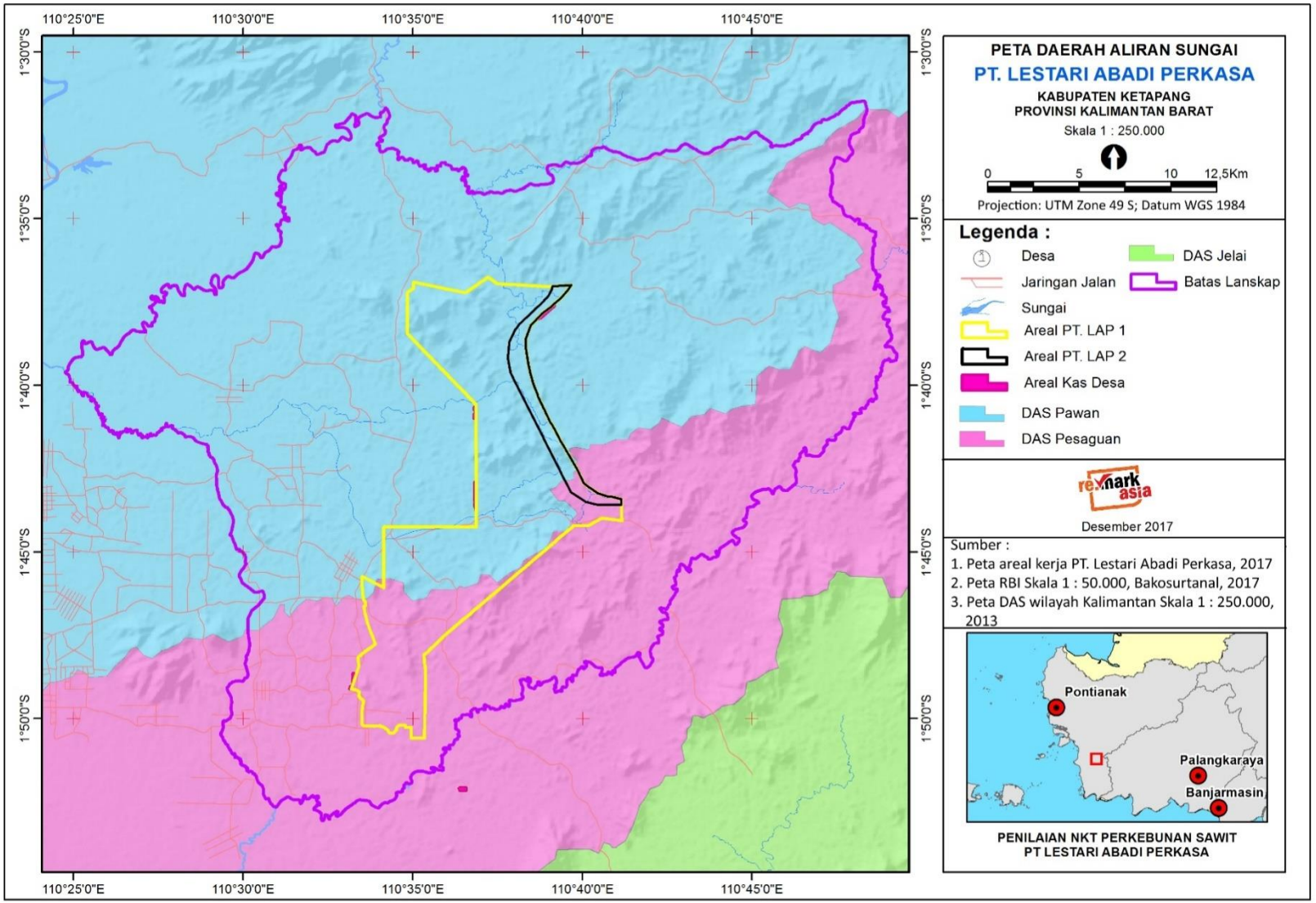

Figure 11. Map of watershed / catchment area in the proposed development areas

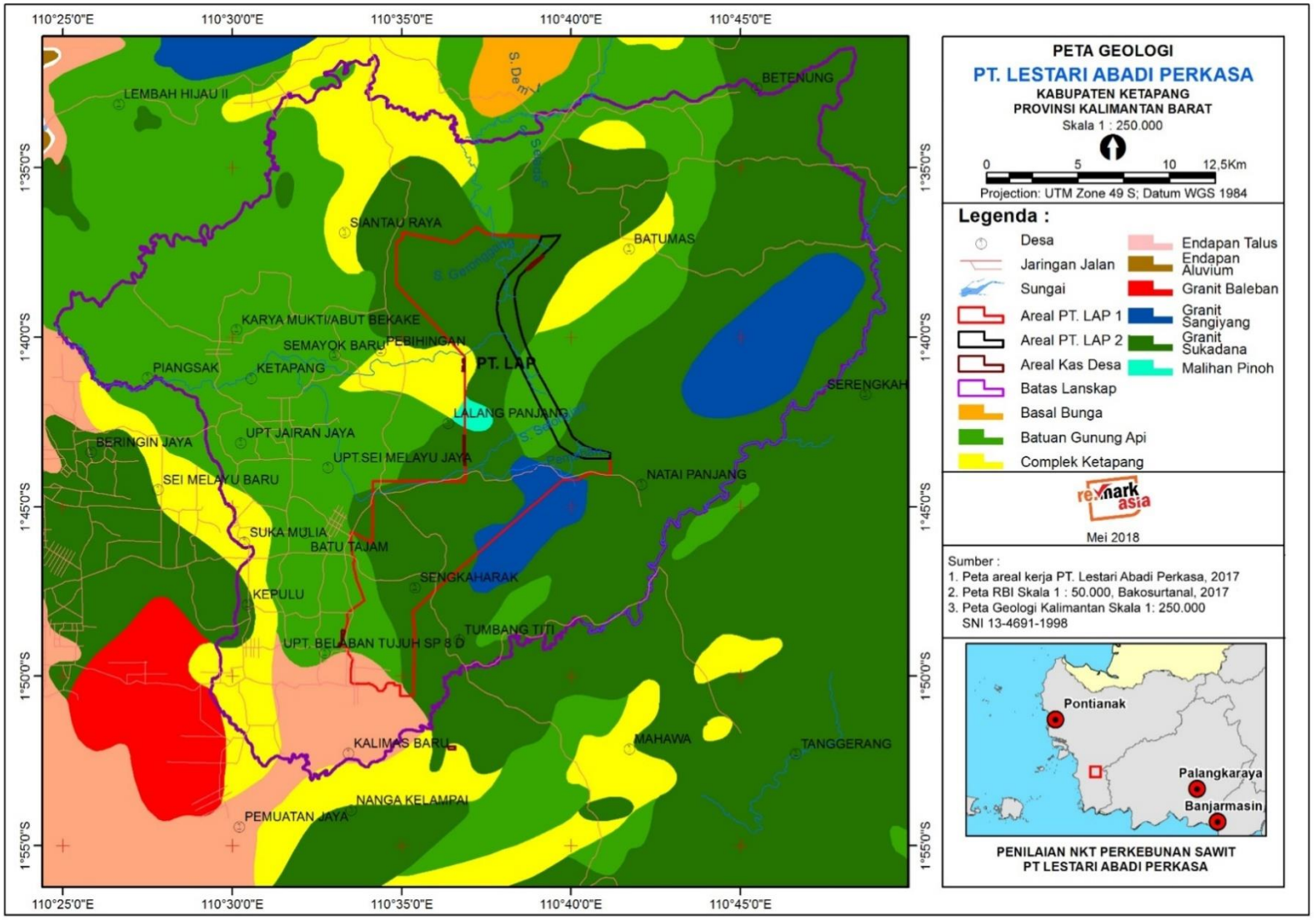

Figure 12. Map of Geological Formation in the proposed development areas

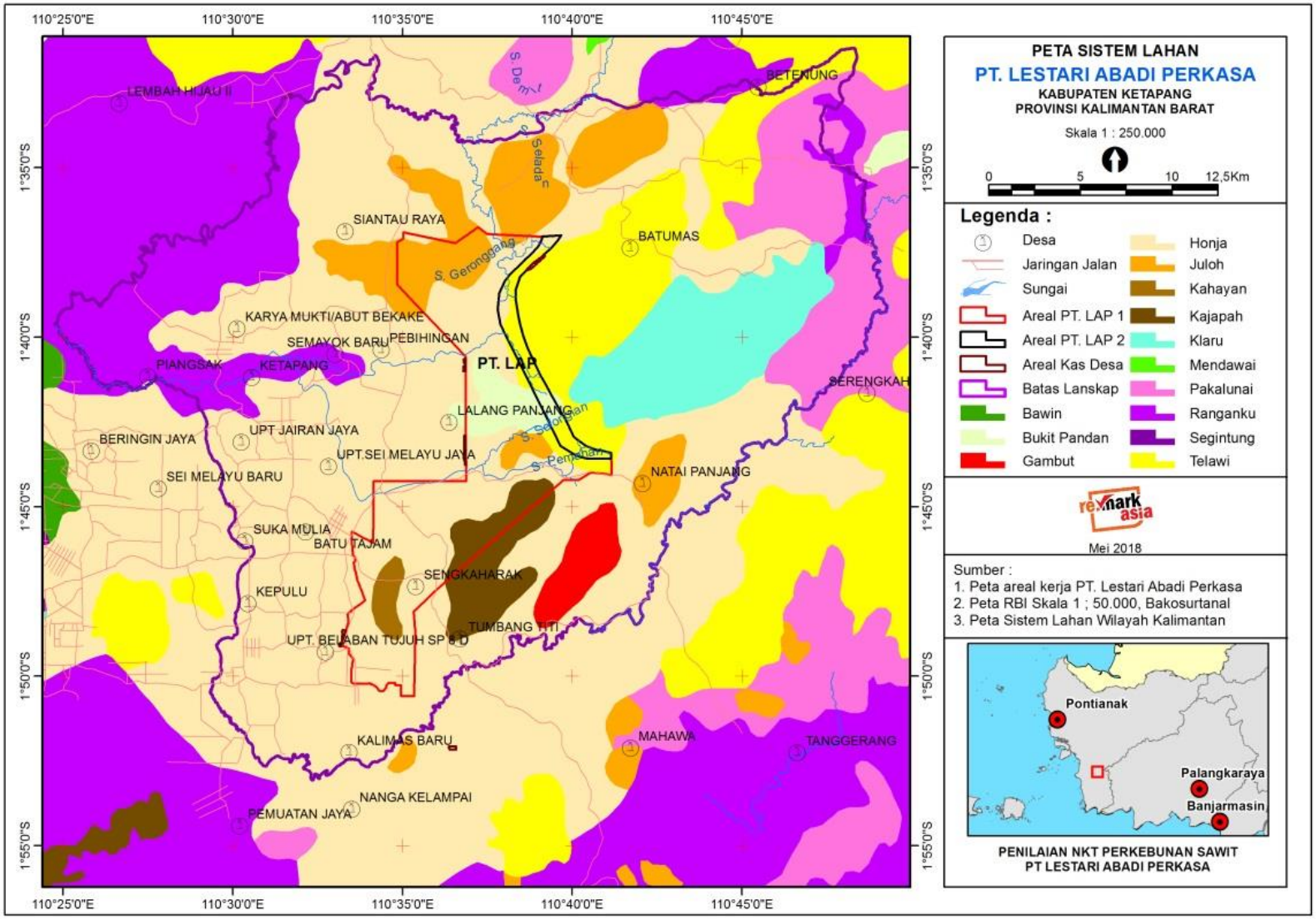

Figure 13. Map of Land System in PT LAP 2 permit area and Village Farm (Kebun Kas Desa).

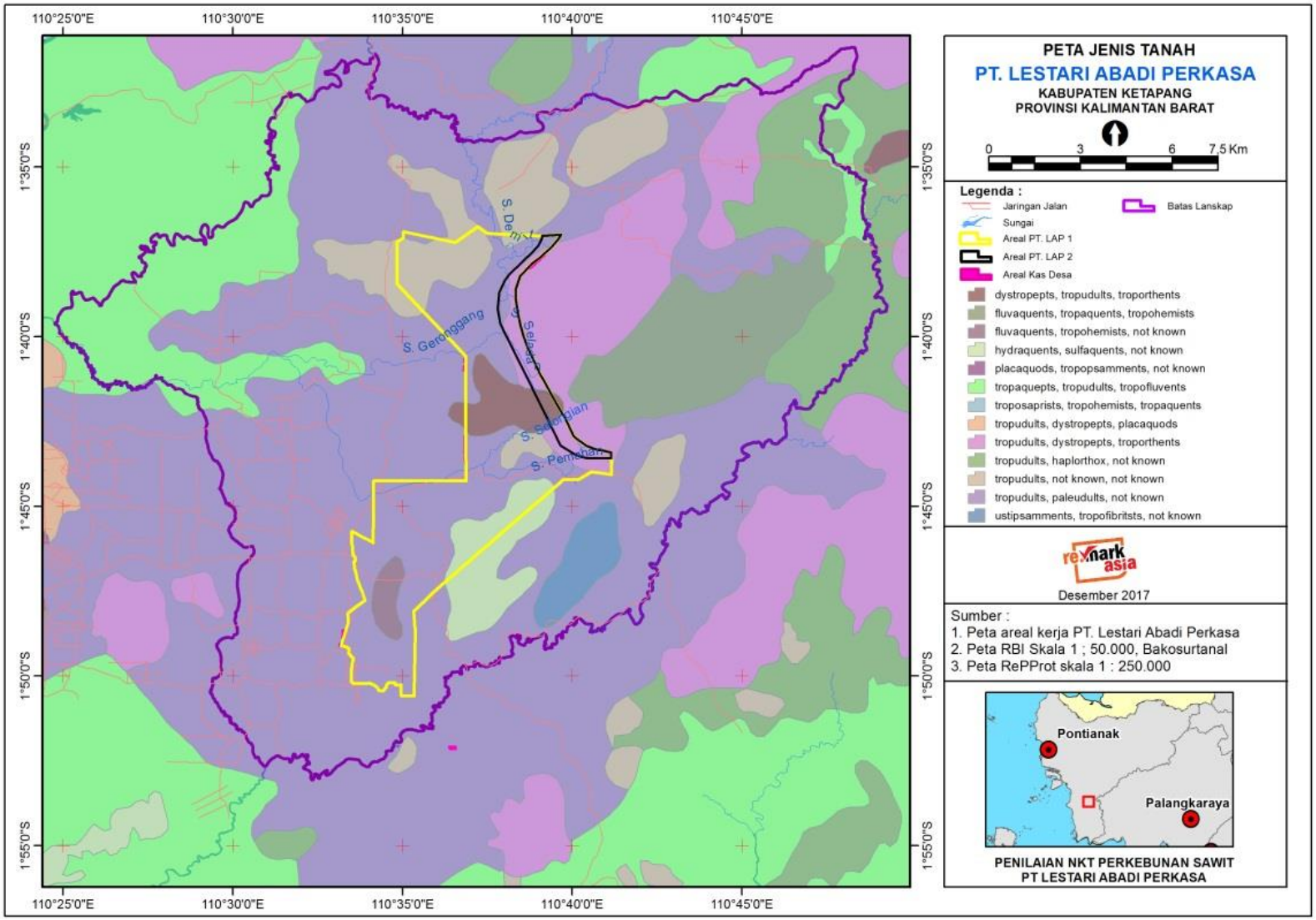

Figure 14. Map of Soil Type in PT LAP 2 permit area and Village Farm (Kebun Kas Desa).

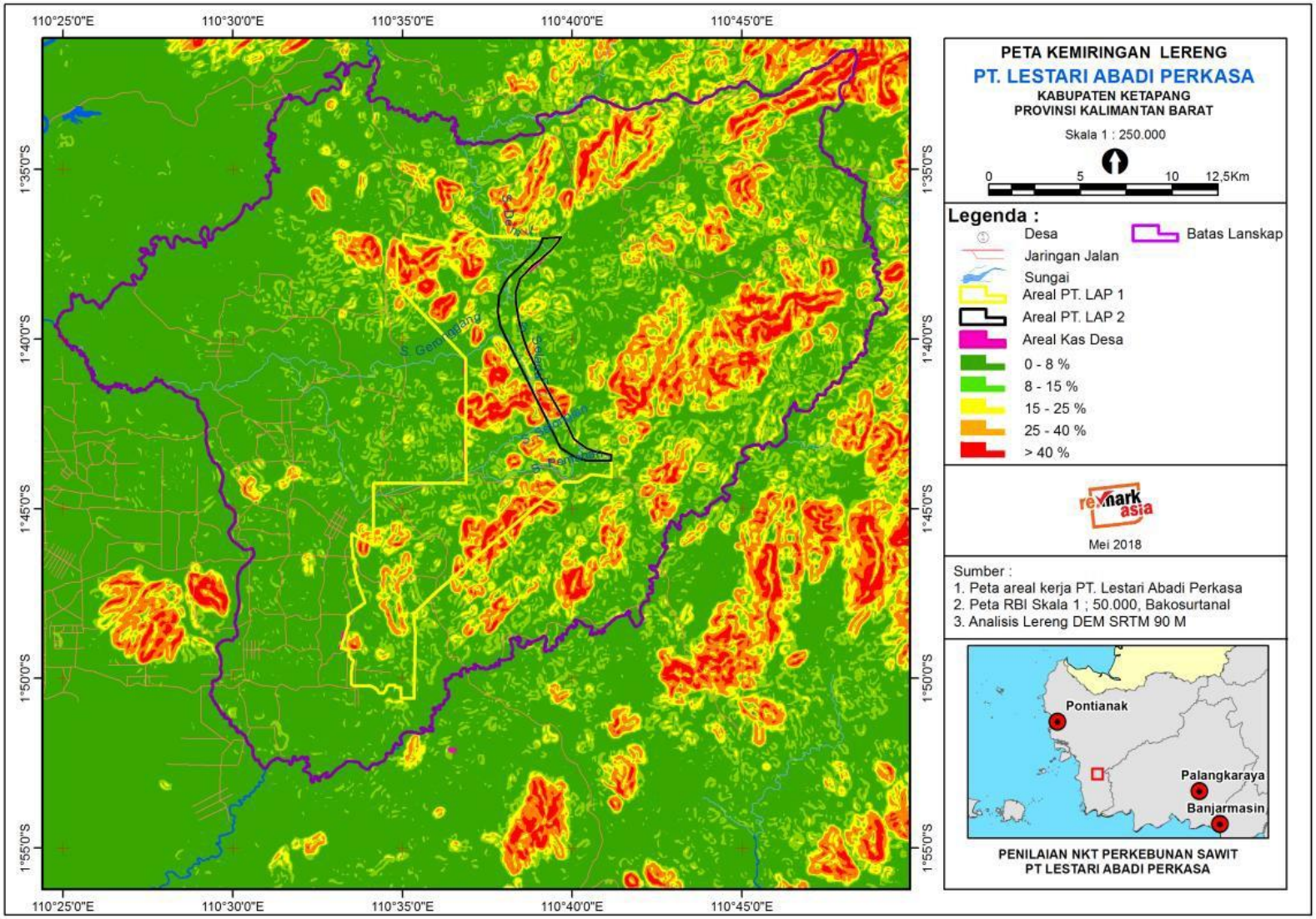

Figure 15. Map of Slope Class in PT LAP 2 permit area and Village Farm (Kebun Kas Desa)

3.2.4 Social and Culture

The surrounding villages of the assessment areas comprise a 388 km2 or 1,2% from total area of Ketapang District, inhabited by 2.050 households or 7.714 people or 1,6% from total population of the district. The 91,5% or 1.875 households in these villages realy on agricultural or 'farming activities', focused on natural and land resources utilization.

The Dayak Sub-Ethnics living in the surrounding villages, depend on dryland farming as their main livelihood, involving paddy rice with rubber garden as the main commodities, incorporated with other seasonal crops like corn, pepper, taro, pulses, various fruits (banana, papaya, jack fruit, mango, durian), vegetables (eggplant, tomato), rattan and bamboo. Traditional cultivation technique involving slashed and burnt land preparation, plowed, tilled, and harvested with traditional tools, followed by traditional ceremony are implemented. As shifting agriculture, fields are left in a fallow phase when soil fertility is felt deteriorate. Apart from this farming as main livelihood, some people also work in oil palm companies, pulp and paper plantation forests, also collect fish as an additional income or for local consumption. As local people have learned oil palm cultivation from the surrounding companies, they have been starting to plant oil palm on their own lands, also, establishing swallow natural nest breeding.

Moreover, the assessed villages are mostly populated by Dayak Pesaguan Hulu, Dayak Gerunggang and Dayak Kayong Ethnic, embracing Christian and Catholic religion. The custom leader play roles as a chief in solving particular customary cases and leading some customary rituals and ceremonies. Customary practices, traditions, and local cultures related to natural resources are still implemented, like harvesting ceremony, although part of it has been influenced by religious sights. Other rituals associated with human life cycle, such as birth ceremony, wedding and funeral are generally taken place on worshiping place, following their religion’s views. Map of Dayak sub-ethnic diversity on PT LAP assessment areas and the surroundings is presented on **Figure 16.**

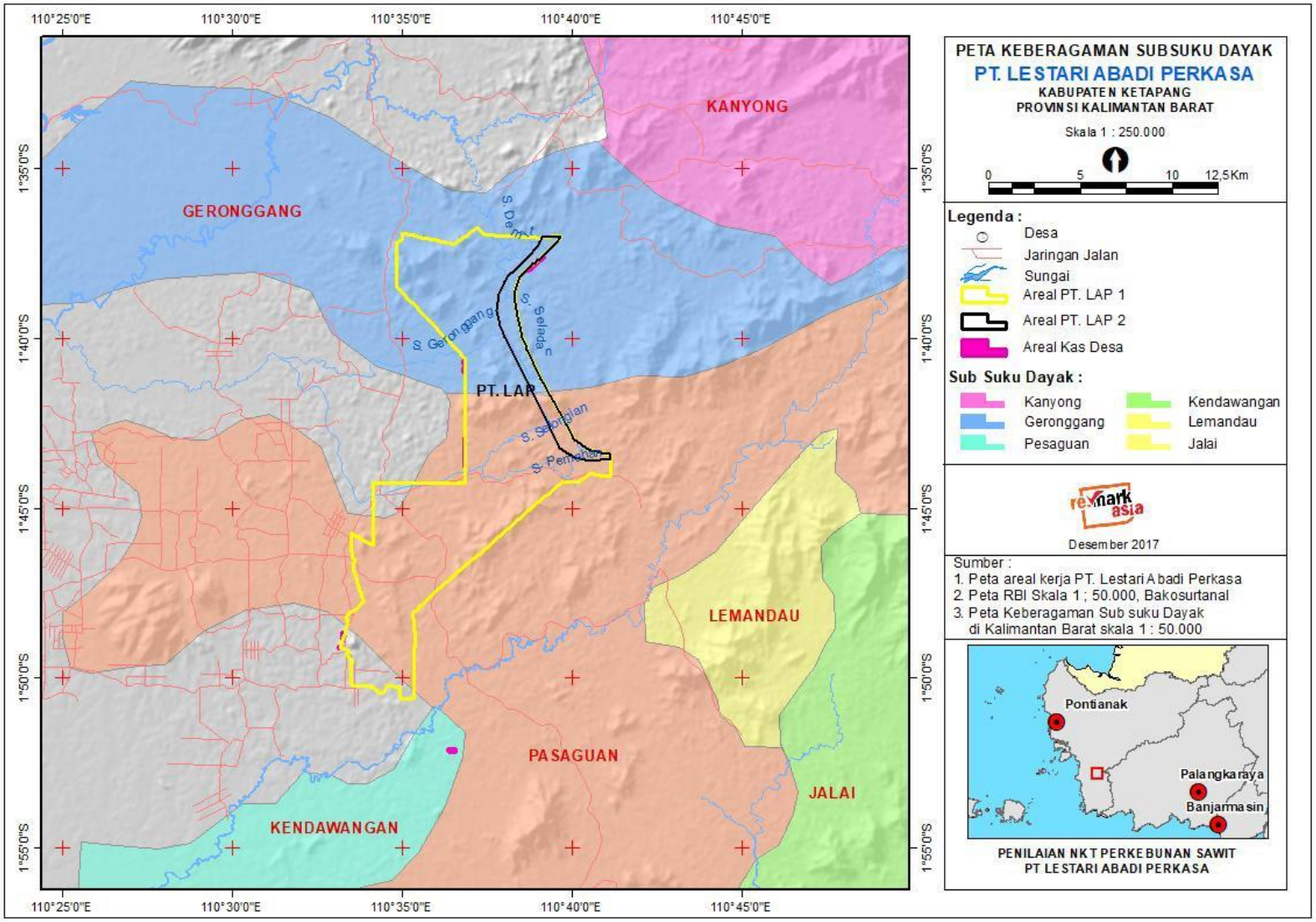

Figure 16. Map of Dayak sub-ethnic diversity on PT LAP 2 permit area and the surroundings Village Farm (Kebun Kas Desa)

Health facilities in villages are available, such as Puskesmas, Sub-Puskesmas and Polides are sufficient along with medical personnel. The sub-district health center has available inpatient facilities with medical doctors and if an ambulance is needed to be recommended to the Regional Hospital. The practice of gathering by utilizing herbal ingredients from either the forest or cultivation has been scarce done by the community, almost all medicines are obtained from the Puskesmas, medical doctors, midwives (both buying and assistance) or buying light medicines in many available stalls.

Basic education facilities and teachers are also available in almost every village, for middle-level education facilities, they must share with other villages all of which have been calculated according to elementary school graduation. Middle level education is only available in the sub-district capital, with adequate asphalt road access accessible to students.

In all villages in the HCV identification area, they have used natural sources of clean water around the village with pipelines distributed to each village for further distribution. PDAM facilities are only available in Batu Mas Village. Residents also have used dug wells and drill wells with electric pumps. The clean water network of the PDAM or independent pipeline triggers every household to build a family bathroom and toilet and improve environmental sanitation of the household and village. However, because people have a culture that cannot be separated from river water, there are still quite a lot of people who use river water to meet their daily needs. especially in the dry season as a substitute for MCK water. Rivers in the PT LAP 2 location permit area all crossed the PT LAP 1 area (main area) and have been designated as HCV areas including HCV 5. Seladan River and Demit River flow to Betenung Village, Geronggang River flows to Batu Mas Village, Sungai Pemahan and Sungai Selongian flow to Kerta Baru Village and Pebihingan Village and continue downstream.

In all villages in the HCV identification area PT LAP 2 has been served national electricity distribution (PT PLN) since the early 2000s. The presence of an electricity distribution network also makes communication easier with the installation of communication towers by Telkomsel. The community is also more dynamic by getting information ease through TV media.

