Nugum Lunang, Lelum Tano'

Sustainable Forest, Safe Earth

Sustainable Forest and Biodiversity Management in Dayak Punan Long Adiu Customary Community Territory, Malinau, North Kalimantan, Indonesia

Project Design Document

Submitted to the Plan Vivo Foundation by *Lembaga Pemerhati dan Pemberdayaan Dayak Punan Malinau* (LP3M)

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Acronyms

AA-CFREDD	Plan Vivo Approved Approach for Estimation of Climate Benefits from REDD in Community Managed Forests
ADB	Asian Development Bank
AMAN	*Aliansi Masyarakat Adat Nusantara*
AR	Annual Report
Bappeda	District Planning Agency (*Badan Perencanaan Pembangunan Daerah*)
BPD	Village Consultative Body (*Badan Permusyawaratan Desa*)
BPWA	Dayak Punan Long Adiu Customary Territory Management Body (*Badan Pengelola Wilayah Adat Dayak Punan Long Adiu*)
CSR	Corporate Social Responsibility
DESCA	Directorate of Ecosystem Services on Conservation Areas
FPIC	Free, Prior and Informed Consent
GIS	Geographic Information System
GPS	Geographic Positioning System
IUCN	International Union for the Conservation of Nature
LP3M	*Lembaga Pemerhati dan Pemberdayaan Dayak Punan Malinau*
LPM	Community Empowerment Institution (*Lembaga Pemberdayaan Masyarakat*)
MoEF	Ministry of Environment and Forestry (*Kementerian Lingkungan Hidup dan Kehutanan*)
NDC	Nationally Determined Contribution
NTFP	Non-Timber Forest Products
PACT	The Punan Adiu Customary Community Territory
PDD	Project Design Document
REDD	Reducing Emissions from Deforestation and Forest Degradation
RSPO	Round Table on Sustainable Palm Oil
SLPP	*Simpul Layanan Pemetaan Participatif*
SMART	Spatial Monitoring and Reporting Tool
UNFCCC	United Nations Framework Convention on Climate Change

Contents

Executive Summary

The *Nugum Lunang, Lelum Tano'* (Sustainable Forest, Safe Earth) project will enable the Punan Adiu Customary Community to protect forest within their customary territory from deforestation and forest degradation that is expected if the activities of timber, mining and oil palm concessions are not prevented.

The Punan Adiu Customary Community Territory (PACT) covers a total area of 17,415 ha, 97% of which is covered by dipterocarp forest that supports the livelihoods of the 32 households in Punan Long Adiu Village, and provides habitat for a diverse assemblage of plant and animal species. The customary rights of the Punan Adiu community to the PACT are recognised by all neighbouring communities, and the Punan Adiu Community are in the process of applying for formal recognition of the area as Customary Forest (*Hutan Adat*).

Much of PACT is currently under concession to timber, mining and oil palm companies; and the Punan Adiu community plan to prevent the activation of these concessions. In Malinau District between 2005 and 2016, around 2% of the forest types present in PACT were deforested and around 6% was degraded. If it is not effectively protected, a similar proportion of deforestation and degradation is expected in PACT, as it is exposed to the same drivers of deforestation and degradation that have affected similar forest types in the District of Malinau over the last 10 years. Under this baseline scenario, emissions from loss of above- and below-ground biomass in the PACT between 2018 and 2022 are estimated at 458,560 tonnes of CO_2.

Over the last two years, the Punan Adiu community have worked with LP3M to develop a suite of activities that will enable them to address the drivers of deforestation expected to affect the PACT, and prevent deforestation and forest degradation. Key to the success of the activities is formal recognition of the Punan Adiu Customary Community Territory, as this will strengthen the formal repudiation of destructive and degrading activities by outside parties, including logging, mining and oil palm companies, but also illegal hunting and land conversions on their territory by individuals. The Punan Adiu community have started the process required for recognition of the PACT as customary forest (*Hutan Adat*), and will continue to pursue this with support from LP3M and the Plan Vivo project.

Customary rights of the Punan Adiu community to the PACT are recognised by all neighbouring villages and communities, and while the process for legal recognition of the customary forest is underway, the community will proceed with the development of village regulations and forest management plans to ensure sustainable management of the forest,

and initiate a programme of forest patrol and monitoring to enable them to identify and respond to threats to the forest and biodiversity.

The Punan Adiu community depends on the PACT for almost all of its livelihood activities and, through the project, it will continue to develop and diversify these activities by exploring the potential for fish farming and ecotourism, planting species used as timber and non-timber forest products, and developing new approaches for rattan processing and handicraft production and marketing. These activities, supported by the Plan Vivo project, will help to ensure the Punan Adiu community can maximise the benefits they receive from forest protection, and develop a foundation for long-term management after the end of the Plan Vivo project.

If the project activities achieve their objectives, carbon dioxide emissions from deforestation and forest degradation will be reduced; habitat for a diverse range of plant and animal species, many of which are threatened or endangered, will be protected; and the livelihoods and wellbeing of the Punan Adiu community will improve. To estimate the emission reductions, the project will achieve in its first 5-year project period, it is conservatively assumed that project activities will prevent 75% of the emissions expected from loss of above- and below-ground biomass (see Section G.5).