From the results of observations in the field, it was shown that most of the houses were in the form of wooden houses which were built when the availability of wood was still abundant or inherited from his parents. At present, the availability of wood has been greatly reduced, the price is quite high and the location of wood resources is quite far from the village.

Permanent or nomadic herders who use resources or locations in the forest or on communal land specifically for grazing areas are not found. Historically the Dayak ethnicity at the location of identification did not have herding skills.

The income of the families of the community around the PT LAP 2 permit area was mostly obtained from the work of oil palm plantation companies or HTI companies and from the income from the cultivation of independent oil palm plantations or plasma as well as the proceeds from the cultivation of keret and other commodities. The development of the local economy also triggered independent community service businesses that also used local human resources.

3.2.5 Result and justification

Table 5. Justification on the presence or absence of HCV value in the proposed development areas

HCV 1: Concentrations of biological diversity including endemic species, and rare, threatened or endangered species, those are significant at global, regional or national levels.		
Present	**Potential**	**Absent**
a. There is a small population of RTE species, such as gibbons / (*Hylobates muelleri* - EN), Sun bears (*Helarctos malayanus* - VU), Pangolin (*Manis javanica* - CR) and fauna species protected under PP No. 7/1999. b. There are still fauna included in the CITES Appendix and IUCN Redlist as vulnerable / VU, critical / EN categories and critical categories / CR. c. There are still important or protected species found, among others: Crested serpent eagle (*Spilornis cheela*), Black eagle (*Ictinaetus malayensis*), Changeable hawk (*Nisaetus cirrhatus*), Black hornbill (*Anthracoceros malayanus*) and Rhinoceros hornbill (*Buceros rhinoceros*). d. Important types of flora such as Keruing (*Dipterocarpus trinervis*), Pekawai (*Durio kutejensis*), Belian or Ulin (*Eusideroxylon zwageri Teijsm. & Binn.*), Meranti (*Shorea spp.)* And Bengkirai (*Shorea laevis Ridl.).*		
HCV 2: Large landscape-level ecosystems and ecosystem mosaics that are significant at global, regional or national levels, and that contain viable populations of the great majority of the naturally occurring species in natural patterns of distribution and abundance.		
Present	**Potential**	**Absent**
a. Identification sites are not included in the Intact Forest Landscape (IFL), priority areas for biodiversity protection (Conservation Area or HoB), Ramsar site, IBA and EBA. b. Regional landscapes generally consist of secondary forest that has been fragmented, shrubs or shrubs, and community cultivated land. c. The study location does not intersect or is directly adjacent to a protected area or conservation area. The closest protected area is in the form of Protected Forest, about 3.4 km East and the TNGP Conservation Area which is about 46 km Northwest. d. However, the connection between the LAP 2 area and protected forest is high. The corridors are secondary forest, old thicket and river border.		
HCV 3: Rare, threatened, or endangered ecosystems, habitats or refugia.		
Present	**Potential**	**Absent**
a. Additional location permits are included in the Schwaner Mountains ecoregion with the Pakalunai (PLN) land system, a little Honja (HJA) and Bukit Pandan (BPD). The PLN land system is a lowland dipterocarpa forest ecosystem in volcanic rocks which are included in the category of rare and		

threatened ecosystems. b. There are dipterocarpa forest ecosystems that still can be found in Lintar Hill, which is a row of hills that connects to Sekorun and Lambung Hills.		
HCV 4: Basic ecosystem services in critical situations, including protection of water catchments and control of erosion of vulnerable soils and slopes.		
Present	**Potential**	**Absent**
a. The border on the river body still has sufficiently intact vegetation in the form of secondary forests and old shrubs which play an important role in maintaining the stability of the border and maintaining riparian ecosystems and forming green belts on the riparian buffer zone. The condition of vegetation, although some form of mixed gardens belonging to the community is still quite good and is a habitat for wildlife, especially birds, so it is important as a high conservation value area in terms of biodiversity. b. The presence of the Geronggang and Pemahan Rivers and the Sekorun Hill area where the vegetation is still good or forested and important to be maintained as a water catchment conservation area and control of surface erosion, especially there are settlements in the downstream and agricultural cultivation that require water.		
HCV 5: Sites and resources fundamental for satisfying the basic necessities of local communities or indigenous peoples (for livelihoods, health, nutrition, water, etc...), identified through engagement with these communities or indigenous peoples.		
Present	**Potential**	**Absent**
a. People still use river water for day-to-day use especially in the dry season as MCK water substitution. Next to the area of PT LAP 2 all across the IUP area of PT LAP 1 and has been designated as HCV area including HCV 5. Sungai Seladan and Demit River flows to Betenung Village, Sungai Geronggang flows to Batu Mas Village, Pemahan River and Selongian River flows to Kerta Baru Village and Panggalingan Village and continue to downstream. b. Daily household appliances using modern equipment made from metal or plastic, in limited quantities there are still household appliances from traditional / natural materials made from wood, bamboo and rattan, such as tables and chairs, beds and fishing gear. c. The community has long abandoned herbal or other extraction methods from forest products directly from nature in an effort to fulfill their basic needs. Fulfillment of basic needs of carbohydrates and animal protein is obtained by buying, and the rest from cultivation.		
HCV 6: Sites, resources, habitats and landscapes of global or national cultural, archaeological or historical significance, and/or of critical cultural, ecological, economic or religious/sacred importance for the traditional cultures of local communities or indigenous peoples, identified through engagement with these local communities or indigenous peoples.		
Present	**Potential**	**Absent**
	There are still “Pedahasan” and potential fields and there are indications that old tombs are still respected (depending on the generation level) even though some have not been maintened.	

3.2.4 Size and distribution of HCV area

Based on the results of field data collection and analysis of all data, it was found that in the proposed development areas there were six categories of HCVs, namely HCV 1, HCV 2, HCV 3, HCV 4, HCV 5 and potential HCV 6. The HCV area of PT LAP 2 is spread across 6 locations with a total indicative area of 537.18 ha or 47.12% of the total of PT LAP 2's permit area. HCV 1 and HCV 4 areas are identical in terms of location, shape, and area. Rivers, borders and steep and still forested hilly areas are typologies of HCV areas and are the main focus in HCV management in the PT LAP 2 permit area related to the preservation and protection of HCV areas. While the PT LAP 2 HCV Management Area (HCVMA) which is integrated with the PT LAP 1 IUP area has an area of 577.76 hectares or 50.68%. For all locations of planned Kas Desa (Kas Desa Batu Mas, Kas Desa Betenung, Kas Desa Cegolak, Kas Desa Sepuring Indah, Kas Desa Pebihingan and Kas Desa Kerta Baru) and the surrounding area, there were no identified areas with high conservation value.

The map of HCV area is presented in **Figure 17** and the location and indicative area of HCV areas in the proposed development areas are presented in the following table.

Table 6. Summary of the location and indicative area of HCV areas in the proposed development areas.

No	Location	Buffer (m)	HCV area		HCVMA	
			Ha	%	Ha	%
1	Shrub	-	212,86	18,67	253,31	22,22
2	Sekorun Hill	-	150,19	13,17	150,19	13,17
3	Secondary forest	-	46,49	4,08	46,49	4,08
4	Seladan River	50	30,41	2,67	30,55	2,68
5	Demit River	50	9,86	0,86	9,86	0,86
6	Pemahan River	50	30,20	2,65	30,20	2,65
7	Selongian River	50	6,16	0,54	6,16	0,54
8	Geronggang River	50	51,01	4,47	51,01	4,47
Total HCV area			**537,18**	**47,12**	**577,76**	**50,68**
Total concession area (Ha)			**1,140**			

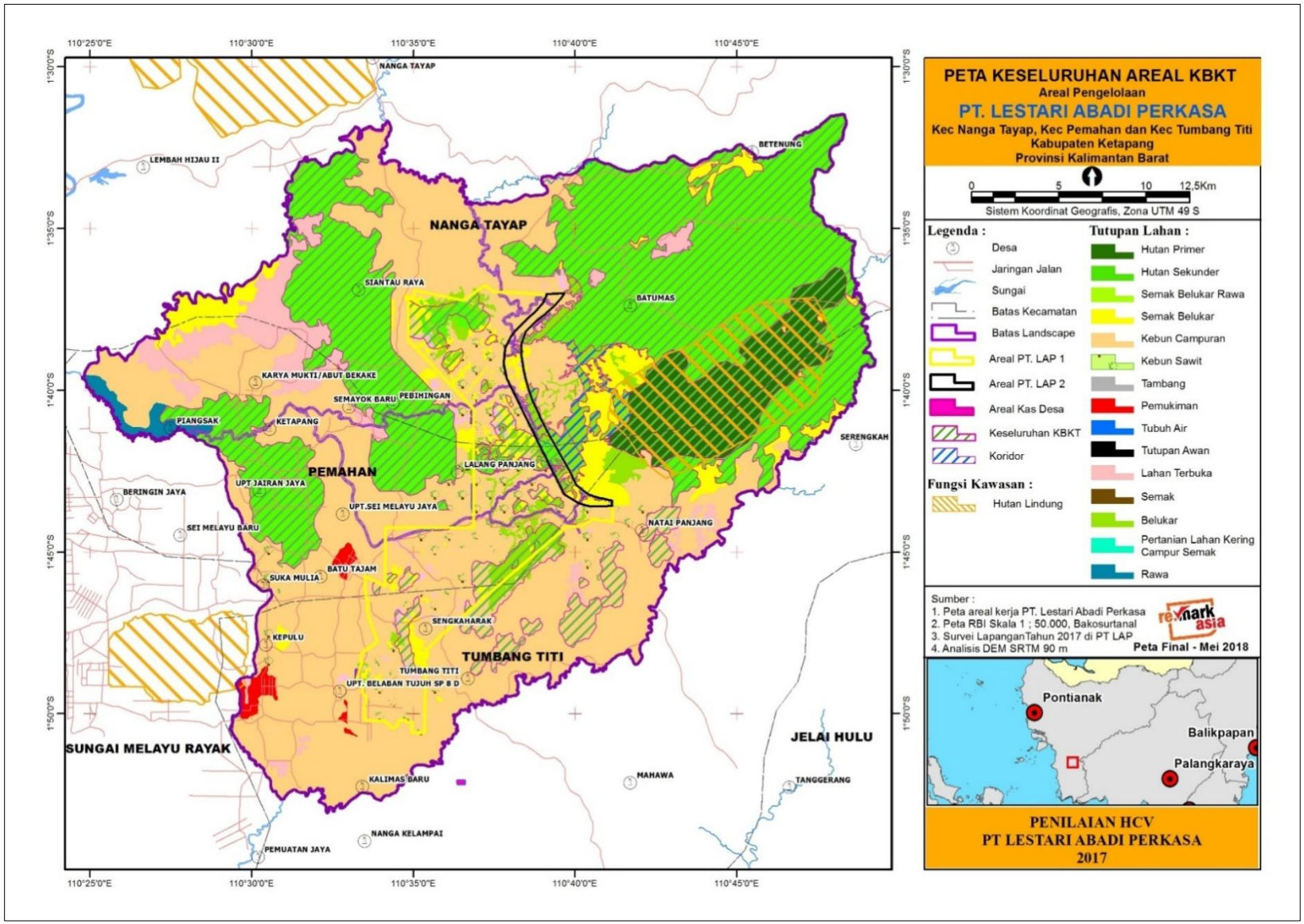

Figure 17. HCV map

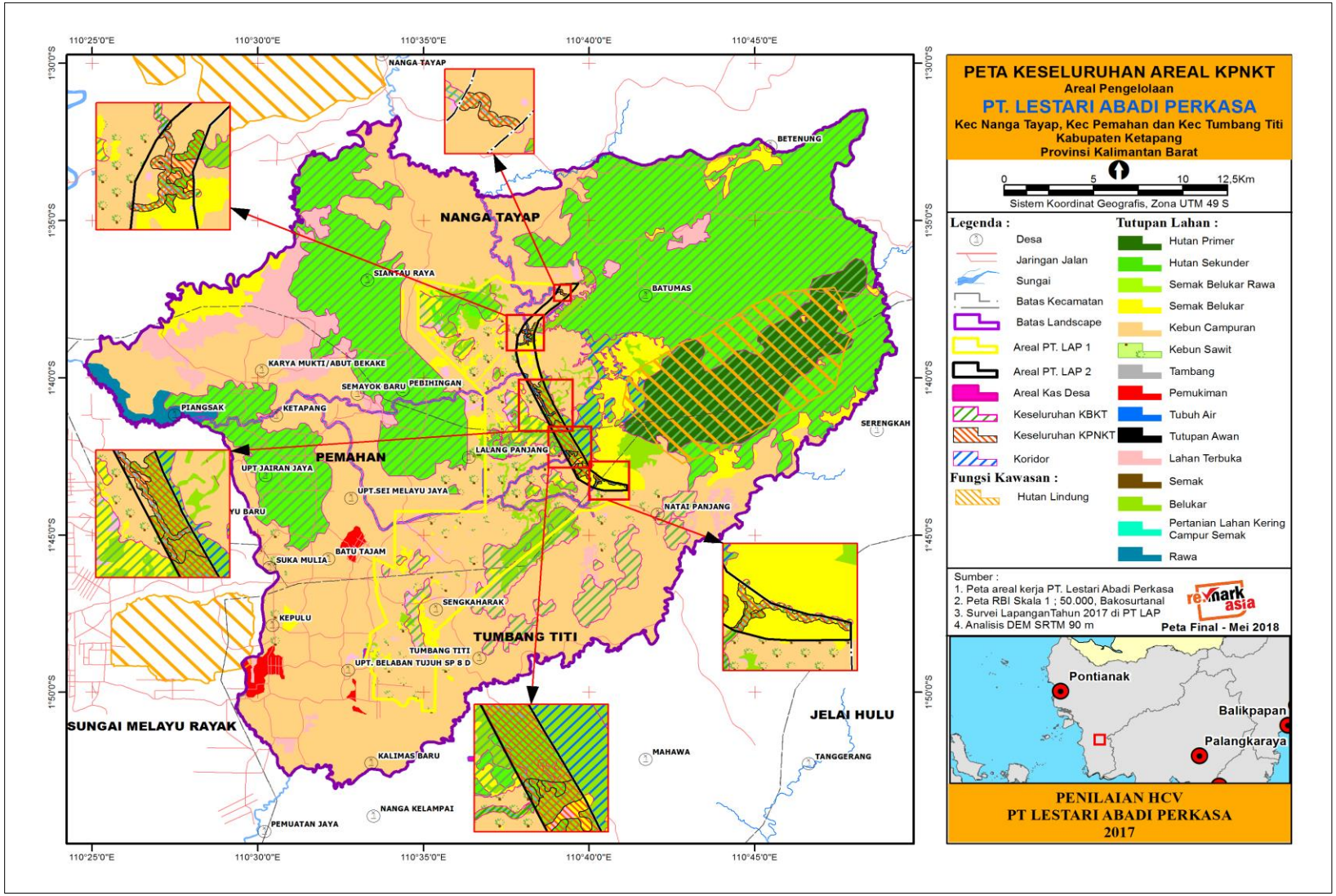

Figure 18. HCVMA map

3.2.5 Village development palm oil

The Village Development Palm Oil is one of the concerns of PT LAP in capturing the inspiration of rural communities around the company to contribute to efforts to help improve the economy and development of rural communities. The construction of the Village Farm is a proposal by the village community to the management of PT LAP to build a village-owned oil palm farm whose results will be used for the benefit of village development. The location and information on the planned development of the Village Farm which are outside the permits of PT LAP 1 and PT LAP 2 but side by side / adjacent to the licensing limit. Complete information on the plan for the Village Farm is presented in Figure 19 and the following table.

Table 7. Village development palm oil

Village Farm	Location	Previous Landowner	Ha
Tumbang Titi Sub-district			
Desa Batu Tajam	Dusun Batu Betungkat, Desa Batu Tajam	Bapak Seroja	7.4 Ha
Desa Sepuring Indah	Dusun Kute Belian, Desa Titi Baru	Bapak Gregorius	7,0 Ha
Desa Tanjung Beulang*	-	-	-
Nanga Tayap Sub-district			
Desa Batu Mas	Dusun Batu Brani, Desa Batu Mas	Bapak Edi, Bapak Tibor dan Bapak Boromeus Ardian	7,0 Ha
Desa Cegolak	Desa Betenung	Bapak Thomas Ayo, Bapak Leonardo, Ibu Ino dan Bapak Matius Nadum	7,0 Ha
Desa Betenung	Desa Betenung	Bapak Donatus Alung, Bapak Mrkus Rusli, Bapak Lasim dan Bapak Hadi	7,0 Ha
Pemahan Sub-district			
Desa Pebihingan	Desa Pebihingan dan Batu Mas	Bapak Haji Ajudan, Ibu Yulita dan Bapal L. Hamdan	7,0 Ha
Desa Kerta Baru	Desa Batu Mas dan Desa Perbihingan	Ibu Miris, Bapak Bagong dan Bapak Sonda	7,0 Ha
Total of Village Farm:			**49.4 Ha**

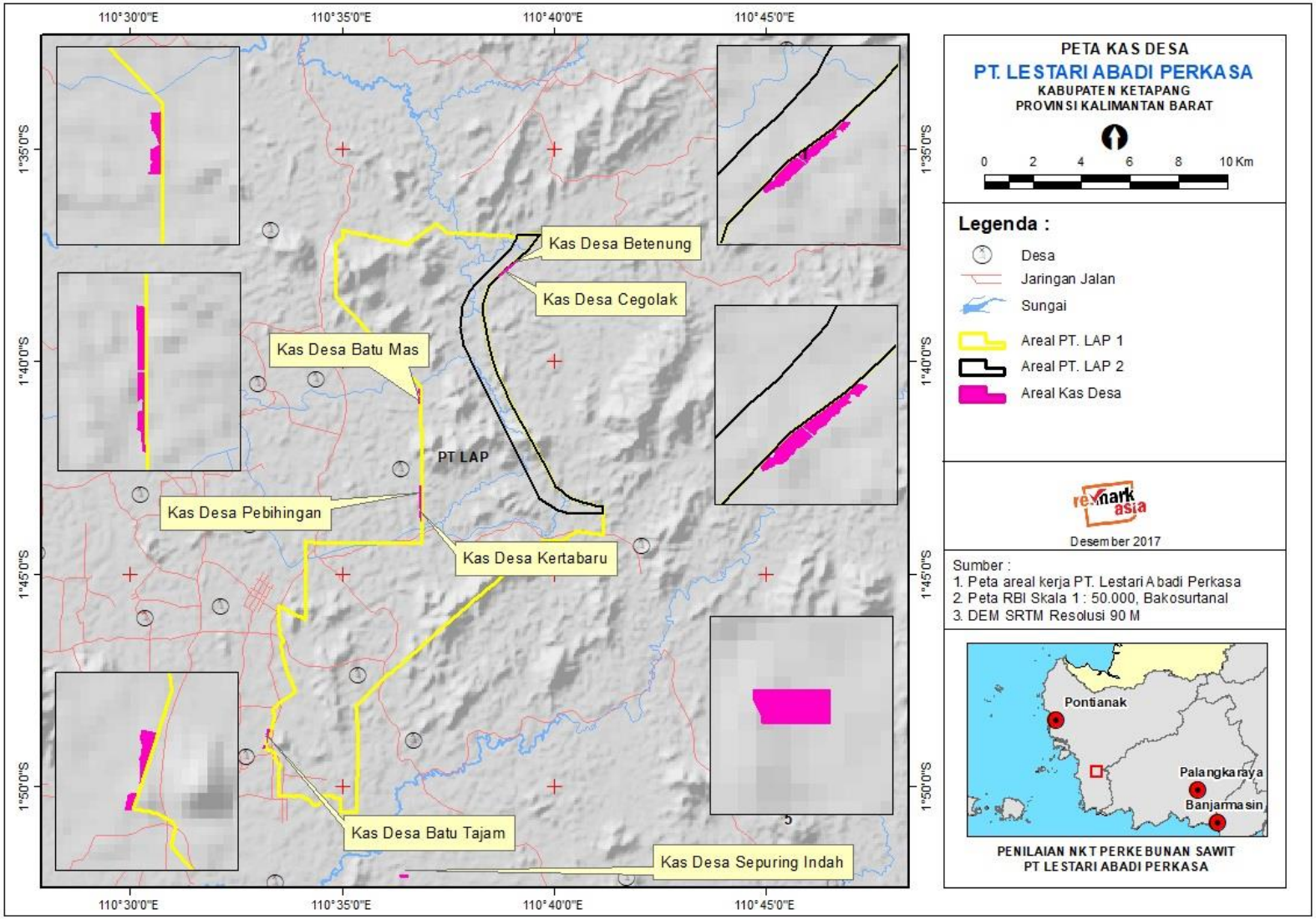

Figure 19. Map of Village development palm oil, outside of PT LAP permit area

During the process of building a Village development palm oil plan, PT LAP has conducted several meetings with the 'Team Desa' and provided guidance on determining the Village Farm plan, including: (1) Village Farm located around and adjacent to the PT LAP Plantation to facilitate transportation access, (2) Previous landowners understood and knew that the sale of land was intended for the development of village farm and were free from disputes, (3) Village Farm should be compact in one stretch of land and not crossed by rivers or springs and have relatively flat slope so that the area of the farm is effective (4) Village Farm are abandoned / passively productive land that is not managed and there is no forest area or important place that has natural resources that are still used by the community (related to HCV areas) such as springs, 'Pedahasan' belonging to the community, village or family or the sacred place that is still respected by the community and (5) Willing to go through a further process carried out by the company before it is decided to be able to be purchased. One of them is assisting the village in obtaining recommendations from the Forestry Department regarding the status of the land.

The results of the analysis of the seven village farm plans, based on the status of the forest region, are outside the map of the area and outside the indicative map of the moratorium of new licenses (PIPPIB) revised XI. The seven village farm plans are also located outside the Map of Endemic Bird Area (EBA), Map of Important Bird Areas (IBA), Map of the Heart of Borneo (HoB), Map of Intact Forest Landscape (IFL) and Map of Borneo orangutan's distribution.

3.2.6 Stakeholder consultation

Consultation with stakeholders is carried out at all stages of HCV identification, starting from preparation / pre-assessment, during identification in the field, and the process of preparing reports. Consultation is carried out with two approaches, namely interviews and formal meetings (presentations and discussions). Stakeholders are grouped based on their relationships and interests in the Identification area and the object under study. This group is divided into four, namely local / local communities, organizations and institutions representing local communities and district level government institutions.

For the identification of biodiversity HCVs (HCV 1-3), local communities are consulted about the history of local natural resource use, current presence and locations of RTE species, and threats that occur.

Identification Aspects HCV 4 which is consulted with local communities are important environmental services that are directly utilized by the community and the history of land resource utilization. Local authorities / authorities are consulted on regulations related to the protection and management of environmental services.

In the identification of HCV 5-6, consultation with local communities is absolutely necessary. The consultation covers the history of land use, fulfillment of basic needs and sources of livelihood; origin,

variety of local culture, sacred / religious areas, traditional history related to natural resources and their uses; past and present status, and future management plans. The stakeholder group and consultation approach are presented in the following table.

Table 8. Stakeholder group and consultation approach

Stakeholder	Method
Local communities as beneficiaries of ecosystem services or products include: fish seekers and river users flowing in HCV identification areas	Interview during the field survey. Presentation of results and discussions at formal meetings.
Local community representative institutions, namely: Village Government and Sub-District Government (3 sub-districts), Traditional institution of Dayak Pesaguan, Dayak Gerunggang, Dayak Kayong and Malay	Interview during the field survey. Presentation of implementation of Identification and provisional results, followed by discussions at formal meetings.
Relevant government office agencies, namely: Environmental Office Agency, Plantation Office Agency and Forestry Office Agency	Interviews and discussion of temporary results, followed by discussions at formal meetings

Public Consultation on HCV assessment results | The interim findings in the field at the time of the assessment have been consulted and published with relevant stakeholders on March 3, 2017 to request feedback and suggestions regarding the results of the HCV assessment and the preparation of HCV management and monitoring plans.

First Public Consultation was carried out on Tuesday, March 3, 2017, around 09:00 - 12.00, place in the meeting room of PT LAP's plantation office in Tumbang Titi District, Ketapang which was attended by 21 participants representing sub-districts, villages / village staff, BPD, Customs, community leaders and company staff. In this activity, the map displayed is still in draft form.

On December 13, 2017, the Asia Remark Team held a second public consultation Wednesday, December 13, 2017, around 09:00 - 13:00, place in PT LAP office hall, Tumbang Titi, Ketapang attended by 32 deputy participants from government agencies, sub-districts, villages/village staff, BPD, Customs, community leaders and company staff to deliver final results of HCV assessments and HCV management and monitoring plans at PT LAP 2 and Village Farm. In the second public consultation activity, the map displayed is still in draft form, this is because, there is a possibility that the team will get new information that has not been obtained during the field survey. Some important notes from public consultation activities are summarized as follows:

Company interaction with local communities in HCV identification areas

- The company has frequently communicated the oil palm plantation establishment plan with the local communities since they received the first permit area in 2011. Until 2013, slowly but sure, the communities have given positive responses and their trust regarding the company's plan of land clearance.
- The company commits to provide land compensation. SOP of land compensation mechanism is available, formulated in accordance to legality and transparent certification standard, involving the villages and communities.
- Company interactions with villages and communities have been regularly taken place, where relations were developed and the company regularly socialized their programs for evaluation.
- The company has allocated CSR support that is in line with community's needs based on internal assessment.
- Due to the increase of trust to the company, some villages have already been initiating the development of village plantation—a kind of *plasma* plantation owned by the village itself.
- The new permit area is located adjacent with the first permit area, having similar four villages in the surrounding area.

Community interaction with the new permit area of PT LAP

- Claim and land ownership. The local people, mostly possess their own land, or family land, obtained by opening forested areas, or inherited by the previous family member/ancestor decades ago. Some of them are located on the location of the new permit area of PT LAP. Each family has, at least, 3 ha of land at different locations. There were even families that own 20 ha areas on different locations.
- Land and natural resources utilization.
    - Farming. Based on interview with the communities, it is stated that converting forest areas into farming areas is a common practice and has been implemented since long time ago. It is related to the local communities' livelihood, the sifting agriculture of Dayak people.
    - Illegal Logging. With the rotation cultivation system, the piece of land that has been fallowed (often has become a forested area) need to be re-opened when the farmers are back to their previous field.

- Illegal gold-mining. The increase of gold mining was found around river basin and riverbanks in the new permit area, before being prohibited by the government. Gold-mining activity using crate with suction machine cause damage to the rivers and decrease the quality of river water. This activity was done by people from and around the village.

- Wild animal hunting. Almost all wildlife was hunted for food. This activity was done for ages as a part of tradition and hobby. Wildlife hunting was carried out by making traps and using guns. Some of these traps still can be found at certain locations.

- Water resources. The communities get clean water mostly from drilled well, boreholes, and spring, although some local people still use river water for bathing, washing and toilet. During dry season, when the groundwater level decreases, the people are using river water as complimentary.

- Forest utilization for custom needs. Based on interviews and consultations with the communities, it was known that there is no customary forest on the additional new permit area of PT. LAP. Field observations showed that the land covers consist of secondary forest and ex-rubber plantation that already covered with shrubs and bamboo.

Decision-making process

In the decision-making process, the village governments make decision by involving informal customary institution on the village level. Custom leaders give recommendations to village leader. Community representatives normally comprise heads of *RT*, *Badan Perwakilan Desa* (Village Representative Agency), school teachers, and head master or government officers who are well-educated.

Tendency on Social Change

Social change occurred in social structure and function such as geographical condition, material culture, compositions of inhabitants, cultural tradition and ideology that could change the economy and politics situation. Observable social change occurred in the society influencing its social system; such as values, attitude, and behavioral patterns among groups in the society. Geographical condition change also happened because of land-clearing, resulting in the shift of land utilization pattern. Road infrastructure and village facility developments also affecting the social community change, due to the ease of community access to economic resources. Economic changes have been felt by the community since the company's activities were running, the community got a picture of the availability of stable income from yields as employees of the company compared to selling rubber latex whose prices are uncertain and tend to be very low. The existence and relationship with the company is highly expected by the community.

Village Oil Palm Farm

The community guarantees that there is no HCV potential in the village farm because the location is a former field. This is supported by a permit from the West Kalimantan Forest Service Office that has verified being in APL locations and does not overlap with other forest region or the Indicative Map Determination of Moratorium the New Permits / PIPPIB (moratorium on primary natural forests and peatlands)

Menuba (Traditional Ritual)

The traditional rituals of 'Menuba' (poisonous activities) in the river are still being carried out, mainly on the Pemahan River. It used to be a prayer ritual to ask for rain, one of which was because the river water had not flowed and only existed in places that were rather deep as where the fish were and became a place for 'menuba' rituals'. The location is then arranged according to custom places that can be in the tub in turn so that the parent fish can still breed. Current conditions, rituals only exist in Pebihinggan Village, and are carried out illegally without permission and damage the environment because inorganic poison are used. To come should be prohibited.

Table 9. Summary of concerns rose during stakeholder consultation

No	Date	Name | Position/Role | Organization/ social group	General concern / recommendation
1	28th Feb 2017	Alipius, SE | Head of Village | Tumbang Titi Sub-District	a. Alipius share about the diversity of Dayaks Tribes in the villages and sub-districts of Tumbang Titi, namely Dayak Serengkah Pesaguan, Dayak Ketumbuan Tiga, Dayak Belaban Lima and Dayak Jelay Kedawangan.
			b. Dayak Serengkah Pesaguan originally came from the "Rumah Panjang Pelimbang Jalur" which later developed into "Rumah Panjang Bintang Timur".
			c. The main local communities' livelihood in the Tumbang Titi Sub-district is tapping rubber for cash to buy daily needs, rice that planted only once a year and there are also those that raise livestock, traders, honorary teachers and PNS.
			d. There are still protected trees in the Tumbang Titi area, namely Honey /Lalau and Tengkawang trees.

No	Date	Name | Position/Role | Organization/ social group	General concern / recommendation
			e. For customary graves there are 2 kinds of graves, namely "Sandung" and "Tambak". Sandung is a grave in the form of a house with dragon decoration on the roof, supported by a pole and usually placed in the front of the house. Sandung is build for high castes such as the descendants of the King, "Demang" (traditional leader) and respected elders in the village. Where Tambak is a grave placed on the ground without any decoration and is build for low caste or commoners.
			f. Tumbang Titi subdistrict is divided into several villages, namely: • Beringin Rayo Village, Tanjung Beulang Village, Serengkah Village, Serengkah Kanan Village, Batu Beransah Village, Tanjung Maloy Village or also called Serengkah Lima or Dayak Serengkah Pesaguan sub-ethnic. • Suka Damai Village, Natai Panjang Village and Fisherman Village, Dayak Ketumbuan Tiga sub-group. • Aur Gading Village, Marau Sinar Bulan / Sepurung Indah Village, Batu Tajam Village, Pengetapan Village, Malay Village, Dayak Belaban Lima ethnic group. • Jungkal Village, Nanga Kelampay Village, Mahawa Village, Petebang Jaya Village, Kekurak Village, Sepahuan Raya Village, Dayak Javanese Fishermen sub-group Kendawangan.
			g. For the health sector in each village there are only small clinics located in Serengkah Village. Puskesmas is available in Sub-district. For the education sector, there are preschool, kindergarten, elementary school, junior high school are available in every village. As for senior high school and college are available in the center of the Tumbang Titi District.
			h. The village of Tanjung Beulang is a new village that has been growing for 5 years.
2	1 Mar 2017	Christ of Muchsin | Head of Hamlet| Sungai Kerta Hamlet of Batu Mas Village	a. Batu Mas Village consists of 4 hamlets, namely Kampung Baru Hamlet, Batu Bonang Hamlet, Sei Kerta Hamlet and Batu Berani Hamlet.

No	Date	Name | Position/Role | Organization/ social group	General concern / recommendation
			b. The negative impact of the PT LAP Oil Palm Plantation is that there are company employees who washed the used pesticides and fertilizers container in the river and affect the river in Batu Mas Village. The clarification has made by Mr. Siswondo as a representative of PT LAP. He explained that the container was empty and the employee is collecting water from the river, not to rinse the pesticides and fertilizers.
3	1 Mar 2017	Boromeus | Villager | Batu Berani Hamlet of Batu Mas Village	a. Positive Impact is felt by the availability of PT LAP's CSR for Batu Mas Village. PT LAP is providing assistance in the form of scholarships, assistance with water pumps and purifier tubes in 2 Hamlets namely; Kampung Baru Hamlets and Batu Berani Hamlets, assistance in repairing road construction and other social assistance that greatly helped communities in Batu Mas Village.
4	1 Mar 2017	M. Sumitro | Head of Development Affairs | Batu Mas Village	a. Water problems have been fixed by the PDAM, but the other problem that occurs is the electricity from PLN often to cut off. This is a problem that occurred in Batu Mas Village.
			b. The pipe of the purifier tubes given by PT LAP to provide clean water for the local communities are stolen by irresponsible people, so that clean water is not used optimally.
			c. For the health sector, there are clinics and Puskesmas and 1 midwife but the medical tools and medicines are also limited, so please help to facilitate that shortcomings.
			d. The SD and SMP are available in Batu Mas Village, SMA it is available in the center of Nanga Tayap Sub-District and SMK is available in Pemahan Sub-district.
			e. The Dayaks in Batu Mas village is Dayak Gerunggang from “Rumah Panjang Tanjung Suka” that previously known as “Rumah Panjang Pulau Juante”. Dayaks in Batu Mas Village originally came from the PT BGA permit area.
			f. The rivers bordering Batu Mas Village are the Senyukun River, Semangkoyan River, Gerunggang River and Sempunuk River.
			g. The majority of Gerunggang Dayak religions in Batu Mas Village are Catholic and Buddhist.

No	Date	Name | Position/Role | Organization/ social group	General concern / recommendation
5	1 Mar 2017	Simor | Traditional leader | Sungai Kerta hamlet, Batu Mas Village D. Narripin | Traditional leader | Desa Batu Village	a. For the opening ceremony of the rice field area, the community of Batu Mas Village conducted a ritual ceremony, namely Panta sangka, Tebas, Tebang, Bakar, Tunggal, Nyansang lakau (eating cucumber), Ngebaru (young rice), Tentebus (Feast after Harvest). The clearing is starting from May to June.
			b. Customs for the deceased, namely: Day 1 bathing the corpse ritual, moving the corpse to the chest, preparing the traditional offerings, Day 2: The Mengganjang ceremony, returned home, buried, Ulay ketabay and lastly the bones are inserted into the Sandung put in on the pole.
			c. There are two kinds of customary graves: “Sandung” and “Tambak”. “Sandung” is a place to store bones in a small house with poles that have dragon decorations on the roof and are usually placed in the front of the house. “Sandung” is build for the descendants of the King, “Demang” and respected elders. Where “Tambak” is a grave placed on the ground without any decoration and is build for low caste or commoners. “Sandung” and “Tambak” can be found outside the concession of PT LAP.
6	1 Mar 2017	Florensius Ahai | Village Secretary | Batu Mas Village	a. The majority of the community's main livelihoods are rubber tapping as for rice fields, it is only done once a year. Besides, there also oil palm plantation business.
			b. Plasma in the sub-district namely, Kopersi 8 Pilar Maju Bersama (1 plasma for every Sub-district, which is Nanga Tayap Sub-districts, Pemahan District and Tumbang Titi District). The other one is Koperasi Tani Sekorun Mandiri established in December 2015.
			c. The plasma is mutually owned plantation, so the land ownership is belong to the organization.
			d. Every hamlet in Batu Mas Village has a Demang (traditional leader) whose job is to manage all the problems that exist in the village, the customary system in the village of Batu Mas is still thick. And there is also a village traditional council.
			e. The source of community clean water is from PT LAP’s CSR program, from artesian wells and conventional well.

No	Date	Name | Position/Role | Organization/ social group	General concern / recommendation
			f. Facilities and infrastructure for sports activities do not yet exist, for this reason the community asks for the assistance of PTLAP to create a sports field for the youth.
7	1 Mar 2017	Fransiskus Mardan | Public figure | Batu Monang Hamlet of Batu Mas Village	a. PT LAP is always present in traditional village events.
			b. There is designated implementing unit (Satlak) as a mediator between the community and the company.
			c. PT LAP has provide assistance in the form of building materials to build house of worship.
			d. PT LAP provided land for traditional houses in the Batu Mas Village.
			e. PT LAP has provide assistance to bring fresh water for 2 hamlet.
8	1 Mar 2017	Markus Junaidi | Head of Village| Cegolak Village	a. There is a custom stamp in Cegolak Village, it is called "Siding Buluh"
			b. The traditional house that located in Cegolak Village is "Rumah Panjang Kampung Batu". The traditional house is also known as "Gelombang Danau" house.
			c. Dayaks in this village are came from sub ethnic Dayak Gerunggang.
			d. Cegolak village is a newly formed village consisting only of 2 Hamlets, namely Selupuk and Tanjung Bayor Hamlet.
			e. The majority livelihood of the local community is rubber tapping. The average area of rubber plantation is around 5-7 ha. In average, one family can produce 20kg of rubber latex each day.
			f. The majority of the population are members of the CU (Central Union) the main livelihood come from rice fields, rubber, plasma oil palm, traders, honorary teachers, and PNS.
			g. For infrastructure facilities, there are kindergartens and elementary schools, Catholic churches, mosques and temples.
			h. For the electricity source, PLN has entered the village.
			i. There are only Posyandu for health facilities.

No	Date	Name | Position/Role | Organization/ social group	General concern / recommendation
9	1 Mar 2017	Petrus Mansan.S | LPM | Cegolak Village	a. The source of clean water for people in Cegolak Village named "Laman Batu Gading" is transferred through a pipe directed to Selupuk and Tanjung Bayor Hamlets.
			b. Outside the concession of PT LAP's, there is a sacred tomb, called "Makam Keramat Cegolak Tua". This is the sacred tomb that overgrown by Ibul trees. Around this areas, there are also found many old tomb, old Sandung and some weathered wood.
			c. There are some people who cook using firewood and some use 3 KG LPG gas at a price of around Rp. 25,000 - Rp. 30,000 / tube.
10	1 Mar 2017	Bensuria | Head of welfare affairs | Cegolak Village	a. There are people in Cegolak Village areas who start developing fish ponds and pig farms.
			b. For the livelihoods of the farmers, the communities are still carrying it out using traditional method of shifting cultivation, especially when their fields are no longer fertile. Besides, they also plant vegetables and fruits. The rice farmers usually plant their fields once a year. As for the daily needs, majority of the community rely to rubber tapping and there are also those who cultivate oil palm. They also have seasonal / annual income from selling seasonal fruits such as Durian, Kusik, Cempedak and Duku.
			c. The cultivation of rice is still using traditional tools such as Angi (rice cutting tools), Butong (a place for rice seeds), Penampi (for sorting the rice with the husk).
			d. Hunting activities in the forest are still carried out by Cegolak Villagers. They usually hunt Deer, Wild Boar and Pelanduk. They usually consume their own prey and part of it is sold.
11	1 Mar 2017	Lensiu | Public Figure | Cegolak Village	a. For Cegolak Village, there has been assistance for road repair by PT LAP.
			b. The price of fuel in this region range from Rp 10,000 to Rp12,000 / liter. It sold by retail traders.

No	Date	Name | Position/Role | Organization/ social group	General concern / recommendation
			c. To fulfill the need for building materials for poles and house structure the local community usually buys it from carpenter in the village. The price of wood varies, for Ulin wood it sold per pieces and for other woods, they usually sold per m^3.
			d. Information on the rarity of tombs in 'Pedestal' and community land and its existence is still respected even though it is rarely even not visited or treated.
			e. Mr. Lensiu also share his experience of land compensation process conducted by PT LAP which has a very careful compensation mechanism, if there is a tomb, PT LAP will keep it.
12	1 Mar 2017	Diparta | Head of Hamlet | Betenung Village	a. The income of the Betenung Village community is come from the cultivation of lowland rice. The farming system is still using traditional approach by burning and then move to the other area. Beside rice, the community also plants other crops such as vegetables and fruit trees. Planting rice is actually done once a year. The main livelihood for the community is come from rubber tapping. The price or rubber latex in this location, is around 12,000 / kg and there are also people who trade and worked as PNS. The community rubber plantation is around 2-5 ha/person.
			b. To fulfill the needs of protein, there are those who catch fish in the river. The fish that usually caught are Seluang and Baung fish. The community usually fishing when it rains. Their catch is consumed by itself and sold.
			c. For bathing, washing and toilet there are some people who still use the river.
13	1 Mar 2017	Rusnadi | Village secretary | Betenung Village	a. Betenung village consists of Sekembar Hamlet, Sandung Tinggi Hamlet, Kayong Mekar Hamlet, The hamlet near the Demit River have the largest population in the village of Betenung compared to other villages.
			b. The majority of religions adhered to by the Catholic community, and are a sub-ethnic of Dayak Kayong or Dayak Melayu.
			c. In this village there are elementary school, junior high school, Pustu, Polindes and Posyandu.

No	Date	Name | Position/Role | Organization/ social group	General concern / recommendation
14	1 Mar 2017	P. Banding | Public figure | Betenung Village	a. Demit River's water and Seladan River's water quality has been polluted due to illegal mining activities.
			b. The government and companies need to pay attention to their environmental aspects so that in the activities in the plantation did not negatively affect the river quality.
			c. There are CSR program form PT LAP in the form of school equipment and fire fighter team in the village.
			d. The source of clean water of the local community comes from artesian wells, which flow from the mountain, distributed using pipes. There are 3 sources of springs,namely Pancur Kilang,Lanjau & Srajeun.
15	1 Mar 2017	Markus | Head of development affairs | Santikam Hamlet of Tanjung Berulang Village	a. Tanjung Berulang Village is a village part of the distribution area of the Dayak Pesaguan Hulu sub-ethnic which is predominantly Catholic. Based on informants' information, the majority of the population came from "Rumah Panjang Serangkah Pesaguan" which later developed into the "Rumah Panjang Jalur Pelimbang" and "Rumah Panjang Bintang Timur". Now this village has been developed into Beringin Rayo Village, Tanjung Berulang, Serengkah, Serengkah Kanan, Batu Beransah and Tanjung Maloi. Tanjung Berulang is a division from Serengkah Village in 2008.
			b. The traditional house for the Dayak Pesaguan sub ethnic group in Tanjung Beulang Village has the form of a large house not a long house.
			c. Although the majority of the Dayak are Catholic, they also have tribal traditions. For example, there are ritual ceremonies related to the cycle of cultivation (beginning and harvest) and the life cycle such as birth, marriage, and death. Dayak Sub-ethnic communities live as farmers with a slash-and-burn system and move if the soil fertility begins to decrease. In the fields of wetland and rubber fields, they are also planted with maize, cassava, vegetables, fruits, rattan wood and bamboo. The rice cultivation has not been intensively carried out by the community. The planting of rice is only done once a year. The majority of the people of Tanjung Beulang Village have land of 2-4 hectares. The crops are usually consumed by themselves.

No	Date	Name | Position/Role | Organization/ social group	General concern / recommendation
			d. The area of village / customary forest in this village is 1,750 ha bordering the Beringin Rayo Village, this forest is a protected forest that is managed and protected by the surrounding community, every month the community conducts monitoring in the forest area.
16	1 Mar 2017	Nikolaus | LPM | Batu Bulan Hamlet of Tanjung Berulang Village	a. The source of people's daily lives is come from rubber tapping. The rubber latex collected then delivered to the middleman. The process of rubber tapping is by incise or injure a large rubber tree to get the sap, then the rubber latex is collected into a rectangular box and then thickened by adding vinegar so that it becomes solid rubber and can be sold. This incising activity cannot be done every day, usually incised for 2 days and the third day must be stopped. This is done to maintain the water content, so in the fourth day the community can incised it again. This incising activity can only be done during the summer, if it is raining the community cannot do the activity. The income from rubber is very dependent on rainfall and labor. To increase income there are also some people who plant pepper, candlenut, and secondary crops such as corn, sweet potatoes, beans, coffee and there are also some people who plant fruits such as bananas, mangoes, jackfruit, papaya, and durian.
			b. There is also a community in Tanjung Beulang Village that raises cattle, such as Goats, Pigs and Chickens. Usually, the community raises cattle as a savings or investment and will sell it when there are buyers from outside the area. Meat produced from 4 villages includes, Wild Boar, Deer, Pelanduk and Ferret are consumed for daily needs. And for the needs of wood for building materials people take it from the community forest and there are also those who buy to the carpenter in the village. The price of wood for 8x8 sizes is Rp. 70,000-85,000, for Belian wood. Ulin wood can still be found in the community forest.
			c. In Tanjung Beulang Village, there are some people who farm swallow nests.

No	Date	Name | Position/Role | Organization/ social group	General concern / recommendation
17	1 Mar 2017	Lori | Ketua RT | Dusun Batu Bulan, Desa Tanjung Berulang	a. The majority of the people in the Tanjung Beulang Village buy their daily need to the peddlers and to the markets in center of the Tumbang Titi sub-district.
			b. For clothing material, the local community obtains it through purchasing.
			c. To fullfil the protein needs, for example fish, the local community also buys to peddlers who bring their goods to the hamlets. Whereas for fishing activities the community doing it just as a hobby and is not done as a main livelihood. The species of fish in the Tanjung Beulang Village has been decreased because many of them die from water pollution.
			d. There are only a handful of people who still utilize the river for Bathing, Washing and Toilet and also using it as a source for clean water.
18	1 Mar 2017	M. Novianus | Tokoh Mayarakat | Dusun Batu Bulan, Desa Tanjung Berulang	a. The existing spring in the Batu Mas Village is the Sungai Keropai spring which the downstream is located at the Semerengkas River.
			b. There is assistance from the Dutch government for dam development around the Sungai Keropai spring.
			c. Tembawang and Sandung were not found on the proposed development areas.

3.2.7 Threat assessment

The assessment of threats was undertaken to determine the priority in HCV management, by identifying the level of threats on HCV areas. The result will be used to define the most appropriate responses and actions against threats. The summary of HCV threat assessment is presented in the following table.

Table 10. The summary of HAV threat assessment

Current condition / pressure	Impact	Cause / Source (possible contribution to pressure)	Notes
HCV 1			
• "The small population of some RTE species is threatened and declining.	Medium	• Quality of habitat decreases due to illegal logging of plant species of high economic value and land clearing.	• The forested area in Bukit Lintar (Bukit Sekorun-Bukit Lambung - Bukit Lintar), the condition of the forest is still quite good and has high

Current condition / pressure	Impact	Cause / Source (possible contribution to pressure)	Notes
• "Places such as commensurate rivers protected by degraded laws.		• Loss of wildlife corridors (river borders) or fragmentation of wildlife habitat due to logging and land clearing. • Hunting for several important types of wildlife by the community.	biodiversity potential. The forested area has been reserved by the company as an area for conservation. • Still found logging of plant species of economic value by people from outside. • Boundary as an animal corridor in the future has great pressure due to the management of land for cultivation.
HCV 2			
Reduction in forested area, especially in areas that become corridors of wildlife movements	Medium	• Loss of wildlife corridors (river borders) or fragmentation of wildlife habitat due to logging and land clearing both inside and in the area within the boundary of PT LAP 2's operational assessment.	• Forested area in Bukit Lintar (Bukit Sekorun-Bukit Lambung-Bukit Lintar), the condition of the forest is still quite good and has high biodiversity potential. The forested area has been reserved by the company as an area for conservation. • Still found logging of plant species of economic value by people from outside. • Boundary as an animal corridor in the future has great pressure due to the management of land for cultivation.
HCV 3			
Reduced forest area, especially the Bukit Lintar forest area (threatened ecosystem)	Medium	• Logging of remaining forested areas.	Still found logging of plant species of economic value by the community.

Current condition / pressure	Impact	Cause / Source (possible contribution to pressure)	Notes
HCV 4			
Extreme water flow events	Medium	• Community gardens are located on the border of a river that has not been managed properly • Access to HCV areas that are increasingly open after the construction of gardens	Of all rivers, access to the border area is sufficiently available, both through garden roads and from rivers
Maintenance of downstream river flow regimes	Medium	• Logging activities carried out by the community • Use of river border areas that are mostly in the form of community gardens	The vegetation in the border of the river is less able to minimize the impact or serves as a filter for land erosion and river cliff reinforcement
Decreasing water quality	Medium	• The results of land erosion and residues from the use of fertilizers, pesticides and herbicides carried by surface runoff • Morfoerosi river cliffs	Most of the river borders of poor communities are filters for pollutants as well as reinforcing river cliffs
	High	• Use of chemical poisons in the river during custom Menuba rituals during the long dry season	The river is still used during the long dry season as an alternative to clean water. The ritual is considered to endanger the river and the community
Protection of soil or aquifers	Medium - High	• Community gardens are located on the border of a river that has not been managed properly • There is an open land area due to the activity of land burning and logging	The company has a protection commitment for protected areas in river banks and steep slope areas
The area of the hill decreases or the quality decreases	Medium – high	• Logging activities carried out by the community • Forest and land fires	The company has a land development master plan that has reserved steep slopes

Current condition / pressure	Impact	Cause / Source (possible contribution to pressure)	Notes
HCV 5			
Deviation of water quality and quantity in high rain and dry times	medium	• Reduce and damage water catchment areas that cause runoff directly to river flow with erotion. • Community garden on the riparian zone has not managed and has not able to be a buffer yet • Illegal logging and bad land management in catchment area and riparian zone include explotation gold in riparian zone. • Garbage and household waste also clog up river flow and run out river flow	• All riparian zones can be accessed and available by the road or river. • Vegetation on riparian zone still not able to minimize or be a land erosion filter and riparian amplifier. • The high erosion decrese water quality and low catchment decrease water quantity in dry season.
HCV 6			
'Pedahasan' and fields that have potential / indications of an old tomb will be asked for compensation	Low	• The amount of land ownership of each family that cannot be learned from the ancestors' inheritance when the cultivation system is still being carried out • The desire to get compensation for intensive cultivation costs on other land	Almost every family has at least 3 plots of land which are sometimes far apart and not well managed. The development of access and the local economy has triggered the development of new businesses including promising oil palm cultivation.
There is still a 'Menuba Ritual' which uses chemical poisons	Low	• Only done by some residents of Pebihingan Village on the Pemahan River, which is now opposed by most residents	Rituals have been deemed deviating from the original tradition because they use chemical poisons that are harmful to other citizens

Threat assessment result shows that, the HCV areas face various threats in general, mainly because the easy access to the forests. The existing of important values and their main threats are presented in following tables:

Table 11. Existing of Important Values in Identified Area

HCV	Summary of important value in identified area	Main threat
1	• Small population of several RTE species in forest habitat on Bukit Lintar in the PT LAP 2 location permit area • Degradation of important places protected by law	• The killing of important species of wildlife such as gibbons, bears, anteater, and hornbills due to hunting of these wildlife. • Decreasing and loss of quality of habitat and important places protected by law (commensurate with rivers) as wildlife habitat, especially for those who need tree canopies such as gibbons, eagles and hornbills and loss of important plant species due to logging or land clearing for farming.
2	The existence of a corridor is in the form of secondary forest and river border	• Logging of forested areas • Fragmentation in forested areas and river borders which cut off the movement of animals (corridors) both inside and in the area within the boundary of PT LAP 2's operational assessment
3	Reduced forested area in the Bukit Lintar forest area	Logging of remaining wooded areas
4	Management of extreme water flow events, including vegetated buffer zones or flooded land	• Sedimentation due to soil erosion which can reduce the flow capacity • Conversion of land in river boundaries will reduce the stability of riverbanks so that morphoerosi occurs
	Maintenance of water quality characteristics	• High surface runoff potentially results in erosion, fertilizers and pesticides leading to the river flow • Morfoerosi river cliffs • Conversion of land in the river border so that it reduces the border function as a pollutant filter • Rituals that use chemical poisons during long dry seasons that endanger river biota and other village communities
	Supply of clean water, and vulnerable fisheries	
	Natural ecosystems play an important role in stabilizing steep slopes	• Logging in hilly areas can cause reduced water absorption functions and increase the potential for surface runoff and soil erosion • The boundaries and marks of HCV areas are unclear so that there is the potential for over-clearing by LC contractors.
	Maintenance of down-stream river flow regimes	
	Protection of land or aquifers	
5	• The abundance of water during the rainy season with low quality due to	• Illegal logging and poor land management in water catchment areas, such as terraces in hilly areas. • Destructive gold search crates are commensurate with

HCV	Summary of important value in identified area	Main threat
	damage to the equivalent function as a filter and stabilizer. • Lack of quantity of water discharge in the dry season due to damage and poor land management in recharge areas.	injection water which destroys commensurate river functions and decreases river water quality • Waste and household waste reduce water quality.
	The tradition of fishing with menuba which now uses organic poisons	• Decreasing river water quality and the dangers of poisoning for animals, fish and humans
6	• There is potential / indication of the old tomb in 'pedahasan' and fields in the PT LAP 2 permit location • There are still 'Ritual Menuba', by residents of Perbihingan Village on the Pemahan River	• Pressure for compensation for important areas due to economic interests without thinking about the potential / indications of the old tombs in the 'pedestal' and their fields, later when displaced land clearing will become a potential conflict. • Traditions that are misused by some people

3.2.8 Inaguration of HCV, Awareness and Capacity Building

Inauguration of HCV areas by: (a) HCV areas map delineation, (b) verifying the delineation result and (c) determining the final result in a form of HCV area map. The company must document these processes in a report. The next step is HCV border and sign board installation.

- Conduct proper and effective socialization for: (a) company internal officer (field officer, other staff, such as contractors), (b) communities (land users, village governments, customary institutions, etc.), (c) related institutions or consultants.
- Arrange HCV Management Plan and Monitoring Plan, by considering: (a) species protection aspects, such as animal (orangutan) and human conflict management, (b) Establish corridor between fragmented habitat, and (c) orangutan habitat's enrichment,
- Strengthen the communication with the surrounding companies to develop HCV management plan and protection action plan.

- Involve local communities in every activity, because the importance and benefit of HCV existence are for everyone.
- Build an HCV management institution: (a) building a management unit to ensure the achievement of management goals and (b) training and recruiting staff with qualifications needed for HCV management.
- Capacity strengthening in HCV management identification, monitoring and evaluation: (a) Monitoring training, i.e. basic animal identification, water-quality measuring, stakeholder engagement and (b) implementing company's procedures and policies.

3.3 Soil and topography survey

3.3.1 Land system

The land system in the proposed development areas consists of 3 land systems which are dominated by the Pakalunai Land System (PLN) with a description of being at an altitude of 50-800 m above sea level, granite, schist, andesite, basalt, grandiorite, with an area of 793.14 ha or around 69.53%. The second domination is Honja (HJA) Land System with descriptions located at an altitude of 20 - 120 m above sea level, hilly land type, igneous rock, and undulating terrain. The type of granite, granodiorite, schist, andesite, basalt with an area of 199.37 ha or about 17.48% and the third is Bukit Pandan Land System (BPD) with description is a steeply oriented metamorphic mountain ridge with slopes> 60% and relief 300 m, ridge width <50 m without a valley, with an area of 148.14 ha or around 12.99%.

3.3.2 Soil type

Type of Land based on USDA Soil Taxonomy 1984 in the proposed development areas consisting of 3 types of land associations dominated by Tropudults; Dystropepts; with an area of 808.44 ha or around 70.88%. Second with 'Tropudults; Paleudults; with an area of 178.97 Ha or around 15.69% and 'Dystropepts; tropudults; Paleudults' with an area of 153.23 ha or around 13.43%. (see: Land Systems and Types of Soil Associations, USDA 1982 in Table 12).

Table 12. Land system and association type based on the 1982 USDA in the proposed development areas

Symbol / Land system	Description		Size (Ha)	(%)
	General description / Lithology	Soil assossiation type		
PLN Pakalunai	*Granite schist andesite basalt granodiorite*	*Dystropepts; Tropudults; Haplorthox*	793	69.5
HJA Honja	*Andesite, basalt, granodiorite; schist; granite*	*Tropudults, Paleudults, Tropohumults*	199	17.5
BPD Bukit Pandan	*Gneiss phyllite quartsize; schist andesite basalt*	*Dystropepts; Tropudults; Paleudults*	148	13.0
		Total (Ha)	**1.140**	**100.0**

The type of land is based on Dudal and Supraptohardjo from the Bogor Soil Research Center Classification System, 1981, in the proposed development areas there are 3 types of land associations which are dominated by Granite, Granodiorite, Skis, Andesite, Basalt and Gneis soil types, Filit, Quartzite, Skis, Andesite, Basalt which are fully presented in **Table 13**.

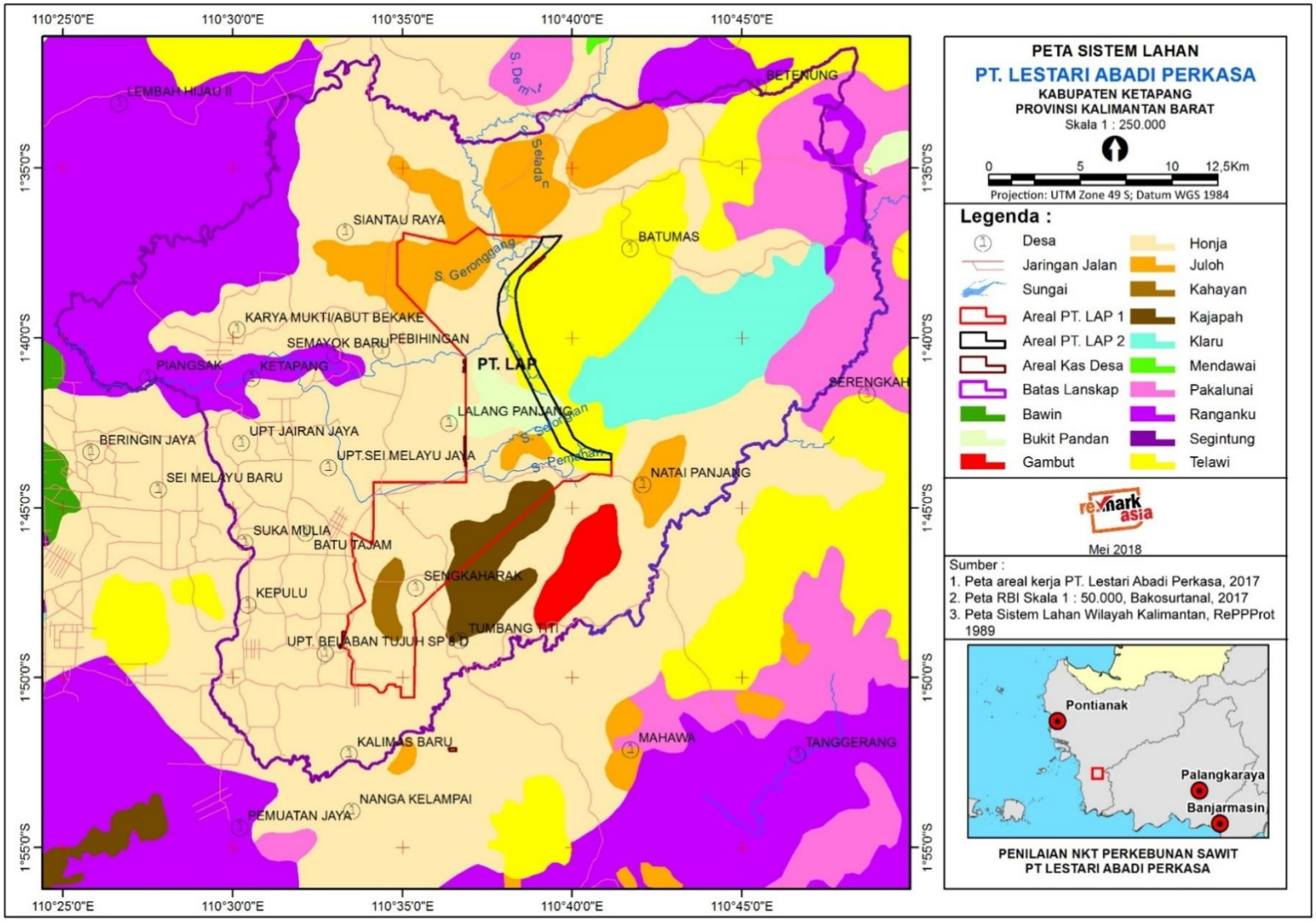

Figure 20. Land system map of the proposed development area

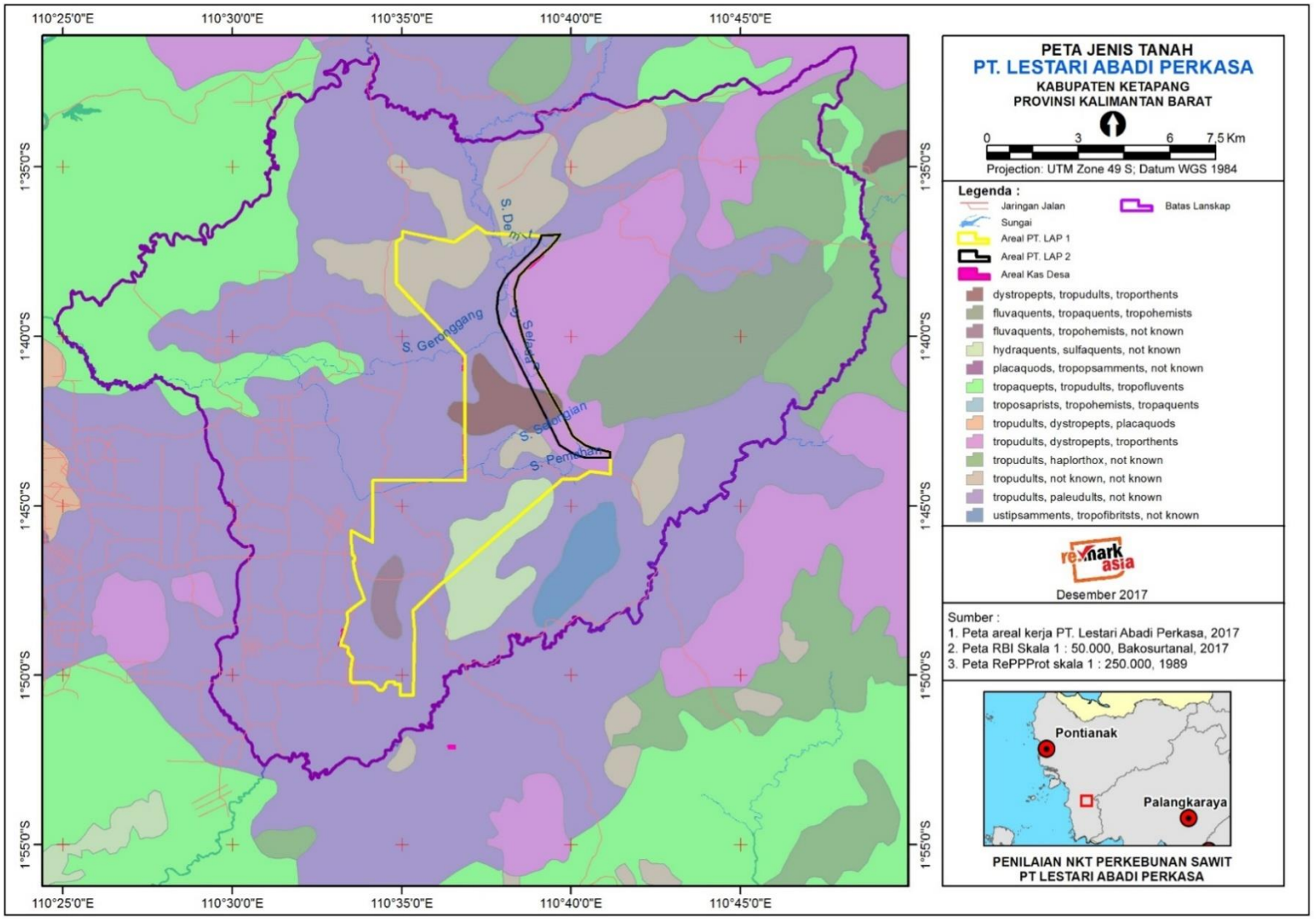

Figure 21. Soil type map of the proposed development areas

Table 13. Soil type in the proposed development areas

No	Soil type	Size (ha)	(%)
1	Granit	808	70.9
2	Granit, Granodiorit, skis, andesit, basalt	179	15.7
3	Gneis, filit, quartzit, skis, andesit, basalt	153	13.4
	Grand Total (Ha)	**1,140**	**100.0**

From the results of the study it was known that there was no peatland, no sandy land and no acid sulphate soil at the proposed development areas.

3.3.3 Topography and Elevation

Based on the SRTM Digital Elevation Model (DEM) Image with a spatial resolution of 90 meters, the topography of the proposed development areas are between 25 - 200 masl. While the slope class found in the proposed development areas are generally only a slope class 0 - 8% (Flat). Slopes above 40% (steep) are only found on the Sekorun hill. The slope class is presented in **Table 14** The map of the slope class in the proposed development areas are shown in **Figure 22**.

Table 14. Slope level in the proposed development areas

No	Slope	Size (Ha)	(%)
1	Slope 0 – 8%	837	73,9
2	Slope 8 – 15%	103	9,1
3	Slope 15 – 25%	64	5,6
4	Slope 25 – 40%	70	6,2
5	Slope > 40%	66	5,8
	Grand Total (Ha)	**1.140**	**100,0**

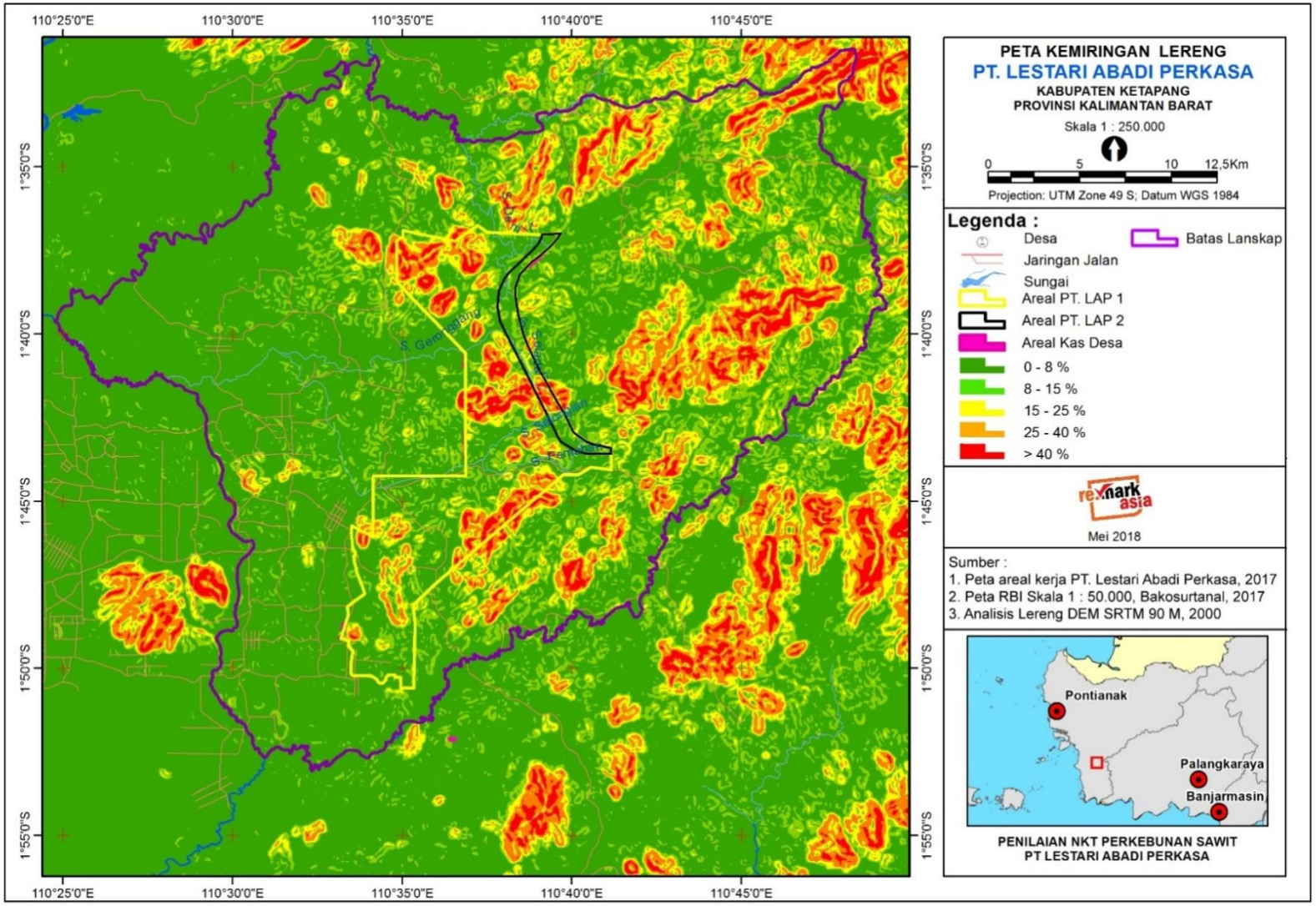

Figure 22. Topography map of the proposed development areas

3.4 High carbon stock assessment

3.4.1 Area of interest

The high carbon stock assessment was carried out in all PT LAP concessions, which included the first location permit with an area of ± 12,830 ha (location 1), the second location permit with an area of 1,140 ha (location 2) and an area of approximately 1 km from the concession boundary of PT LAP 1 and 2 where the 5 out 6 Kas Desa are located. The five planned Kas Desa are located in (a) Batu Mas Village, (b) Betenung Village and (c) Cegolak Village which is included in Nanga Tayap District and (d) Pebihingan Village and (e) Kerta Baru Village which included in the Pemahan District. The HCS of Kas Desa Sepuring Indah is extracted from the PT MP HCS report which has been peer reviewed by HCSA on July 2018 (http://highcarbonstock.org/wp-content/uploads/2018/07/HCS-Assessment-Summary-Report-Musim-Mas-PT.-MP.pdf). This area of interest were examined primarily in determining the existence of forested areas outside the location permit which were most likely connected to forest patches inside the PT LAP 1, PT LAP 2 and Kas Desa boundaries. To produce forest data with high carbon stocks, land cover data and carbon measurements from forest inventory plots are used.

3.4.2 Satellite image used

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. The satellite image used in this assessment is Landsat 8 OLI-TIRS satellite image path 120 / row 61, with a spatial resolution of 30 meters, and has a spectral resolution of 7 multispectral channels and 1 panchromatic channel. Image selection is based on the best atmospheric conditions, such as cloud cover of the areas must be less than 20%. The acquisition date of the image used in this study is August 3, 2016.

The quality of the Landsat satellite images in the area of the proposed development areas are quite good with cloud cover about 2.5% of the total of proposed development areas, while the area affected by thin clouds (haze) is 6.8% of the total of proposed development areas. To still be able to identify areas covered with clouds and haze in the Landsat satellite images, Sentinel-2 satellite image was used to correct the area that covered with clouds and haze. The acquisition date of the Sentinel-2 satellite image is April 7, 2016. The images used for this assessment were downloaded from U.S. Geological Survey (USGS) at EarthExplorer (http://earthexplorer.usgs.gov/).

In extracting land cover information from satellite imagery and to assist in interpreting the images as well as recognizing objects, radiometric corrections to the Landsat 8 image were carried out. Radiometric correction is done in the form of changing the value of the digital number (DN) to reflectance. This correction can help assessors in distinguishing one object from another object.

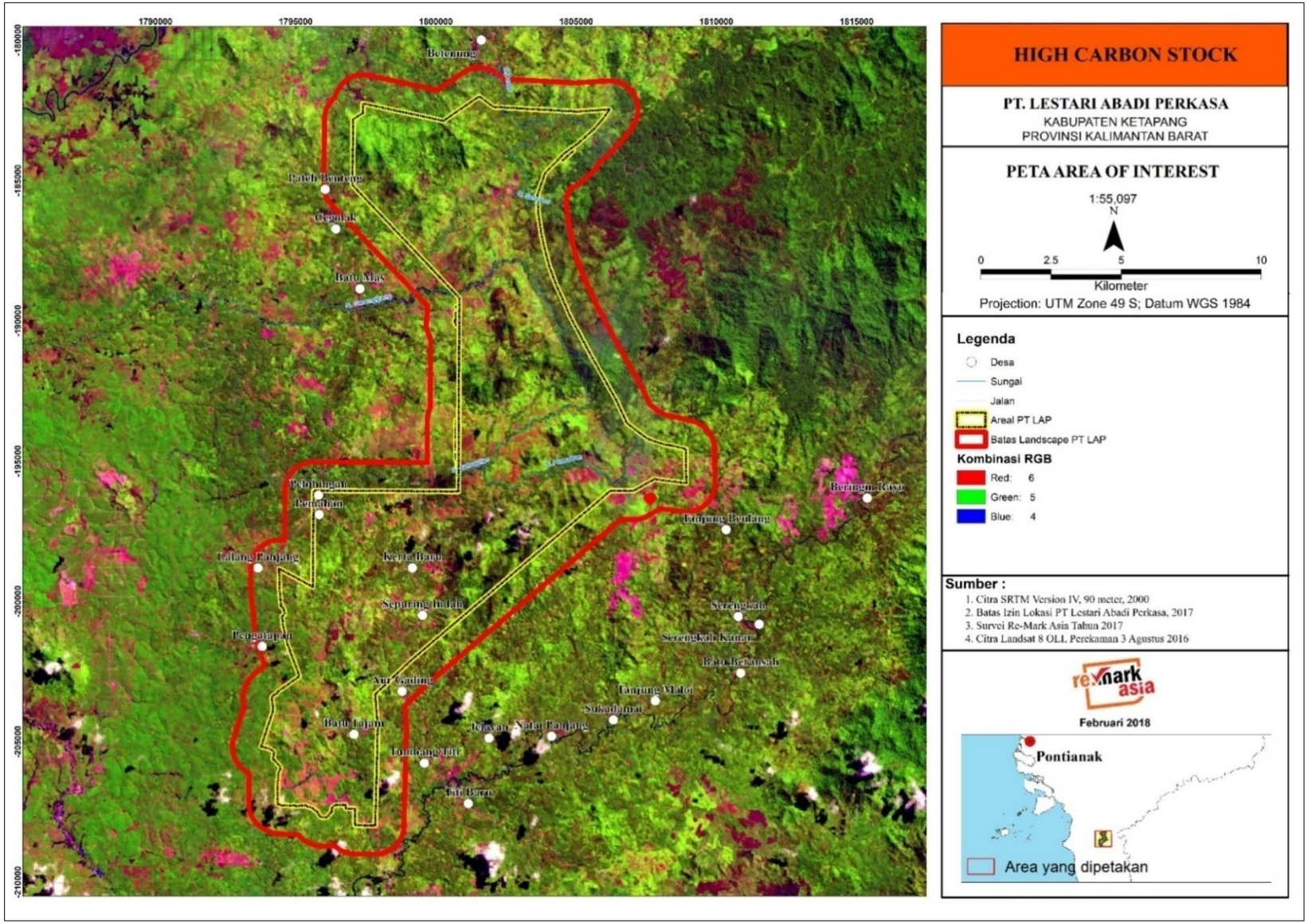

Figure 23. Area of Interest (Landsat satellite image)

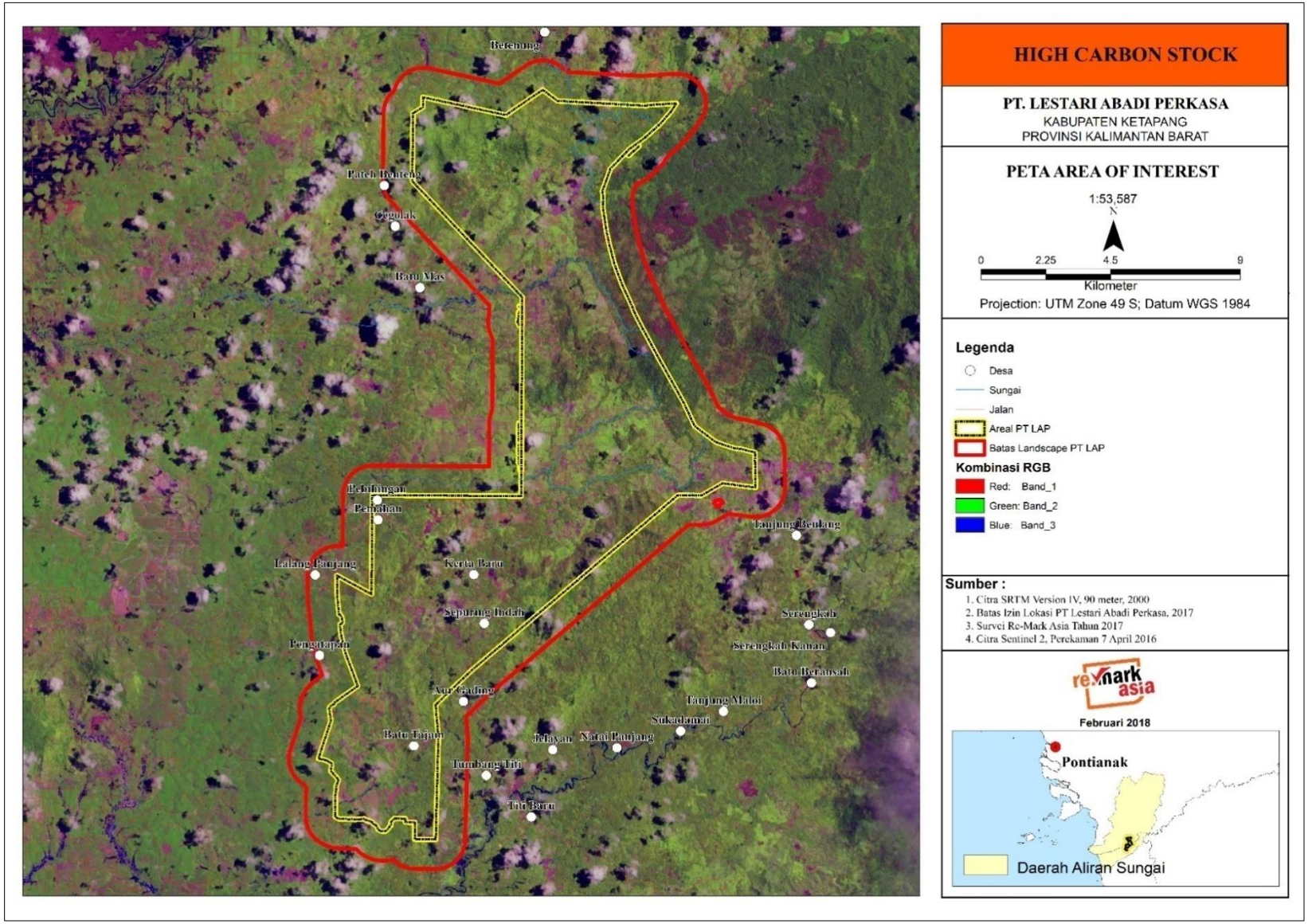

Figure 24. Area of Interest (Sentinel-2 satellite image)

3.4.3 Initial land cover map

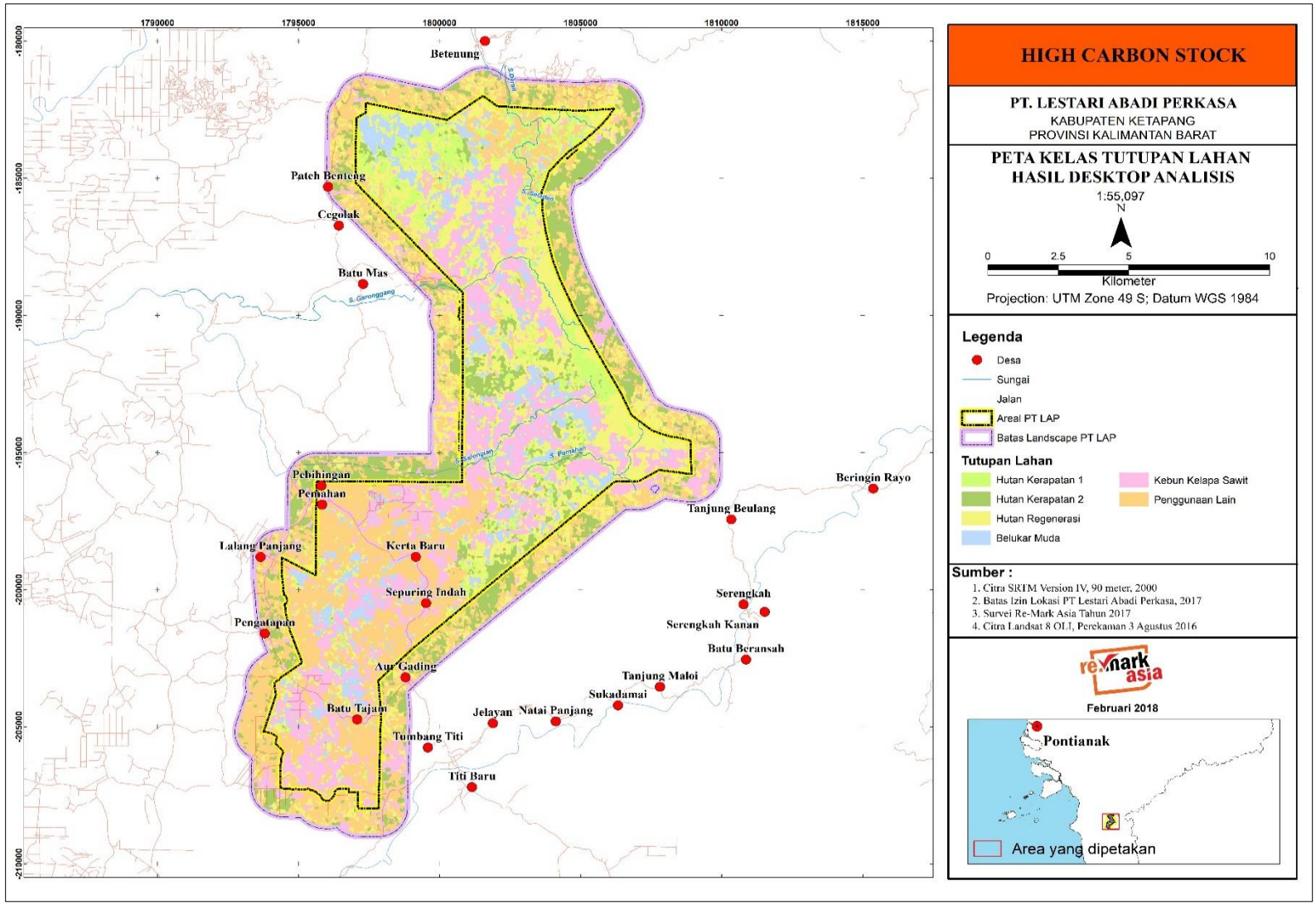

Figure 25. Initial land cover map

3.4.4 Accuracy test

Accuracy testing is needed to get a quantitative assessment that produced through the maximum likelihood supervised classification process. Sampling points taken were 333 points distributed in 6 land cover classes. Determination of the accuracy test sample is calculated based on a systematic grid approach, which produces a population number (N). The number of sampling points (n) is calculated by multiplied the number of population by sampling intensity of 1%.

The results of the accuracy test show that the lowest producers' accuracy is found in the Young Regeneration Forest (YRF) with the value of 69%. The result is quite low because, from the result of groundtruthing, these YRF areas are actaully cultivation and shrubs areas. The small level of producer accuracy is also influenced by the spectral similarity among those land covers in the satellite image, especially between young regeneration forests with shrubs and cultivated land. The highest producers' accuracy is produced on medium density landcover with accuracy reaching 96%. Based on the results of the calculation of the accuracy test it is known that the overall accuracy from this classification activity has a value of 81.08% with a Kappa coefficient of 0.77 (acceptable).

Table 15. Land covers area based on potential HCS class

Land cover class	Size (ha)*	Percentage from total area (%)
Potential HCS class:		
High density forest	-	-
Medium density forest	346.47	2.47
Low density forest	441.15	3.15
Young regeneration forest	2,038.79	14.56
Sub-total	**2,826.40**	**20.19**
Non HCS class :		
Scrub	1,573.84	11.24
Open land	392.65	2.80
Mining, smallholder, plantataion, dll.	9,207.33	65.77
Sub-total	**11,173.82**	**79.81**
TOTAL	**14,000.22**	**100.00**

3.4.5 Sampling design and plot used

The number of inventory sampling points based on the Winrock Calculator is 202 sampling points (Table 16). The Remark-Asia team has conducted vegetation inventory in various land cover classes found at the proposed development areas. The land cover class in the proposed development areas starts from open land (OL), scrub (S), young regeneration forest (YRF), low density forest (LDF) and medium density forest (MDF).

The team succeeded in taking 108 sample points in the forest inventory activity. The number of sampling point taken is enough to represent all the land cover classes found in the proposed development areas. Among all points that have been surveyed, there are 49 points that categorized as HCS land cover class, while the rest of the points are categorized as non-HCS. Those points categorized as non-HCS because when inventory is carried out in the field, the actual land cover of those points are forest area mixed with rubber or fruit trees owned by the community. Because the rubber latex and fruits are still taken by the community, therefore the plot points are included in the other use and agri (cultivation) categories.

3.4.6 Result of carbon stock analysis of each vegetation class

Table 16. Result of high carbon stock analysis of the proposed development areas

Land cover	Plots	Average Stem/ ha	Base area (m^2/ha)	C-stock (ton C/ha)	Galat	Confidence level 90%	
						Upper limit	Lower limit
Open land	10	274	3.00	6.02	0.93	7.74	4.30
Scrub	10	636	9.81	22.79	1.97	26.41	19.16
YRF	17	559	18.00	55.68	12.42	60.94	50.41
LDF	9	480	25.00	97.43	7.93	112.19	82.67
MDF	3	573	46.00	212.10	12.42	248.38	175.82

To find out the real difference value of carbon stock in each land cover, a statistical test is needed. The statistical test used was ANOVA Test and Tukey's Advanced Test. The results of the static analysis in diversity testing (analysis of variance / ANOVA) showed that P-value (0.00) is greater than P-alpha (0.10) shows that the average value of carbon stock in each vegetation class tested is significantly different or has different values. This is reinforced by the value of F-count (105.67) is greater than F-table (2.51). But further testing is still needed to find out more significantly the real differences of each vegetation class. The further test used is the Tukey Test using Mitab 17 software.

The further test used was the Tukey test with alpha 0.10. The vegetation classes that were compared are the medium density forest, low density forest and young regeneration forest which is a potential high carbon stock area. Based on the results of Tukey's advanced test using Minitab-17 software, the results show that the average of carbon stock between medium density forests with low density forest (MDF-LDF), medium density forest with young regeneration forest (MDF-YRF) and low density forest with young regeneration forest (LDF-YRF) are fall in a different class. The medium density forest is in group A, low density forest is in Group B and the young regeneration forest is in group C. This shows the average value of carbon in each vegetation class has a significantly different value.

3.4.7 Patch analysis

The conservation aread are the area that identified as HCS and HCV areas. The identifications of the HCS areas were initiated by merging the density forest with young regeneration forest. Furthermore, the area that has the potential to be HCS is assessed to find out the size of its core area. The forest patches that have core area more than 100ha are categorized as high priority patches and marked as areas to be conserved. The forest patches with core area that fall between 10 to 100 ha were categorized as medium priority patches. The forest patches with core area less than 10 ha are included as a low priority patches.

The next process is to identify patches that are connected between high priority patches. If there are patches that are connected to high priority patches, they are categorized as indicative of conservation. This is because small patches can serve as corridors that connect forest patches with each other. The next step is to separate the forest strata from young regeneration forests. After that, threat analysis (risk assessment) is conducted on the medium priority patch area. Data used for risk assessment analysis are the location of settlements, roads and rivers where roads and rivers are buffered with 1 kilometer buffer while settlements are buffered with 2 kilometers buffer. The medium priority patches that located inside the buffer are categorized as high risk with the note that medium priority patches with forests> 10 ha will be mitigated and indicated as conservation area, while the medium priority patches and low priority patches will be further assessed through rapid biodiversity assessment. The data used for the patch analysis is HCV data that has been buffered with 200m buffer to identify areas that have potential for conservation.

Almost all patches are connected and overlaped with HCV areas. Areas that still have good vegetation are generally located in hilly areas and river banks. RBA is not carried out because all areas identified as HCS areas overlap with HCV areas that have previously been carried out assessment related to biodiversity information. The total area to be conserved in the proposed development areas covers an area of 279.35ha (22.7%).

3.4.8 Final land cover map

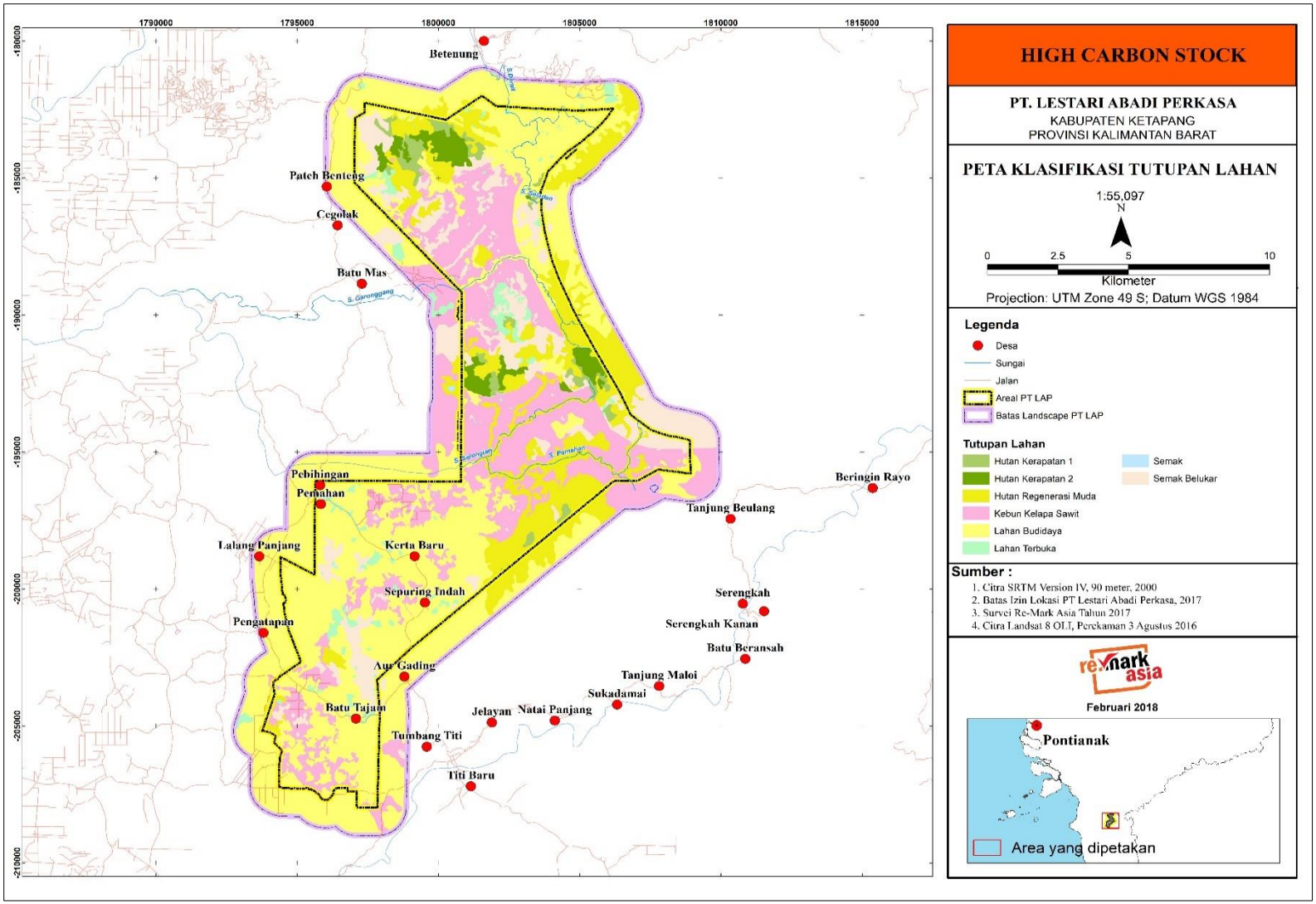

Figure 26. Land cover map that has been corrected with the result of ground truthing

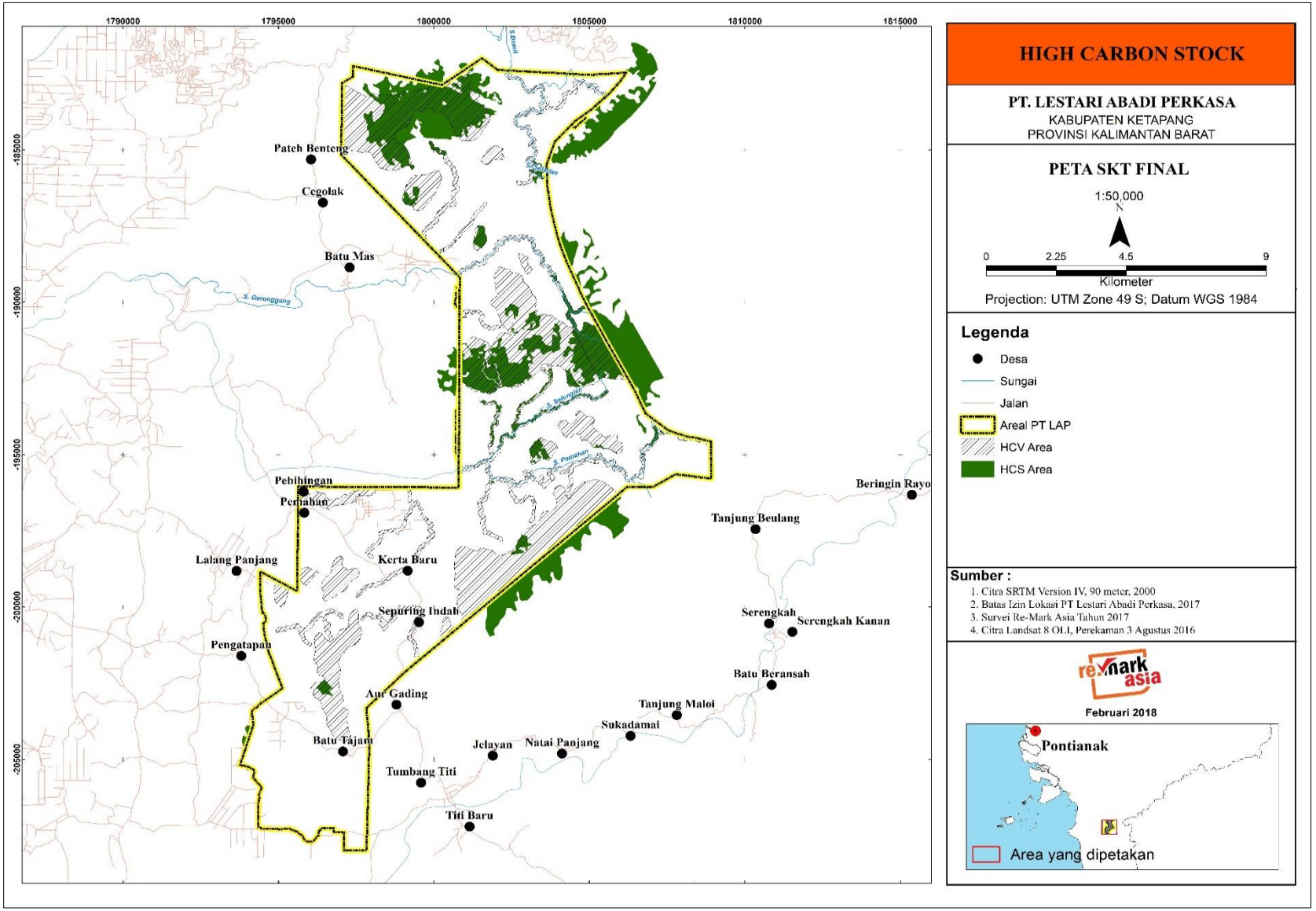

Figure 27. HCS Map of the proposed development areas

3.5 Calculation of green house gas

Four land use scenarios are developed. Their potential emissions are estimated using the New Development GHG Calculator released in August 2016. The scenarios considered are as follow:

Scenario 1: Conversion of the entire assessment area (except for HCV area)

Scenario 2: Conversion of non-forested and non HCV area

Scenario 3: Conversion of non-forested and non HCV area as well as some forest patches that is not viable according to HCSA patch analysis

Scenario 4: Conversion of open land and cultivated land

Musim Mas group has committed to equip all of its mills with methane capture so in all of the scenarios, POME will be treated in a methane capture mill. The potential GHG emissions or sequestrations from the scenarios are calculated using New Development GHG Calculator simplified PalmGHG excel spreadsheet (August 2016).

The New development GHG Calculator estimates emissions from the production of oil palm, and from the change of land use. The net GHG emissions are over the full crop cycle (the default value is 25 years). Projected fertilizer use and fuel use are added in to simulate future operational emission. The projected fertilizer and fuel use are given in **Table 17** below.

Table 17. Projected Fertilizer and Fuel Use for Estate and Mill

No	Category	Value	Unit
1	**General info**		
	FFB Yield	25	tFFB/ha.yr
	OER	25	%
	KER	5	%
2	**Estate fuel**		
	Diesel consumption	1.5	l/ha
	PME consumption	20	l/ha
	Gasoline consumption	8	l/ha
3	**Estate fertilizer**		
	Urea consumption	400	kg/ha
	MOP consumption	500	kg/ha
	RP consumption	200	kg/ha
	Kieserite consumption	160	kg/ha
	Dolomite consumption	40	kg/ha
4	**Mill fuel**		
	Diesel consumption	0.1	l/tFFB processed

The emissions are presented as t CO2 equivalents (CO2e) per unit of product: i.e. per tonne of Crude Palm Oil (CPO) or per tonne of Crude Palm Kernel Oil (CPKO). The boundary of the analysis is from the estates up to the mill.

The average carbon stock value for each land cover strata is taken from the result of high carbon stock assessment conducted by Re-Mark Asia in 2017. The HCS assessment did not measure the average carbon stock for cultivated land and oil palm, so the default value from RSPO GHG Assessment Procedure for New Development was used.

The land cover analysis was conducted using the Landsat 8 OLI-TIERS Satellite Image of August 2016 and complemented by Sentinel 2 Satelllite Image of April 2016. The area of interest for the GHG calculation cover an area of 9,551.7 ha that consist of:

- Entire land of PT LAP 2 (±1,140.00 ha)
- Buffer of PT LAP 1 and 2 (±8,404.70 ha), the five planned Kas Desa are included in this area
- Area of Kas Desa Sepuring Indah (±7.00 ha).

Scenario 1: Potential GHG emissions from conversion of the entire assessment area (except HCV area that cover an area of 577.76 ha).

In this scenario the land area is 8,973.94 ha with the following land covers and carbon stock:

Table 18. Vegetation carbon stock change for scenario 1

Land Cover	Total Area (Ha)		Carbon Stock/ha (Ton C/ Ha)	Total Carbon Stock	
	Before Conversion	After Conversion		Before Conversion	After Conversion
YRF	1,067.65	0.00	55.68	59,446.75	0.00
Open land	146.70	0.00	6.02	883.13	0.00
Shrub	865.64	0.00	22.79	19,727.94	0.00
Cultivated land	6,893.95	0.00	75.00	517,046.25	0.00
Oil palm	0.00	8,973.94	63.83	0.00	572,806.59
Total				**597,104.07**	**572,806.59**
C Stock/Ha (tC/ha)				**66.54**	**63.83**

Scenario 2: Conversion of non-forested and non HCV area

In this scenario the land area is about 7,906.29 ha with the following land covers and carbon stock:

Table 19. Vegetation carbon stock change for scenario 2

Land Cover	Total Area (Ha)		Carbon Stock/ha (Ton C/ Ha)	Total Carbon Stock	
	Before Conversion	After Conversion		Before Conversion	After Conversion
Open land	146.70	0.00	6.02	883.13	0.00
Shrub	865.64	0.00	22.79	19,727.94	0.00
Cultivated land	6,893.95	0.00	75.00	517,046.25	0.00
Oil palm	0.00	7,906.29	63.83	0.00	504,658.49
Total				**537,657.32**	**504,658.49**
C Stock/Ha (tC/ha)				**68.00**	**63.83**

Scenario 3: Conversion of non-forested and non HCV area as well as some forest patches that is not viable according to HCSA patch analysis

In this scenario the land area is about 7,919.74 ha with the following land covers and carbon stock:

Table 20. Vegetation carbon stock change for scenario 3

Land Cover	Total Area (Ha)		Carbon Stock/ha (Ton C/ Ha)	Total Carbon Stock	
	Before Conversion	After Conversion		Before Conversion	After Conversion
YRF	13.45	0.00	55.68	748.90	0.00
Open land	146.70	0.00	6.02	883.13	0.00
Shrub	865.64	0.00	22.79	19,727.94	0.00
Cultivated land	6,893.95	0.00	75.00	517,046.25	0.00
Oil palm	0.00	7,919.74	63.83	0.00	505,517.00
Total				**538,406.22**	**505,517.00**
C Stock/Ha (tC/ha)				**67.98**	**63.83**

Scenario 4: Conversion of open land and cultivated land

In this scenario the land area is 7,040.65 ha with the following land covers:

Table 21. Vegetation Carbon Stock Change for Scenario 4

Land Cover	Total Area (Ha)		Carbon Stock/ha (Ton C/ Ha)	Total Carbon Stock	
	Before Conversion	After Conversion		Before Conversion	After Conversion
Open land	146.70	0.00	6.02	883.13	0.00
Cultivated land	6,893.95	0.00	75.00	517,046.25	0.00
Oil palm	0.00	7,040.65	63.83	0.00	449,404.69
Total				**517,929.38**	**449,404.69**
C Stock/Ha (tC/ha)				**73.56**	**63.83**

Potential GHG emission calculations from each scenario are conducted with the simplified PalmGHG excel spreadsheet using operational assumptions from **Table 22.**

Table 22. Potential GHG Emissions for Each Scenario

No	Description	Scenario 1		Scenario 2		Scenario 3		Scenario 4	
		tCO_2e	tCO_2e/ tCPO	tCO_2e	tCO_2e/ tCPO	tCO_2e	tCO_2e/ tCPO	tCO_2e	tCO_2e/ tCPO
Estate emission									
1	Land conversion	87,575	1.37	78,856	1.40	78,966	1.40	75,963	1.52
2	Crop sequestration	-79,632	-1.25	-70,158	-1.25	-70,277	-1.25	-62,476	-1.25
3	Fertiliser transport	10,652	0.17	9,385	0.17	9,401	0.17	8,357	0.17
4	N_2O emission	10,131	0.16	8,926	0.16	8,941	0.16	7,949	0.16
5	Fuel consumption	227	0.00	200	0.00	200	0.00	178	0.00
6	Peat oxidation	0	0.00	0	0.00	0	0.00	0	0.00
7	Conservation areas seq.	0	0.00	0	0.00	0	0.00	0	0.00
Mill emission									
8	POME	4,335	0.07	3,819	0.07	3,826	0.07	3,401	0.07
9	Diesel fuel	66	0.00	58	0.00	59	0.00	52	0
10	Imported electricity	0	0	0	0	0	0	0	0
11	Mill electricity credit	0	0	0	0	0	0	0	0
12	POME electricity credit	0	0	0	0	0	0	0	0
13	Shell credit	0	0	0	0	0	0	0	0
14	EFB power credit	0	0	0	0	0	0	0	0
TOTAL		**33,355**	**0.52**	**31,087**	**0.55**	**31,116**	**0.55**	**33,424**	**0.67**

Potential GHG emissions from the four scenarios as presented in **Figure 28** are as follows:

- Scenario 1 resulted in potential GHG emission of 0.52 tCO2e/tCPO
- Scenario 2 resulted in potential GHG emission of 0.55 tCO2e/tCPO
- Scenario 3 resulted in potential GHG emission of 0.55 tCO2e/tCPO
- Scenario 4 resulted in potential GHG emission of 0.67 tCO2e/tCPO

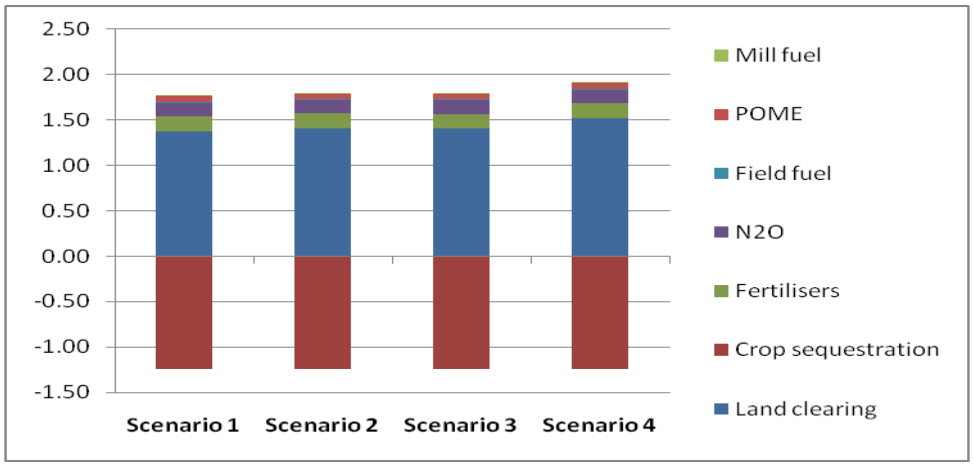

Figure 28. Breakdown of emission from the three scenarios

Potential GHG emissions from all scenarios are net positive due to the higher carbon stock default value for cultivated land as compared to that of oil palm of 63.83 t carbon/ha provided in the RSPO PalmGHG. This has resulted in reduction in carbon stock values after land conversion and hence higher GHG emission. GHG emission in Scenario 2, Scenario 3 and Scenario 4 are higher than Scenario 1 because the carbon stock of YRF measured in the HCSA assessment is lower than the carbon stock of oil palm thus converting YRF to oil palm results in net sequestration. The low value of carbon stock of YRF is due to the fact that the land cover is dominated by young Penaga trees (Schima wallichii) with diameter less than 50 cm. Scenario 1 entail the conversion of all YRF into oil palm thus results in lower net GHG emission than scenario 2, 3 and 4.

The scenario chosen for the development plan is scenario 3. Scenario 3 is selected because it provides the best balance between conservation and development. Scenario 3 included development of small forest patches which have been deemed as not viable by HSCA methodology. The conversion of these patches provide tangible economic benefit to the company with minimum environmental impact.

Please note as per our explanation above that the assessment area is the area of PT LAP 2 that was acquired in 2015 as well as area surrounding PT. LAP 1 and PT. LAP 2 (which includes the five Kas Desa namely Kas Desa namely Kas Desa Batu Mas, Kas Desa Betenung, Kas Desa Cegolak, Kas Desa Kerta Baru

and Kas Desa Pebihingan) and area of Kas Desa Sepuring Indah, the scenario chosen comprise of two areas: area inside the concession of PT LAP 2 which will be developed by PT LAP 2 (±562.24 ha) and area surrounding PT LAP 1 and PT. LAP 2 which may be potentially developed by the local communities in partnership with PT LAP (±7,357.5 ha).

3.6 Land use change analysis

Land Use Change Analysis (LUCA) was carried out using the Landsat 5 and 8 satellite image. There is no compensation liability in this assessment because there is no land clearing and the development of oil palm plantations has occurred in this landscape.

3.6.1 Current land cover

Classification of land cover is an effort to group various types of land cover or land use into a similarity according to a particular system. Visual land cover classification is an activity of image identification through the ability of interpreters assisted with elements of image interpretation to recognize an object. The conclusion of the object or condition of an area depicted in the image is used more than one element, each of which leads to a conclusion of land cover. Jaya (2010) explains that visual interpretation activities have basic diagnostic elements of interpretation that include tones or colors, textures, shapes, patterns, sizes, shadows, locations and associations. The hue is the first basic element that can be recognized from an image, after the same color or hue is grouped and a line has been draw to separate it from other different hues or colors, then the shape, texture, pattern, size and shadow can be recognized. In addition, image interpretation is also matched with field observation data.

Multi-temporal analysis of land cover was used to look at the dynamics of land cover that occurred in the proposed development areas from 2004, 2006, 2009, 2013 and the current field conditions in 2016 which could be used as references in HCV assessment decisions. The results of the 2016 Landsat image land cover analysis, shows that from the proposed development areas was dominated by shrub that cover an area of 293.56 Ha (25.75%). This area has had a significant change in area in the period of 2004 to 2009. Same thing happen for secondary dry land forest (mixed forest) that cover an area of 159.04 ha or (13.95%) which also experienced a significant change in the same period. Changes in land cover that occurred in the proposed development areas tended to occur due to land use activities in the form of land clearing by the local community both for agricultural land, mixed garden land and illegal logging by irresponsible parties.

Changes in land cover from November 2005 to 2016 were mostly caused by non-commercial land clearing, natural succession and community cultivation activities. As an additional, the In-house GIS Team of PT LAP has updated the land use cover change analysis for 2018 and 2019 for completeness.

Complete information on the results of 2019, 2018, 2016, 2013, 2009, 2006 and 2004 land cover analysis in the proposed development area are presented in **Table 23** and **Figure 29 to 35**.

Table 23. Result of land cover analysis in 2004, 2006, 2009, 2013, 2016, 2018 and 2019 in the proposed development areas

Land cover	2004 (Ha)	2006 (Ha)	2009 (Ha)	2013 (Ha)	2016 (Ha)	2018 (Ha)	2019 (Ha)
Secondary dry land forest (mix)	195.32 (17.13%)	169.63 (14.88%)	170.23 (14.93%)	114.18 (10.02%)	159.04 (13.95%)	153.24 (13.44%)	149.64 (13.13%)
Scrub	70.65 (6.20%)	32.14 (2.82%)	31.43 (2.76%)	79.53 (6.98%)	293.56 (25.75%)	243.53 (21.36%)	231.47 (20.30%)
Bush	554.61 (48.65%)	626.37 (54.94%)	620.37 (54.42%)	287.10 (25.18%)	266.63 (23.39%)	322.98 (28.33%)	350.81 (30.77%)
Mix garden	254.93 (22.36%)	248.77 (21.82%)	256.99 (22.54%)	649.67 (56.99%)	403.06 (35.36%)	374.22 (32.83%)	348.25 (30.55%)
Open land	64.49 (5.66%)	63.09 (5.53%)	60.98 (5.35%)	9.52 (0.84%)	17.71 (1.55%)	46.03 (4.04%)	59.83 (5.25%)
Oil palm	0.00 (0.00%)	0.00 (0.00%)	0.00 (0.00%)	0.00 (0.00%)	0.00 (0.00%)	0.00 (0.00%)	0.00 (0.00%)
Total (ha):	**1,140.00 (100%)**	**1,140.00 (100%)**	**1,140.00 (100%)**	**1,140.00 (100%)**	**1,140.00 (100%)**	**1,140.00 (100%)**	**1,140.00 (100%)**

Source: PT Remark Asia's Landuse and Land Cover Change Analysis Report, 2018; updated landuse change analysis 2018 & 2019 by PT LAP.

Secondary dry land forest (mixed forest) based on BSN land cover classification, (SNI 7645-2010) is described as a forest that grows in dry land habitats (in the lowlands, hills, mountains or highland tropical forests) that have experienced human intervention or has revealed traces of logging with diverse vegetation. The variety of vegetation in the identification area shows land use between rubber, bamboo and low-density fruit trees.

Tapping rubber trees, the utilization of bamboo and fruits are part of the cultural tradition of planting patterns of Dayak people in the Ketapang Regency area. Land clearing activities and the planting of rubber, bamboo and fruit are recognized traditionally as a way to show "land use and ownership." Now rubber is rarely tapped and only tapped when the price of rubber is good or they do it because they have no alternatives.

The use of dry land agriculture mixed with shrubs is also part of the cultural tradition of the Dayak. Slash and burn technique that once became a common practice of subsistence agriculture which has been banned in recent years. Now a dilemma for farmers because they have to change the system of their agricultural cropping patterns, the choice of land clearing is now far more expensive and mostly beyond the financial reach of traditional farmers, let alone uncertain results due to global climate change and

plant pest attacks. In general, the area of shrubs and shrubs is an area of ex-cultivation of people who have been temporarily left behind before being cultivated.

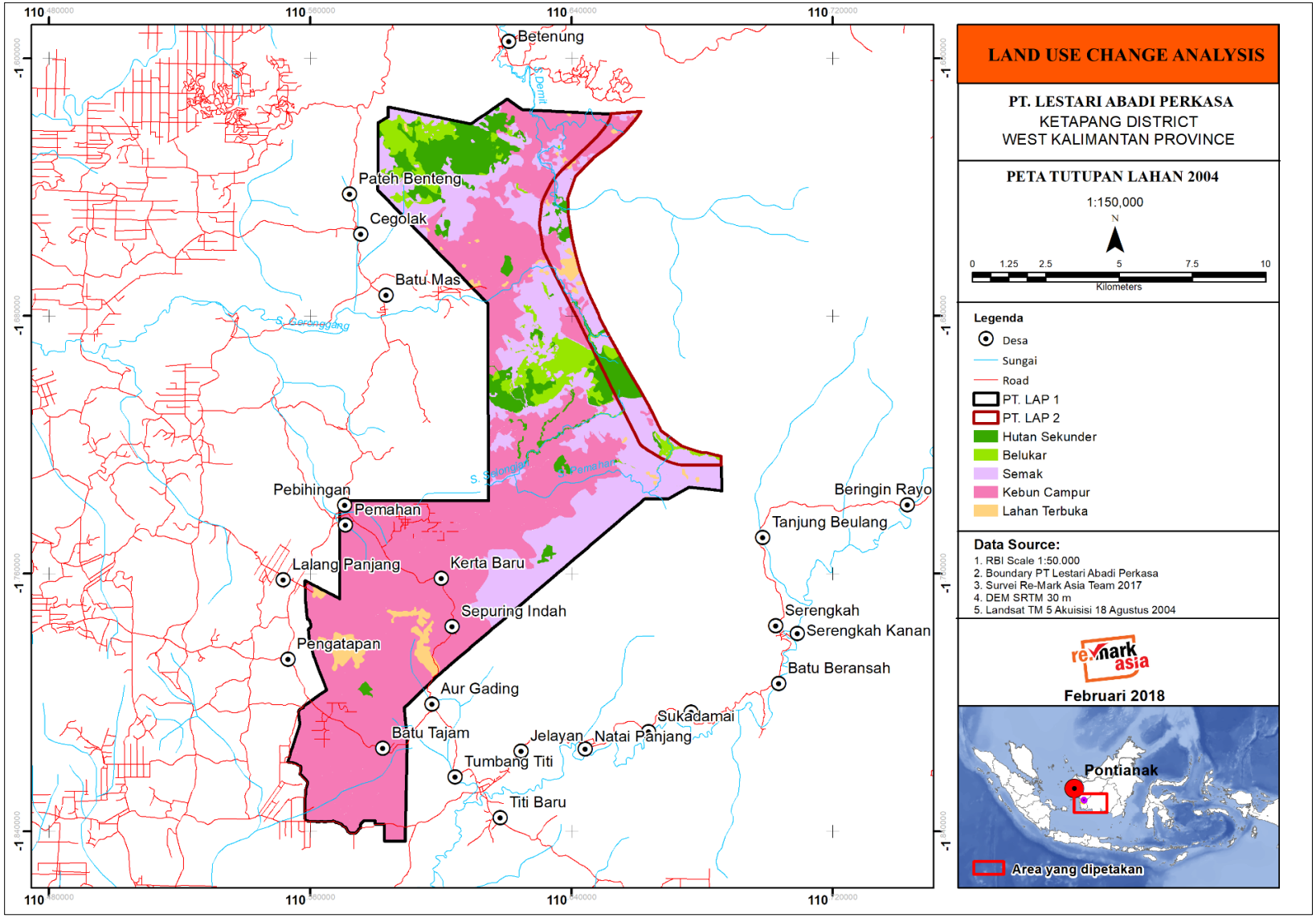

Figure 29. **Land cover map 2004**

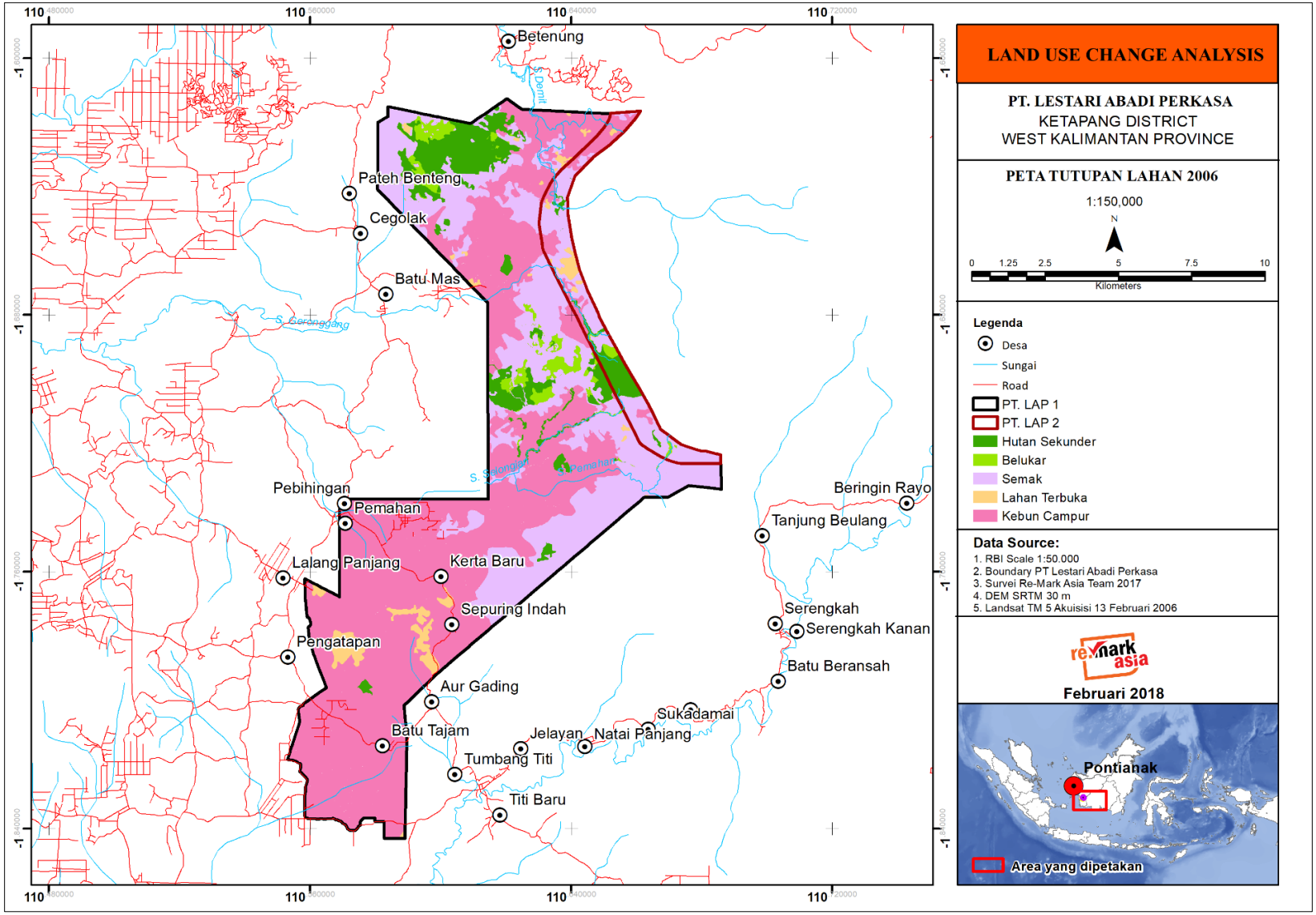

Figure 30. **Land** cover **map 2006**

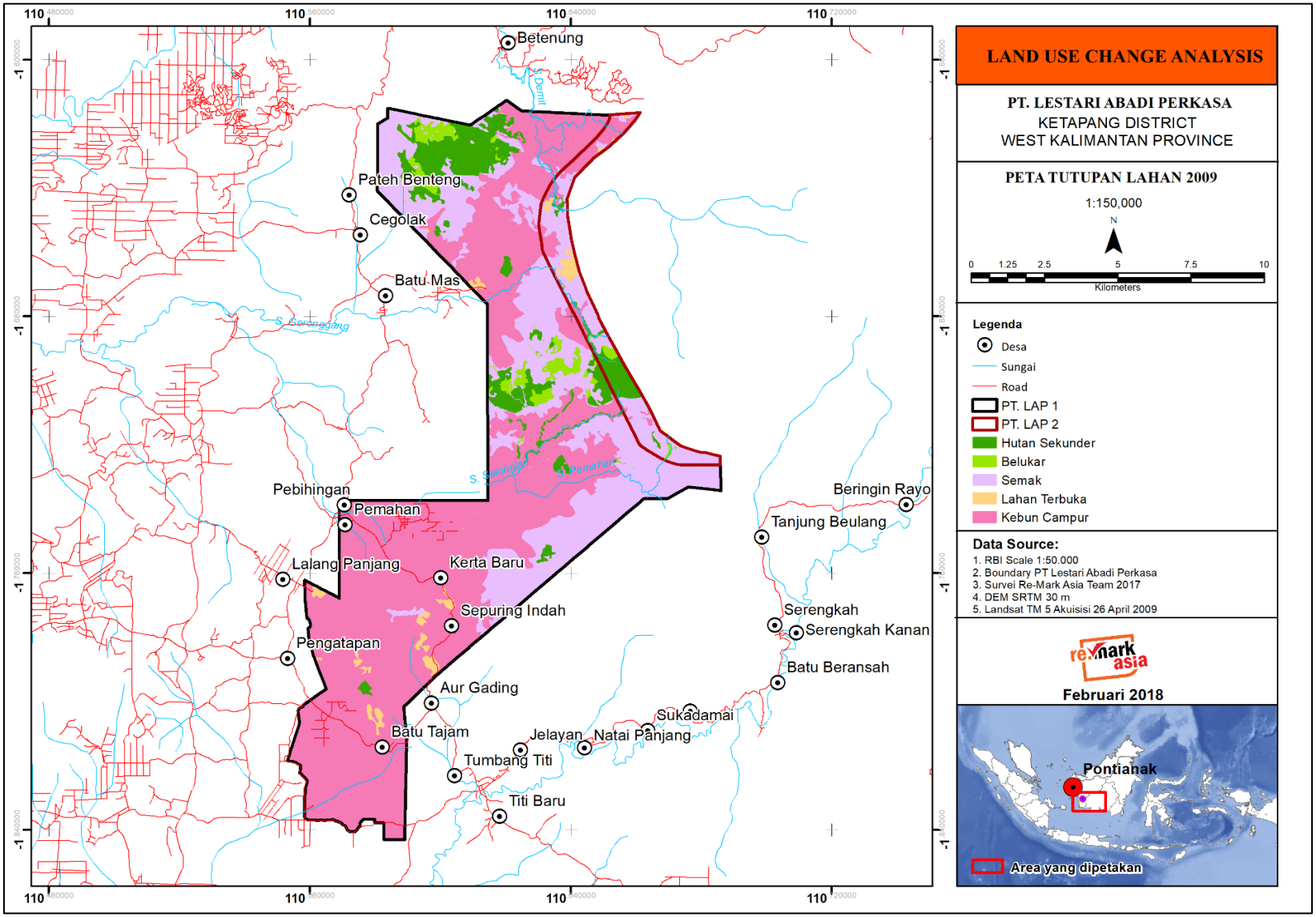

Figure 31. Land cover map 2009

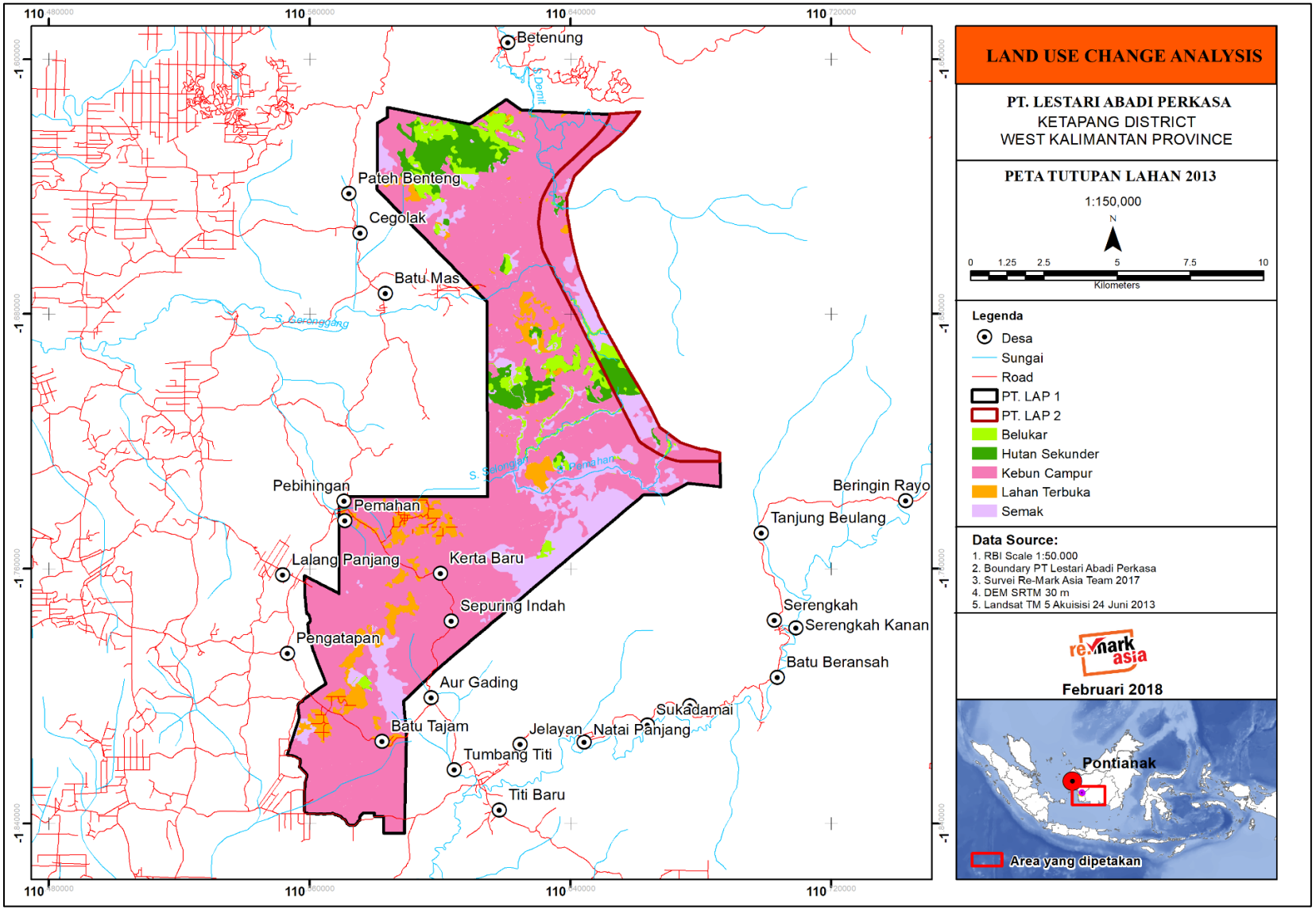

Figure 32. Land cover map 2013

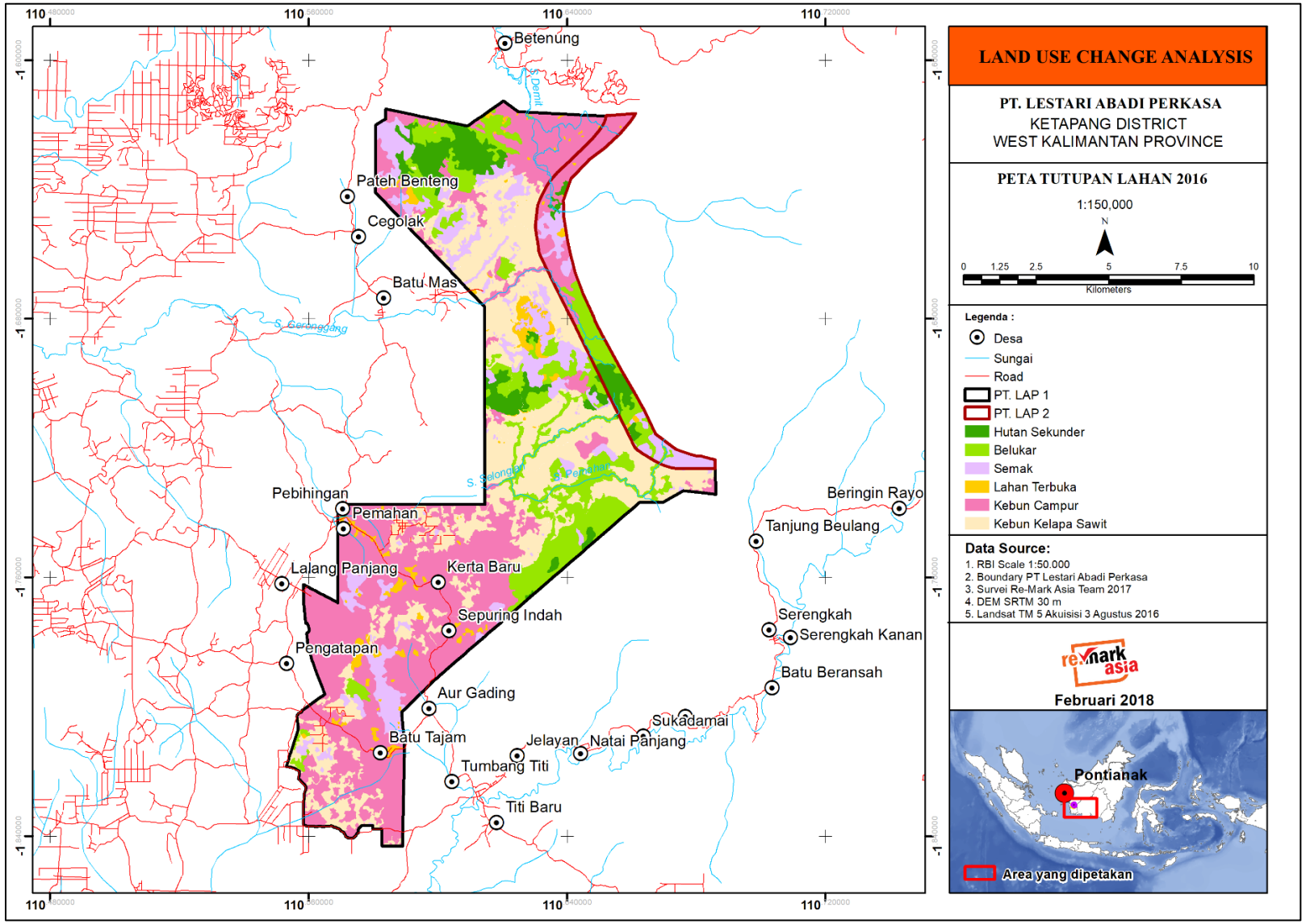

Figure 33. Land cover map 2016

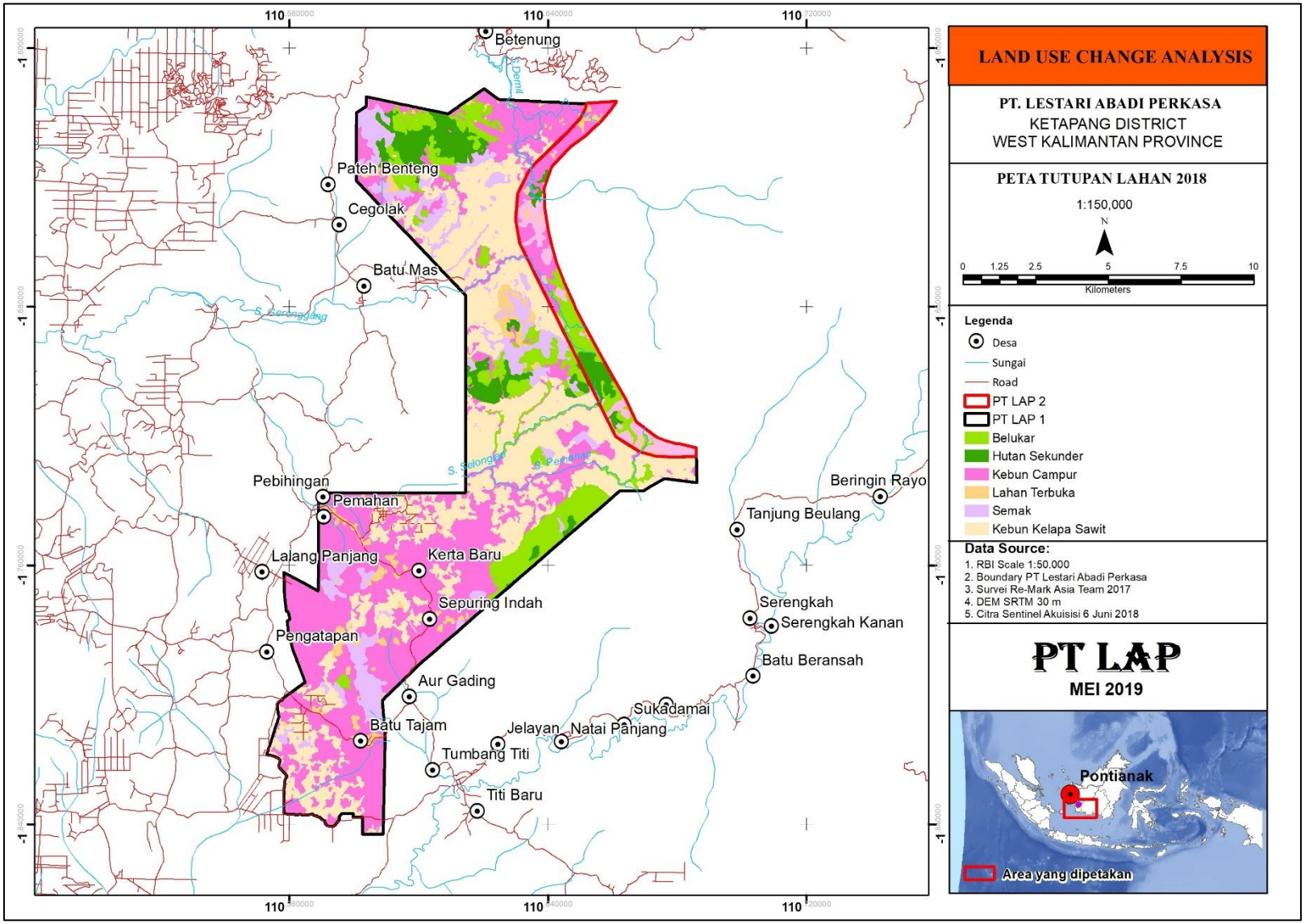

Figure 34. Land cover map 2018

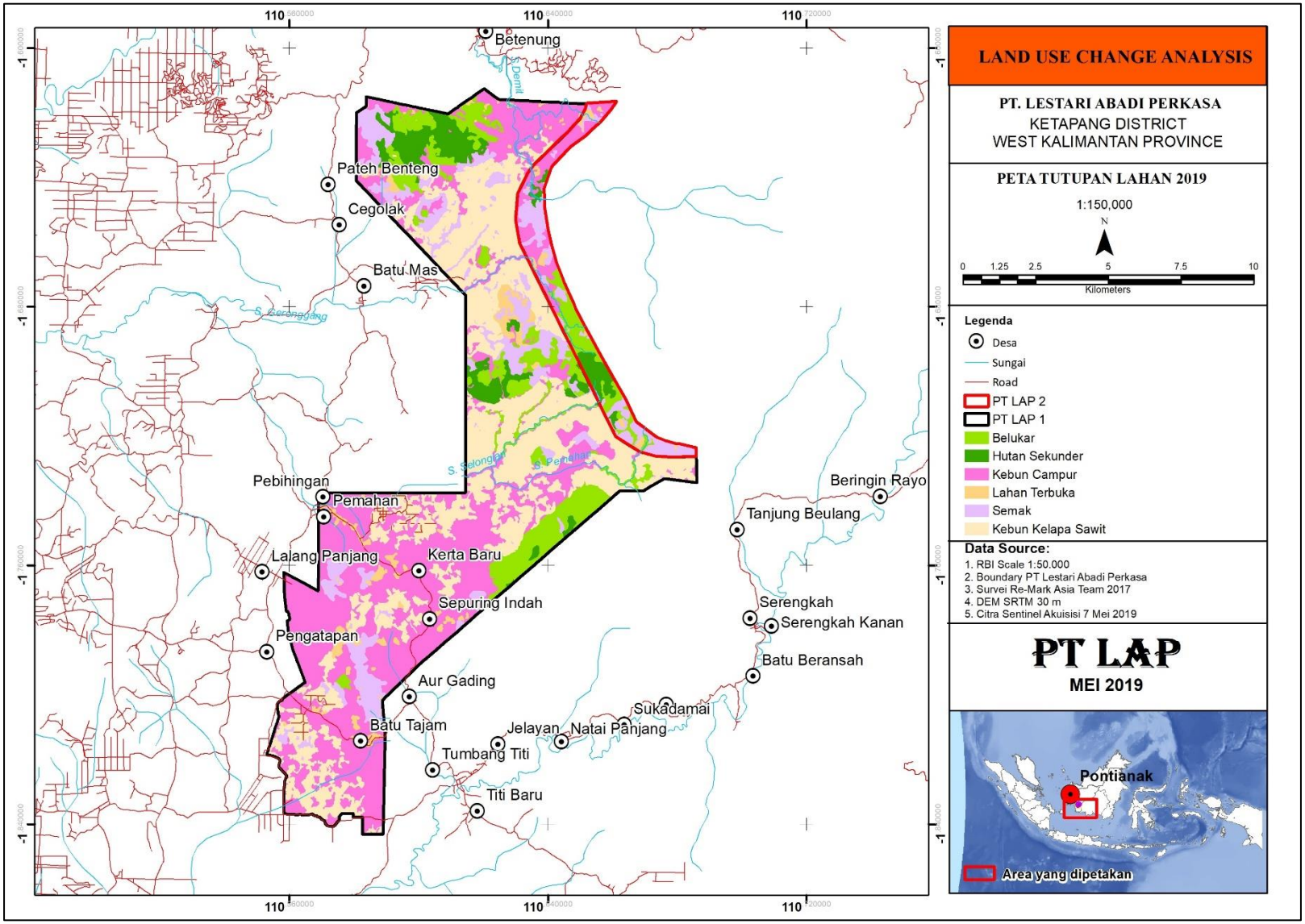

Figure 35. Land cover map 2019

3.7 FPIC and social impact assessment

3.7.1 FPIC process

The proposed development areas have carried out an engagement activities to the local community before any planting activities take place. The engagement activities were carried out based on the principle of Free Prior and Informed Consent (FPIC). The FPIC of the proposed development area is an inseparable part of FPIC process of PT LAP 1, because both situated in the same villages. The stages of FPIC for land acquisition that have been carried out include the following:

3.7.1.1 Socialisation with key stakeholder

In 2010, formal and informal engagements were carried out by PT LAP to stakeholders such as the government and the community. This approach is in the form of providing information related to the planned development of oil palm, palm oil mills and scheme smalholder by PT LAP. To provide this information, representatives from the village goverment, traditional structure and local communities were invited to conduct comparative study activities in West Sumatra. Through these activities, the community can directly see the implementation of the ongoing scheme smallholder program. With the visit, participants can have better understanding on the details of the program and the benefits of the program when it is implemented in their area.

The socialization of plantation development was carried out in June 2011 in Betenung Village, Cegolak, Batu Mas, Pebihingan, Aur Gading, Pengatapan Raya and Batu Tajam. The socialization activity was attended by 232 participants consisting of Village heads, Village officer, Head of BPD, Traditional figures, Community leaders and Neighborhood communities. From the results of the meeting, the community accepted the socialization of the PT LAP oil palm plantation development plan, provided that they did not plant in productive community plantation land.

In 2015 PT LAP obtained an additional permit covering an area of 1,140 ha (the proposed development areas), where the location was in 4 villages, namely Batu Mas Village, Cegolak Village, Betenung Village and Tanjung Beulang village. The managements of PT LAP have been communicated and engaged the local communities. In principle the local communities around the proposed development areas are supportive with the PT LAP's operational and development plan. In addition, as part of the CSR program, PT LAP will also develop Kas Desa (oil palm plantation owned by village and managed by the company). The consultation and communication with the village representative regarding the development plan of Kas Desa has been carried out intensely. The agreement between the company and the village has been developed and agreed.

3.7.1.2 Participatory survey to identify land use

PT LAP has begun the FPIC process even before the development of PT LAP. One of the FPIC processes before conducting operations was a participatory survey activity that was conducted on September 23 to November 15, 2010. In 2017, PT LAP conducted re-survey to indentify landuse through participatory mapping covered PT LAP 1 and LAP 2. The purpose of the activity was to obtain the indicative village boundaries that were within the location permit and to know the type of the land cover and land use. Measurements were made using GPS by measuring polygons in each difference of land cover and village boundary. This measurement was accompanied by community representatives appointed by the relevant Village Head. The participatory survey was attended by 54 representatives from 7 villages. The eight villages that participated in the survey were Betenung Village (5 people), Cegolak Village (9 people), Batu Mas Village (14 people), Pebihingan Village (9 people), Pengatapan Raya Village (6 people), Aur Gading Village (5 people) and Tanjung Beulang Village (6 people).

3.7.1.3 Company's Procedure

PT LAP has procedures developed based on FPIC principle to assist management in approaching communities (landowners) and involve them in the consultation process to ensure that HCV, HCS, social value and land acquisition assessments are understood and agreed. The FPIC stages are as follows:

a. Discuss with the communities about the process and the land status to create information flow and understanding (Ensure legality requirement are met and all permits are obtained).
b. Create understanding and engagement process that the SEIA has been completed.
c. Socialization and communication with communities and other stakeholders.
d. Identification of land ownership and mapping.
e. Discuss and explain process to land owners and come to an agreement.
f. When consent is given the compensation process is carried on; If the land owners object, the company must respect the decision.
g. Land clearing will be carried out after the compensation process is completed.
h. Implementation and monitoring of FPIC and its documentation.

The process of determination of land use/access for communities is carried out in consultative way through focus group discussion, interview, stakeholder consultation, socialization and agreement with local communities. Besides, PT LAP also has procedure for land compensation and complains & grievances etc. that always been socialized to the stakeholders. The land that still operated by the local communities will not be converted to oil palm unless there are consent form them.

3.7.1.4 Participatory mapping

The proposed development plan areas's participatory mapping was carried out in 2016-2017 by the PT LAP participatory mapping team in collaboration with surrounding village communities. The participatory mapping activities were carried out in village basis. PT LAP 1 and 2 are located in the same village. Participatory Mapping is defined as the process of land use mapping, conducted by the local community to describe the relationship between land and/or other resources with the local community. Participatory Mapping is an important step in the effort to respect, protect and realize the rights of local people over FPIC. The right to FPIC is seen as one of the important principles in international law related to human rights to protect indigenous peoples and local communities from the disturbance of life, culture and sources of livelihood.

In its implementation, Participatory Mapping provides not only important benefits in the description of land relations and / or other resources with related communities, but also can help prevent and mitigate potential land disputes related to community ownership and utilization of land. The stages of participatory mapping include internal planning and coordination, communication and socialization of the introduction of HCS concept to the local community, the formation of a participatory mapping team, participatory mapping training for the implementation team, data collection and processing, draft maps, verification and validation with the community, final map making, public consultation and participatory mapping reporting. From the results of participatory mapping some information has been obtained, such as maps of the land use patterns, village boundary maps and land ownership information.

The results of land identification indicate that in general the condition of land cover around PT LAP is mixed cultivation land (rubber, cempedak, durian etc.). In addition, there are also several rice fields in the lowland area. Nearly all areas have been opened or have been controlled by local communities, except for hills and steep areas. Most natural forests have been cleared for cultivated land and can only be found in hilly areas and steep areas far from settlements. The area is still maintained because of the difficult access and bumpy / sloping topography.

3.7.1.5 Land ownership information

The study of land ownership has been carried out by PT LAP management during the FPIC process and land acquisition and continued when it was operational. In 2009-2010 before PT LAP operated, the company had conducted a participatory survey to identify land use patterns. Then in 2017 PT LAP re-conducted participatory mapping activities. Generally, the community has more than one piece of land with an average ownership between 2 to 10 ha per person. Most people use their land to plant rubber and fruit trees (durian, cempedak etc). The owners of the forest land in hilly areas far from the settlement have not been identified yet, however, the ownership status of the land will be further consulted with the local community in final land use planning.

The indication of local community garden of the surrounding community was assessed from the results of social impact and high conservation value (HCV) assessment. This includes the aspects of basic needs (HCV 5) and community culture (HCV 6), especially those related to meeting basic needs. The basic needs of the local community such as rice, vegetables, fruit, fish and meat are generally fulfilled from the results of cultivation or from natural products, except for cooking oil, wheat flour, salt, sugar, tea, coffee etc. Those products are usually obtained by purchase it at the local market. The availability of these basic commodities is relatively stable either from price, supply and stock. Access and prices for obtaining basic commodities are relatively affordable by the community with quality that is suitable for consumption.

Considering the existence of alternative sources of foods to fulfill the basic needs of the surrounding community, the availability and the sources of cash income as well as the conditions of availability, stability, affordability and quality of food for the local communities, it can be concluded that the condition of the surrounding community food security is secured and indicate that the local communities around the proposed development areas are communities who are able to meet their basic needs for foods.

The issue that becomes a risk in the future is that the source of income is still very dependent, especially on rubber commodities. Other sectors are still underdeveloped such as agriculture, livestock, fisheries, household handicrafts, trade, transportation services, oil palm plantations, and other sectors. Decreased land for shifting cultivation and a government ban to carry out farming activities with a burning system, relatively unstable rubber commodity prices, the ability of surrounding companies to absorbing labor become the risk to local community's income sources which will affect the economic stability of surrounding communities.

Participatory mapping identifies important areas of food security, where the existence of food crops is generally around the area of community settlements or planted as an additional source of foods that planted around the house. Aside from planting themselves, the need for food crops is also fulfilled by buying. In this participatory mapping activity, although it does not calculate the minimum area for the community garden, these areas have been identified, which located around the residential area. This matter will be taken into consideration in the development of PT LAP's social management plan. Maps of participatory mapping results and maps of indications of village boundaries are shown in **Figures 36 and 37**.

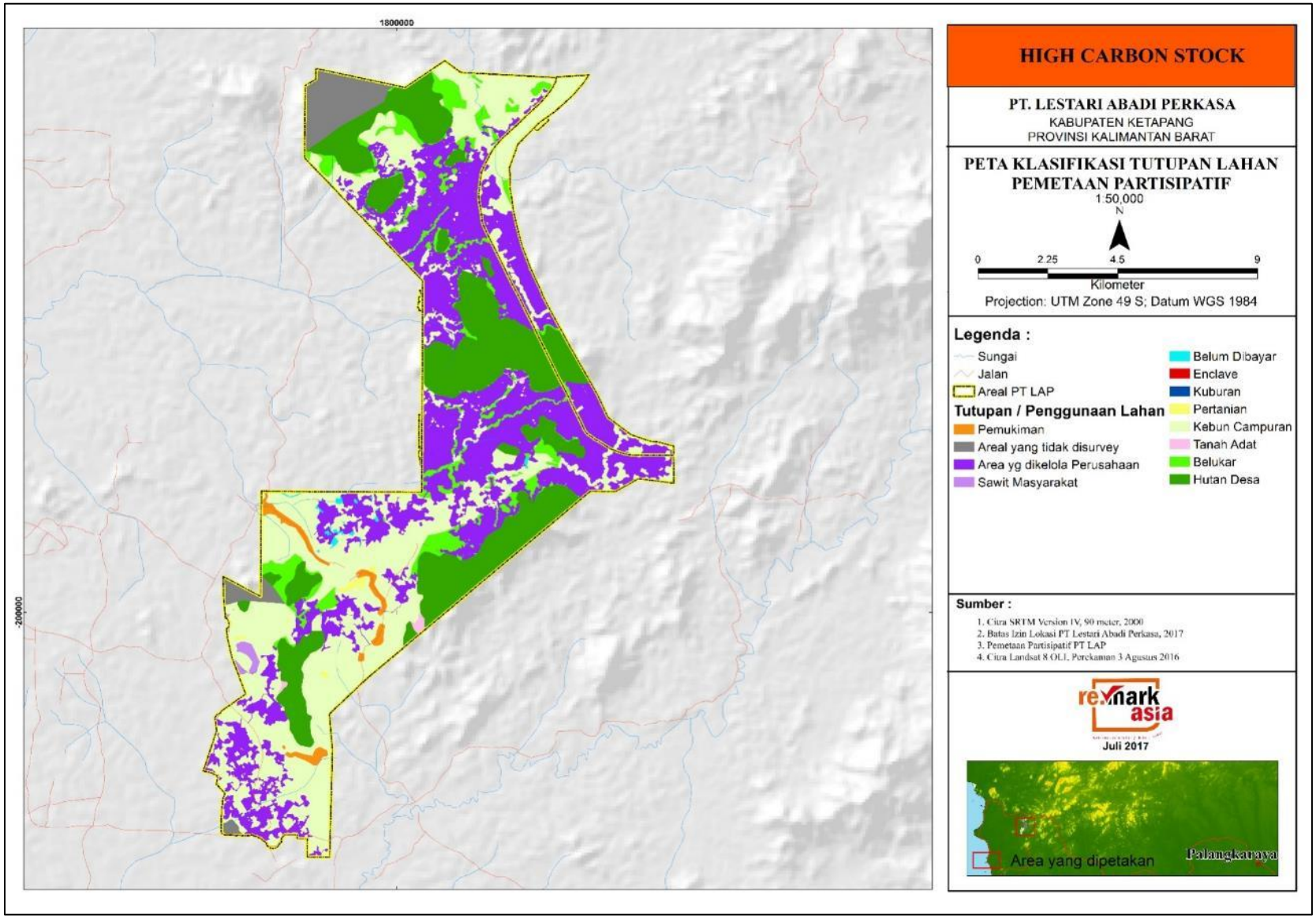

Figure 36. Land use map of the proposed development areas

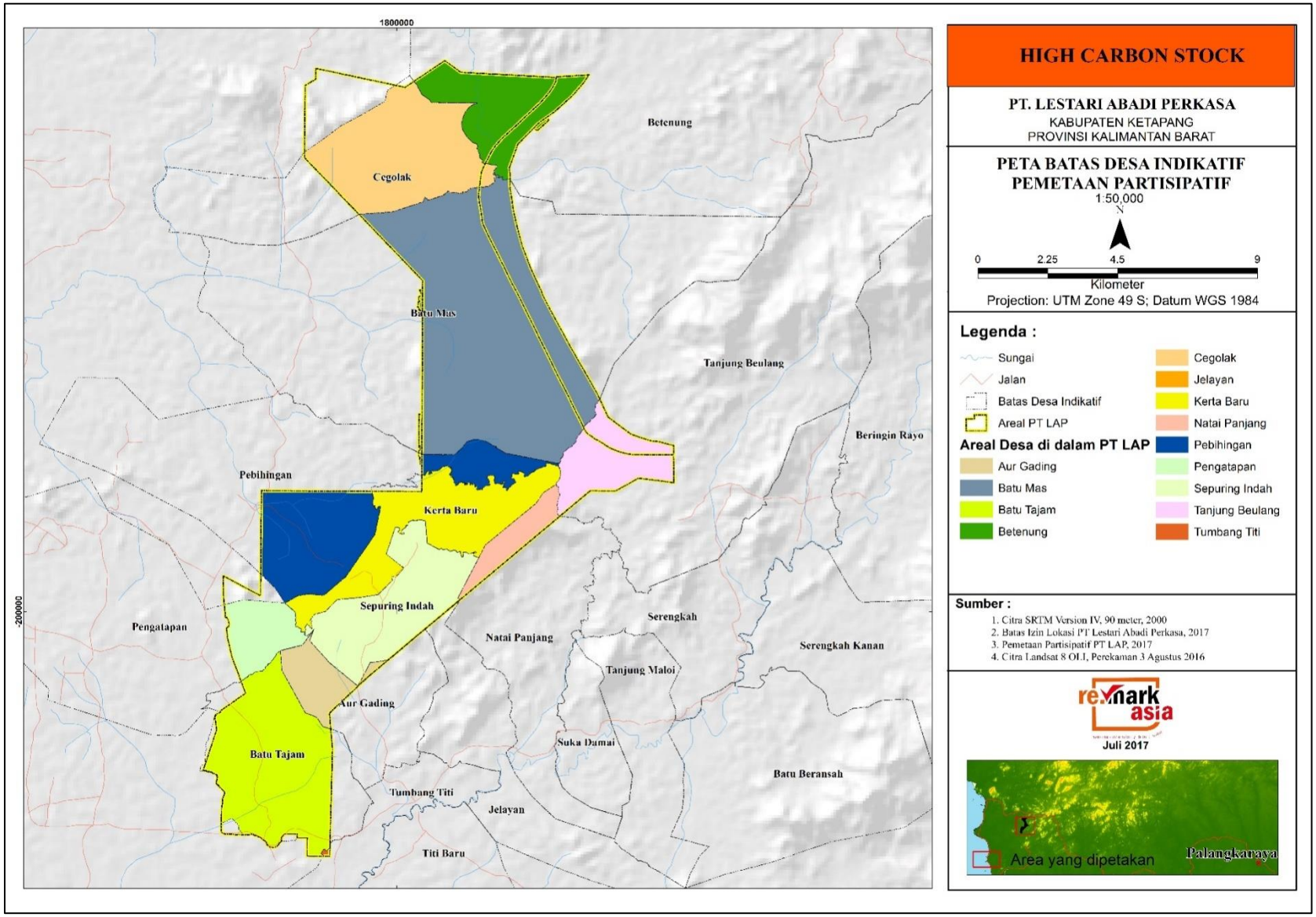

Figure 37. Village indicative boundary map in proposed development areas

3.7.2 Social impact assessment

The social impact assessment was conducted over 28th February – 4th March 2017. The number of meetings held was 5 formal meetings and 1 informal meeting. There were a total of 78 participants who attended the meetings. Participants are come from the Pemahan, Tumbang Titi and Nanga Tayap Districts. In addition to the meeting, the study team also conducted observations in the field.

Negative key issues are an indicator or a clue of threat existence to PT LAP Plantation which if not managed will result in negative social risks and social impacts, while positive key issues are opportunities for PT LAP Plantation which if managed properly will result in a positive impact. The identification of key issues could be obtained through stakeholder consultation (a consultation within parties) which was done through FGD (Focus Group Discussion) meeting with management unit, village level officials, villagers and through interview results of parties located in the field. These key issues were then triangulated in the field and the results were analyzed as Social Impact Study.

The identification of either positive or negative social impacts and risks potencies aims to predict the possibilities arising from the problems, social issues or impacts that have occurred. Based on this, immediate steps or mitigation actions could be taken against the potential negative impacts, therefore; they would not become company risks and social impacts for the community. On the other hand, potential positive impacts could be managed to support better management of the company. Potential important social impacts and risks identified within external and internal environment of the company obtained from social issues, social impacts and food security of the community around PT LAP Plantation are outlined as follows:

1. Human resources (*SDM*) around the company is seen through education level, knowledge or community skills that are relatively still lacking or low.

2. Community dependence on natural resources (*SDA*) is still high, especially to fulfill basic needs and cash income sources. Commonly, the community has not been able to carry out cultivation activities in almost all sectors intensively.

3. Community cash income sources are not relatively varied. Agriculture, animal husbandry, fisheries, home industry, trade, services, plantations sectors, etc (except rubber and palm oil commodities) are still undeveloped.

4. The price of rubber commodities is relatively low or not profitable if harvested.

5. Employment needs are still high, while surrounding companies are still limited regarding the available employment, in a sentence, unable to accommodate the local community's employment needs.

6. The management of natural resources by local community is not optimal. This is mainly due to HR factors and limited business capital owned by local community.

7. There have not been all communities who own lands in PT LAP location permit area submit their management to PT LAP. Management locations that are still in spots cause the management costs per hectare to be high.

8. CSR assistance is still in the forms of financial assistance, building materials, educational infrastructure, etc. There has not been CD program which is to develop the productive economy of local community.

9. The distribution of CSR assistance can be more evenly distributed to surrounding villages, this is risky as it could arouse social jealousy.

10. Socialization outreach has to be more extensive touched all society circles, especially lower class society.

11. Safety and security communication system between the community and plantation is extremely needed in anticipating emergency conditions, thus, the forming of the system should be initiated and agreed by plantation party and local community.

12. High community interest in developing palm commodities both independently and in collaboration with PT LAP.

4. Summary of management plan

Recommendations from each assessment are formulated into an integrated management and monitoring plan. Total proposed new planting are 604.24 ha consist of PT LAP 2 core and 6 Kas Desa (Betenung, Cegolak, Kerta Baru, Pebihingan, Sepuring Indah, Batu Mas). The planting will start from 2019 to 2020, the detail information is tabulated below.

Table 24. Area and time plan for new plantings

Location	HCV area (ha)	Total area (ha)	Develop area (ha)	Timeline
PT LAP 2	577.76	1,140	562.24	2019-2020
Kas Desa	0	42	42	2019-2020

4.1 Team responsible for developing management plans

In order to enable effective implementation of the programs, it is required that human resources competencies, sufficient knowledge and skills to implement the planned activities are in place. It is also essential to provide appropriate tools and facilities so that implementation of the activities can be smoothly carried out. Implementation, management and monitoring in the field will be implemented by the management of PT LAP, onsite Sustainability team and Public relation team. The implementation is also supported by other team such as audit and certification team. The overall responsibilities and accountability are listed below:

a. The Estate Manager is directly responsible for the implementation of the management and monitoring plans. The specific responsibilities are:
    - Implementation of the management and monitoring plan and review periodically.
    - Organize and implement actions specified in the management and monitoring plan.
    - Organize and implement monitoring activities.
    - Organize socialization / training where required in the management and monitoring plan.

b. The Senior Estate Manager is responsible to fulfill the requirements of the management and monitoring plan. The specific responsibilities are:
    - Cross check the implemetation of management and monitoring plan in the estates under his charge.
    - Ensure timely and effective implementation of the management and monitoring plan.
    - Analyze monitoring results and review mitigation actions where needed.

c. The Senior General Manager is accountable and responsible to ensure that the overall development plan including the management and monitoring plan is implemented according to the time plan and budget. The specific responsibilities are:

- Hold meeting to review results of implementation and results of monitoring.
- Review action plans when necessary.

d. The Public Relations Team has a role in communicating with the related stakeholders around the concession of PT LAP. Specifically, the roles and responsibility are as follows:

- Communicate with related stakeholder around the concession to implement the management and monitoring plan at the landscape level.
- Communicate with related stakeholder to schedule meetings among with PT LAP.

e. A Sustainability Staff is located in PT LAP to assist the management team in the implementation of the management and monitoring plans that has been approved by the management. The Sustainability Staff is responsible to:

- Work hand in hand with the estate management team in implementing the management and monitoring plan that has been approved.
- Conduct training, work in collaboration with Estate and Public Relation personnel on stakeholders' engagement and consultation.
- Review results and identify further actions that are necessary and communicate it to the management of PT LAP.
- Prepare a progress report of the management and monitoring for the management of PT LAP and Sustainability Head Office.

f. The overall concervation progamme will be under the purview of the Estates Department with support from the Head Office (HO) in Medan and the Director of Sustainabilty will provide the overall guidance and technical support to enable effective implementation of the management and monitoring plan in the field.

g. These programmes will be reviewed and evaluated by the local and top management regularly. These will include evaluation of the activities implemented as they are expected; whether the outputs of the process are as they were projected previously; and whether the resources investments (human, fund, time etc.) are as they were planned before. The objective is to measure the achievements, effectiveness, efficiencies, impacts, and sustainability of the programs.

4.2 Elements to be included in management plans

4.2.1 Social and environmental impact management plan

No	Monitored parameter	Proposed Enhancement/ Mitigation Measures	Location	Measurement	Frequency	Management Institution	Estimated Time-frame for completion of task
1	Decreasing Air Quality	• Regulate traffic and supply traffic signs, provide regulate traffic speed. • Regulating the timing of activities at the location of activities • Spray before doing physical work. • Facilitating community members who want to work and do business around the technical area. • Conduct counseling to workers to use work safety equipment. • Provide assistance with guard fees and medical / health care assistance. • Allocate funding to carry out socialization mentioned above.	Company and the community housing of the Betenung, Cegolak, Batu Mas and Tanjung Beulang villages.	Data of dust in the air are collected by directly in the field, analyzed by accredited laboratory.	Every 6 months.	• PT LAP • Related agencies from the government	Management and monitoring are carried out every 6 months and continuously
2	Decreasing Surface Water Quality	• Maintain a green belt area (green belt) along the existing river border and plant the plants that have ecological functions. • Maintain waterways / drainage and road facilities through hardening and leveling of damaged / erosion road surfaces. • Conducting road compaction and road shoulder properly so that it can reduce the danger of erosion or landslides due to a labile pile structure. • Road construction is equipped with side channels and road shoulders planted by cover	Pemahan and Demit River, the community wells.	Water samples at determined points, observation in the field. Laboratory Analysis on the quality parameter in accordance Government regulations No 82/2001	Every 6 months	• PT LAP • Related agencies from the government	Management and monitoring are carried out every 6 months and continuously

No	Monitored parameter	Proposed Enhancement/ Mitigation Measures	Location	Measurement	Frequency	Management Institution	Estimated Time-frame for completion of task
		crop land. • Creating a drainage channel to remove excess water, control the speed of water flow and direct the flow of water, the drainage channel is connected to a sediment catching pool.					
3	Increasing erosion rate	• Carry out gradual cleaning to maintain the topsoil layer and the remaining soil organic matter as logging cover crops. • Stacking tree trunks (which are not used), cutting the slope so that it can withstand surface flow and erosion rates. • Road construction with specifications for convex and compaction of roads with rocks and gravel provided around the plantation area. • Maintain drainage channels and roads by conducting hardening of road surfaces. • Conduct counseling to the community regarding the importance of protection and preservation of land / water, protected areas and river borders. • Immediately plant land cover crops to reduce the amount of erosion and reduce the surface coefficient.	• The road, the construction of facilities and infrastructure and the locations of land clearing. • Pemahan and Demit river	• Collect data on the extent of soil and water conservation activities • Direct monitoring of soil and water conservation activities • Data analysis is done in a descriptive manner.	Every year	• PT LAP • Related agencies from the government	every year, Management and monitoring are carried out continuously.
4	Decrease in abundance and diversity of flora	• Protecting species of economic and ecological value around the study area • Make information boards that contain prohibitions on cutting down protected flora and other species at the activity site along the river border (100 m for large rivers and 50 m for small rivers), in the buffer zone and	• Conservation area. • Land clearing area.	Sampling of flora at determined points, observation in the field, collecting information from residents.	Every 6 months	• PT LAP • Related agencies from the government	Management and monitoring are carried out every 6 months

No	Monitored parameter	Proposed Enhancement/ Mitigation Measures	Location	Measurement	Frequency	Management Institution	Estimated Time-frame for completion of task
		protected areas. • Planting species of flora that are protected or ecologically valuable in river boundaries, buffer zones, protected areas during revegetation and as part of efforts to conserve soil and water. • Maintain the existence and plant the types of flora that are ecological functions for animals that are around the location of the activity. • Planting LCC after open and land clearing.					
5	Decrease in abundance and diversity of fauna	• Planting and maintaining the types of flora / vegetation that function for animals to find food, shelter and breed. • Open and clean the land in stages to give the opportunity for fauna to migrate to find new habitats. • Providing new habitat for fauna to replace damaged habitat, new habitat also serves to invite the presence of animals at the location of the activity. • Conducting a persuasive approach to encourage the communities to protect the animals around the PT LAP site, in river boundaries, buffer zones and protected areas, especially protected species and have ecological functions.	Pemahan and Demit rivers and all plantation areas.	Sampling of fauna at determined points, observation in the field, collecting information from residents.	Every 6 months	• PT LAP • Related agencies from the government	Management and monitoring are carried out every 6 months

No	Monitored parameter	Proposed Enhancement/ Mitigation Measures	Location	Measurement	Frequency	Management Institution	Estimated Time-frame for completion of task
6	Decreasing diversity of aquatic biota	• Planting and maintaining the types of flora / vegetation that function for animals to find food, shelter and breed. • Protecting the types of fish that have economic and ecological value in the location of activities by not carrying out mechanical exploitation, exploitation using poisons or other prohibited methods of exploitation (electricity or bombs). • Making information boards that contain prohibitions on taking for fish that are of economic and ecological value using exploitation methods that are harmful to environmental balance.	Pemahan and Demit River.	• Sampling of water samples at determined points, observation in the field.	Every 6 months	• PT LAP • Related agencies from the government	Management and monitoring are carried out every 6 months and continuously
7	The changes in people's perceptions and attitudes	• Conduct intensive and transparent socialization to the community at the village level and other related parties about the planned PT LAP plantation and palm oil mill activities, • Receive suggestions, demands, desires, aspirations and expectations of the community and accommodate all that is relevant. • Strengthening relations and communication and working with communities who behave and perceive accepting / positive to socialize to other communities.	Betenung, Cegolak, Batu Mas and Tanjung Beulang Village inside and around of the plantation area.	• Conducted a census on the affected communities • Field observations through direct interviews or questionnaire	Environmental management and monitoring is carried out continuously	• PT LAP • Related agencies from the government	Environmental management and monitoring is carried out continuously

No	Monitored parameter	Proposed Enhancement/ Mitigation Measures	Location	Measurement	Frequency	Management Institution	Estimated Time-frame for completion of task
8	The changes in community income	• Provide opportunities for people directly affected by plantation activities, to be able to work as employees, workers, in accordance with the qualifications and labor requirements needed. • Engagement business guidance and capital to the affected community, regarding new business opportunities, outside the agriculture and plantation sectors. • Participate in providing & completing economic infrastructure, in connection with the increase in ongoing work activities. • Providing community social assistance, in the form of scholarships, public facilities, worship and repair of rural facilities and infrastructure.	Betenung, Cegolak, Batu Mas and Tanjung Beulang Village	• Conducted a census on the communities who work with company. • Descriptive data analysis	Management and monitoring is carried out continuously	• PT LAP • Related agencies from the government	continuously
9	Work and business opportunities	• Companies prioritizing those involved in this activity are communities around the location of planned activities / businesses. • Determination of salaries for workers adjusted to the UMR or UMK (minimum regional wage) • Collaboration with community leaders, as well as ordinary people for disseminating information when companies still need labor. • Establish cooperatives to meet the needs of the surrounding community.	Betenung, Cegolak, Batu Mas and Tanjung Beulang Village	Collecting data on the number of communities who work with company.	Continuous management and monitoring.	• PT LAP • Related agencies from the government	Management and monitoring is carried out continuously

No	Monitored parameter	Proposed Enhancement/ Mitigation Measures	Location	Measurement	Frequency	Management Institution	Estimated Time-frame for completion of task
		• Participate in forming a village institution or environmental management division on the part of the initiator who is responsible for the economic growth of the community around the study area. • Coordinate with local village officials, in planning and implementing partnership programs with local communities around company.					
10	Decreasing the quality of communities health	• Providing medical assistance to communities affected by "water borne diseases" and "water borne diseases". • Management intensively, for pollutant sources that have the potential to pollute the environment to be distributed to the population area. • Managing the quality of existing air and river water to determine its quality.	Betenung, Cegolak, Batu Mas and Tanjung Beulang Village	• Conduct a census of communities about communities' health. • Data analysis is done in a descriptive manner.	Environmental management and monitoring is carried out continuously	• PT LAP • Related agencies from the government	Environmental management and monitoring is carried out continuously

4.2.2 HCV management and monitoring plan

The purpose of HCV management is to protect HCV elements and HCV areas from destruction as well as maintain and improve their value or function. The results of the threat assessment have given a choice of actions that need to be taken to minimize or reduce threats. Management and monitoring recommendations that need to be considered in preparing a complete document of the HCV Management and Monitoring Plan in the PT LAP area are presented in the following table:

HCV	Size (ha)	Threat	Management recommendation	Monitoring recommendation
1	HCV: 537.18 ha HCVMA: 577.76 ha	• Reduction of Kelempiau population due to poaching. • Fragmentation of Kelempiau's habitat. • Reduction of the quality of Kelempiau's habitat.	• Reducing opportunities for animals hunting and preparing alternatives for meeting the needs of the community / workers. • Maintain riparian buffer zone as a corridor so the habitat is not fragmented. • Maintain habitat condition, such as by establishing HCV areas and security patrol.	• Regular monitoring of the existence of Kelempiau and other RTE species. • Record any incidence of hunting and the destruction or reduction of Kelempiau's habitat.
2	HCV : 537.18 ha HCVMA: 577.76 ha	• Logging of forested areas • Fragmentation in forested areas and river borders that cut off the movement of animals (corridors)	• Collaborate with stakeholders in managing the HCV area as a joint protected area • Maintaining the integrity of forested areas as a joint commitment of the community • Security patrol • Maintain river borders as a corridor so that habitat is not fragmented	• Record every occurrence of hunting, and damage to forested areas and river borders every 3 months

HCV	Size (ha)	Threat	Management recommendation	Monitoring recommendation
3	HCV: 453.61 ha HCV MA: 493.73 ha	Logging of the remaining forested or conservation areas.	Strive to prevent illegal logging, especially in the areas that identified with high conservation value.	Regular monitoring of the condition of forested area in Lintar Hill.
4	HCV: 537.18 ha HCV MA: 577.76 ha	Extreme water flow.	• Socialization to communities around the concession regarding the boundary of HCV area and its important function. • Collaboration with communities, government (from village to district level) and also NGO that related to preservation and protection of river. • Socialization and assistance to the land clearing contractor regarding the boundary of HCV areas to prevent over-clearing.	• Documentation of socialization activities with related stakeholder. • Regular monitoring on the boundary and total area (ha) of HCV area. • Documentation of the land clearing activities.

HCV	Size (ha)	Threat	Management recommendation	Monitoring recommendation
		Water quality degradation.	• Installation of sign boards for limiting or prohibiting application of chemicals in riparian areas and socialization to spraying employees. • Implement land-based soil and water conservation activities, such as making rorak (Silt-pit) or terraces. • Application of best management practice to maintain water quality such as: maintaining riparian buffer zone, not carrying out spraying / fertilizing activities near river areas / water bodies. • Cover crop planting to minimize erosion due to surface run of. The cover crop that usually used is *Mucuna bracteata.*	• Measure the degree of sedimentation in the water quality monitoring sites. • Regular water quality checking (at least once every 6 months) at water monitoring points (river inlets), both visually and laboratory tests.
		Soil erosion, especially in slope areas.	• Enrichment of vegetation in the riparian zones and steep areas that have been degraded (enrichment is recommended with native tree species that have deep and strong roots and lush canopy). • Strengthening river cliffs (especially the one that prone to erosions and landslides) with a civil (short-term) and vegetative (long-term) approach. • Maintain the preservation of the hill area through the delineation of the area as conservation area and conducting security patrols. • Construct a clear conservation area boundary on the field and assist land clearing contractors when they clearing the land in order to prevent over clearing/ encroachment to conservation areas.	• Monitor vegetation growth (% grow). • Record the number of landslides or high erosion locations. • Conduct regular patrol on the conservation areas. • Monitor the boundary and the total areas of the HCV areas, especially when there is a land clearing activity take places. • Documenting the land clearing activities.

HCV	Size (ha)	Threat	Management recommendation	Monitoring recommendation
		Protection of land or aquifers and natural ecosystems that play an important role in stabilizing steep slopes	• Enrichment of vegetation in demarcated rivers and degraded areas (recommended enrichment with native tree species and / or having deep and strong roots, and lush canopy) • Strengthening river cliffs prone to landslides with technical (short-term) and vegetative (long-term) approaches • Maintain the integrity of the hill area through inauguration of the area and security patrols • Make clear HCV area boundaries and assist LC contractors when clearing land	• Monitor the growth of enrichment areas (% growing) • Record the number of landslides or high erosion locations • Perform regular patrols every 6 months • Monitor the extent and extent of HCV areas, especially when clearing land • Documenting the process of land clearing
5	20.1	• Illegal logging and poor land management on the water catchment areas and hills. • Illegal mining that destroy the riparian zone function by its pollutant and reduce river's water quality. • Decreased river's water quality due to domestic wastes.	• Socialization and encourage internal village to make agreements and regulations regarding the maintenance and utilization of riparian zone and river water. • Encourage enrichment or reforestation of the riparian zone or water catchment areas by planting jungle tree species that has environmental benefit and economic value. • Encourage internal village party to create village rules or village regulation in the usage and the maintenance of rivers. • Encouraging internal village party and surrounding companies to form a monitoring team for the riparian zone and the streams.	• Documentation of the socialization and feedback from internal staff and Village team. • Monitoring the compensation process according to company procedures. • Monitoring vegetation growth. • Record the number and the location of landslides incident and erosion prone. • Conduct regular patrol. • Monitoring of the boundary and size of the HCV areas, especially during land clearing activities and documenting land clearing activities.

HCV	Size (ha)	Threat	Management recommendation	Monitoring recommendation
6	Indicative	• Pressure from villager to compensate the "Pedasahan" and fields areas. • The loss of the old tomb which is feared to be conflict.	• Socialization to the surrounding community regarding the plans for Kas Desa development is clearly based on the rules of FPIC. • Provide standard knowledge and procedures to internal staff in the field and the implementation team of the village.	• Documentation of the socialization and feedback from internal staff and the implementation team of the village. • Monitoring of the compensation process in accordance to company procedure.
		• The “Menuba” tradition in Pebihingan Village conducted in Pemahan River.	• Encourage internal village Party to form a monitoring team to monitor the riparian zone and stream. • Socialization of the HCV and the importance of river. • Encourage the village official to prohibit the “Menuba” activity on the river.	• Documentation of socialization and feedback from internal and external staff of the village. • Monitoring the utilization of the river.
HCS	189.35	• Illegal logging on the high carbon stock areas. • Land and forest fire, both due to natural causes or due to land clearing activities conducted by the local community. • Land conversion to community’s cultivated land (shifting agriculture).	• Conduct boundary marking of the HCS area especially for all HCS areas which do not overlap with HCV areas. • Installation of information sign board related the existence of HCS areas. • Identification of threats to the HCS areas such as land encroachment, logging, hunting, burning and other threats. Also identification of the mitigation action needed. • The development of social program that involve the participatory protection of conservation areas with the local community. • Tree planting and re-vegetation program using local species to improve the species biodiversity and restore disturbed HCS area.	• Determination of sampling plot for HCS monitoring. • Regular patrol every month, adjusted to the level of threats that exist.

HCV	Size (ha)	Threat	Management recommendation	Monitoring recommendation
			• Capacity building of the management team (sustainability) in managing and monitoring the conservation areas. • Cooperate with BKSDA to conduct socialization to the local community regarding the conservation regulations or law, such as prohibiting hunting (shooting, poisoning, trapping, blasting, etc.), burning land and logging in conservation areas ect.	

4.2.3 Soil management plan

Based on the soil survey, there is no marginal soil in the proposed development areas. Considering the topography the proposed development areas, the areas that need attention and managed are the steep areas and riparian zone because both of those areas are prone to erosions. Management plan that need to be considered in preparing a complete document of the soil management plan in the proposed development areas are presented in the following table:

No	Location	Threat	Management recommendation	Monitoring recommendation
1	Steep areas	• Erosion. • Landslide. • Pollution to water body • Nutrient loss	• Conduct topography survey to map areas with slope more than 25 degree and map them for conservation. • Implement best management practice for steep areas, includes: - Construct terrace on the steep areas. - Construct stop bund to retain water. - Construct road side silt pit to collect water. - Construct retaining wall made from sand sack to repair the areas that have been eroded. - Plant cover crop to reduce erosion by surface run off.	• Land cover monitoring • Water quality monitoring and test
2	Riparian zone	• Erosion • Pollution to water body • Vegetation loss	• Planting jungle tree species. • Planting cover crops. • No spraying near the river.	• Survival rate monitoring of the planted seeds. • Land cover monitoring

4.2.4 Green house gas management plan

PT LAP will implement several measures which would assist in minimizing GHG emissions from oil palm cultivation & processing:

No	Threat	Management recommendation	Monitoring recommendation
Measures taken to maintain and enhance carbon stocks within the new development areas			
1	• Emission from land use change. • Emission from fire incident.	• Ensure that the identified and assigned HCV areas are conserved and in a well managed state so that their HCV functions are well preserved. • Enhance the administration of the management and monitoring in the sense that the process is carried out more systematically according to RSPO and the legal procedures. • Continue the management and monitoring system of the HCV area that had been put in place in PT LAP to the expansion areas. • Periodical review of the efficacy of the management and monitoring efforts. Improvement opportunities to the existing system when available will be pursued vigorously.	• Threats monitoring on the conservation areas. • Fire monitoring. • Land covers monitoring. • Wildlife monitoring • Water quality monitoring.
Measures that will be taken to mitigate net GHG emissions associated with oil palm cultivation and processing in the new development			
1	• High emission from palm oil mill effluent (POME) • Emission from fossil fuel used in operation.	• Construction of methane captures system as soon as PT LAP has commission its palm oil mills. This methane captures system will generate electricity which greatly reduced the GHG emission from palm oil mill effluent (POME) treatment.	• GHG emission calculation • Fuel consumption monitoring • Fertilizer monitoring • Fire monitoring

No	Threat	Management recommendation	Monitoring recommendation
	• Emission from fertilizer used.	In addition, excess electricity generated by the methane capture system was sold to the national grid generating emission credits. • Installation of an aerobic treatment system to augment the emission reduction from methane captures system. • Switching fuels used in fruit transports and generator sets from fossil diesel to biodiesel. Biodiesel has zero GHG emission. • Utilization of decanter solid in the plantation to compliment inorganic fertilizer. • Improvement in harvesting logistics to optimize the use of PME. • Implementation of zero burning policy. • Maintain high carbon stock areas.	

4.2.5 Social Management Plan

No.	Program	Issues	Target	Strategy	Output	Monitoring	PIC
1	CD and CSR program	- The community's cash income source is very limited on rubber commodity and field yield in general. - Reduced area of community farming - The farming activity in PT LAP location area has a risk of fire occurrence on oil palm plantation; thus, becomes an extra thing for the company. - The government's ban on shifting cultivation with fuel system - Unproductive field management - Potential natural resources have not been managed properly. - Community dependence on the company is extremely high in terms of CSR assistance and employment.	Increasing the cash income of the surrounding community and the variety of sources of income, so as to reduce dependence on the company	Empowering the surrounding community through CD and CSR programs that focus on the business development program of surrounding community to get cash through community participation and mutually beneficial cooperation, such as: - **Agriculture sector:** A land making which has a potential to be used as permanent paddy rice farming with intensive management to reduce the need for shifting fields. - **Fisheries sector:** Potential river water resources around residential areas can be used to make ponds around the left and right sides of the river or potential places for intensive aquaculture ponds. - **Animal husbandry sector:** The abundance of forage for animal feed available in the oil palm plantation area can be used for livestock	Cash income increase of the surrounding community and variety of income sources available; thus, can reduce dependence on the company	Development Report based on activity	Public relation follow up SEM

		- The CD/CSR program has not touched the community's economic aspect. - The CSR program distribution is not even		cultivation with a cage system such as goat and cow, also animal manure can be used for organic fertilizer and the garden area can be maintained since the grass is utilized. - **Home industry sector:** A development of oil palm plantation sector and the livelihoods of the people as field and garden farmers, a potential to develop the blacksmith household handicraft industry that makes equipment such as hoes, sickles, dodos, goad, machetes, spray tanks, etc.			
2	Communication, Safety and Security	Communication, safety and security systems/institutions have not yet been established between PT LAP and surrounding communities, also the absence of a participatory conflict management plan.	Able to do prevention or mitigation against problems that might occur in the future.	Safety and security communication systems between the community and plantations are needed in anticipating emergency conditions, for the reason, it is necessary to initiate the formation and agreement between UP and surrounding community.	Prevent or mitigate problems that may arise in the future	Developme nt Report based on activity	Public relation follow up SEM

3	Cooperatives and Farmer Groups	The human resources of the surrounding community in general are still relatively low/lacking and do not have experience in managing cooperatives or farmer groups. Problems often occur in managing cooperatives or farmer groups in many places, mainly in financial management.	The improvement of cooperation/farmers group HR's knowledge and skill, therefore; cooperation or farmers group management could be improved	Conduct management coaching against cooperatives or farmer groups and their supervision	Increasing the knowledge and skills of cooperative human resources so that they can improve the management of cooperatives or farmer groups.	Developme nt Report based on activity	Public relation follow up SEM
4	Human Resources and Employment	There are no labor unions in each management unit	Labor union formed which representatively represents the entire employees in each work unit.	- The company facilitates the formation by helping each work unit to send representatives to participate in the formation of a work team to form a labor union - Assists and supports work team to form board of management draft - Determine chairman with management structure and socialize it to all employees	The formation of representative labor unions representing all employees in each work unit	Developme nt Report based on activity	Public relation follow up SEM
5	Health, Work Safety and PPE	- Replacement of damaged or improper PPE is often late - Employees have not consistently used PPE	Health, safety and security conditions of the workers are more guaranteed.	- PPE work equipment and work uniforms - To always use PPE at work to reduce risks - To make sure PPE has been allocated to all workers based on the needs of each work unit	Health, safety and security conditions of the workers are more assured	Developme nt Report based on activity	K3 Staff follow up EM/SEM

				- To conduct briefings routinely about the importance of PPE during work - Conduct a monitoring routinely accompanied by written reprimand if one is negligent			
6	Housing and Supporting Facilities	There is no place of worship	A safe, comfortable, beautiful and harmonious housing condition, as well as housing management which are not always dependent on PT. Lestari Abadi Perkasa.	- Providing places of worship (such as musholla, chapel) or agreed place as a means of worship - Reviewing and identifying safety, sanitation and cleanliness, fine conditions in managing the entire houses inside the company environment - Forming a communication system and place between UP PT LAP and employees - Sanitation and cleanliness in each house - Sorting domestic waste, no stacking and adequate garbage collection.	A peaceful, beautiful, cozy and safe housing condition, as well as a housing management which is not always depend on UP PT LAP	Monthly Development Report	EM follow up SEM
7	Transportation facilities and infrastructure	The absence of special transportation or vehicles in picking up workers	The safety and security of the workers is more guaranteed and plantation management activities run well	Provide special shuttle vehicles for workers	The safety and security of workers is more guaranteed and garden management activities run well		EM follow up SEM

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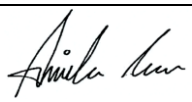
6. Internal responsibility

6.1 Formal signing off (with date) by assessors and grower.

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

Assessment	Name of Lead Assessor	Signature
High Conservation Value Assessment (HCV)	Sigit Budhi Setyanto	
Social Environmental Impact Assessment (SEIA)	Zailani	
Land Use Change Analysis (LUCA)	Amirul Ikhsan	
High carbon Stock Assessment (HCSA)	Cecep Saepuloh	
Greenhouse Gas Analysis	Dr. Gan Lian Tiong	
Social Impact Assessment	Herry Triyana	

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

This document is the public summary of the integrated SEIA, HCV & HCS management for new developments at PT LAP Ketapang and has been approved by management.

Periannan Chellamuthu Senior General Manager	Date : 28th June 2019
	
Dr. Gan Lian Tiong Director of Sustainability	Date : 28th June 2019
	

6.3 Organizational information and contact persons.

Company Name	: PT Lestari Abadi Perkasa
Deed of Establishment	: Notary Hustiati, SH, No: 83 dated on 25th September 2006
Adjustment Article of Association	: Notary Lili Suryati, SH, No: 66, dated on 30th October 2015
Capital Status	: Domestic Investment (Penanaman Modal Dalam Negeri, PMDN)
Taxpayer Notification Number	: 02.528.801.0 – 112.000
Company Address	: Spring tower 01 – 16, Jl. KL. Yos Sudarso, Tanjung Mulia, Medan Deli Kota Medan 20241
Type of business	: Oil Palm Plantation & Processing
Contact person	: Periannan Chellamuthu (periannan.chellamuthu@musimmas.com)

6.4 Personnel information involved in planning and implementation.

1. Periannan Chellamuthu (Senior General Manager PT LAP)
2. Dr. Gan Lian Tiong (Director of Sustainability)
3. Nico (Senior Estate Manager)
4. Burhan Sanjaya (Estate Manager of PT LAP)
5. Syaffrudin (Public Relation Manager)
6. Budi Triprasetia (Manager of Sustainability)
7. Windu Iriayanto (Staff of Sustainability)