The main causes of the expected deforestation and forest degradation in the absence of project activities are the activities of commercial timber, mining and oil palm concessions. In the District of Malinau, all land designated for logging, mining and oil palm has been allocated. Avoidance of logging, mining and oil palm expansion within the PACT is therefore not expected to result in an increase in these activities outside the project area, so no significant leakage is expected. A conservative estimate of potential leakage of 5% of the expected emission reductions is adopted for the first project period (see Section G.6).

The Punan Adiu community have a strong commitment to forest protection and the desire to preserve forest resources for the use of future generations. The Plan Vivo project will also be used to increase income from sustainable forest management activities, and any income from the sale of Plan Vivo certificates that exceeds project implementation and management costs will contribute to a fund to be used to finance long-term forest protection and village development activities. The emission reductions achieved during the project period are therefore expected to be maintained well beyond the life of the Plan Vivo project, and the risk of reversals is low. It is acknowledged that unexpected events could affect the project area and effectiveness of project activities however, and 15.5% of the Plan Vivo certificates issued during the first project period will be held as a risk buffer against under-delivery during the project period and reversals after the end of the project (see Section H).

After accounting for the expected effectiveness of project activities, potential for leakage, and the risk buffer; during the first 5-year project period, **production of saleable Plan Vivo certificates, for 55,216 tonnes of CO_2 emission reductions per year are expected.**

Achievement of these emission reductions, and the associated benefits to biodiversity and livelihoods, will be tracked during the project period with activity-based indicators designed to demonstrate that project activities are being carried out as described in the management plan (see Section K.1.1), and that progress towards legal recognition and development of new livelihood activities is being made. Information on biodiversity, threats to biodiversity, and drivers of deforestation and forest degradation will be gathered by forest patrol and monitoring teams (see Sections K.3 and K.4); and socio-economic impacts of the project will be assessed with an annual participatory wellbeing assessment (see Section K.2). All monitoring data collected during the project period will be reviewed by LP3M every three months and used for adaptive management to revise project activities as appropriate. Emission reductions achieved will be verified at the end of the project period with an analysis of remote sensing data to determine the amount of deforestation and forest degradation that occurred within the project area, relative to deforestation and degradation of areas of the same forest type in Malinau District (see Section K.1).

By helping the Punan Adiu community to secure tenure and rights; prevent activities of timber, mining and oil palm companies; and implement sustainable forest management activities; the Plan Vivo project has potential to generate significant emission reductions, prevent degradation and loss of habitat for a diverse internationally significant assemblage of tropical forest species, and help improve and secure the livelihoods of the Punan Adiu community. It is hoped that this project will provide a model that can also be followed by other Punan communities in the region.

A. Aims and objectives

A.1 Description of project's aims and objectives

A.1.1 Problem the project will address

Nugum Lunang, Lelum Tano' (Sustainable Forest, Safe Earth) is the motto adopted by the Dayak Punan Adiu Customary Community who have a strong commitment to protecting forest within their customary territory. The Punan Adiu Community Customary Territory (PACT) covers 17,415 ha of dryland forest. Forest in the PACT and the biodiversity and ecosystem services it supports are threatened by logging, mining and oil palm concessions, as well as wildlife poaching and unsustainable extraction of Non-Timber Forest Products (NTFPs). The Punan Adiu community is a forest dependent community that relies on the forest in their customary territory to provide food, building materials, and a source of water. Degradation and loss of forest in the PACT therefore threatens the food security, water supply, and livelihoods of all community members[1].

A.1.2 Aim and objectives

The project aims to prevent deforestation, degradation and loss of wildlife in the PACT.

To achieve this, the project will support the Punan Adiu community to:

- Further solidify the legal rights to managing their customary territory;
- Develop and implement village regulations and sustainable forest and biodiversity management plans for the PACT;
- Prevent logging, mining and oil palm expansion within the PACT;
- Reduce wildlife poaching and unsanctioned timber and NTFP extraction and land conversions within the PACT; and
- Increase income from activities that do not result in deforestation and forest degradation.

[1] Damayanti, E. K. and Berry, N.J. 2016 Problem Tree Analysis for Punan Long Adiu Village. Sustainable Forest and Biodiversity Management in Borneo Project Report.

B. Site Information

B.1 Project location and boundaries

B.1.1 Location

The proposed protect area is the customary territory (or *wilayah adat*) of the Punan Adiu Customary Community (*Masyarakat Adat Punan Adiu*). The Punan Adiu community inhabit Punan Long Adiu Village in Malinau Selatan Hilir Sub-district, Malinau District, North Kalimantan Province of Indonesia.

Punan Adiu community claim an area of 17,415 ha as their customary territory. Participatory mapping of this customary territory was conducted between 2012 and 2015, in a process that involved representatives of all customary groups and villages within and surrounding the PACT. The location of the PACT is shown in Figure 1. The PACT boundary in relation to local villages, roads, and rivers is shown in Figure 2.

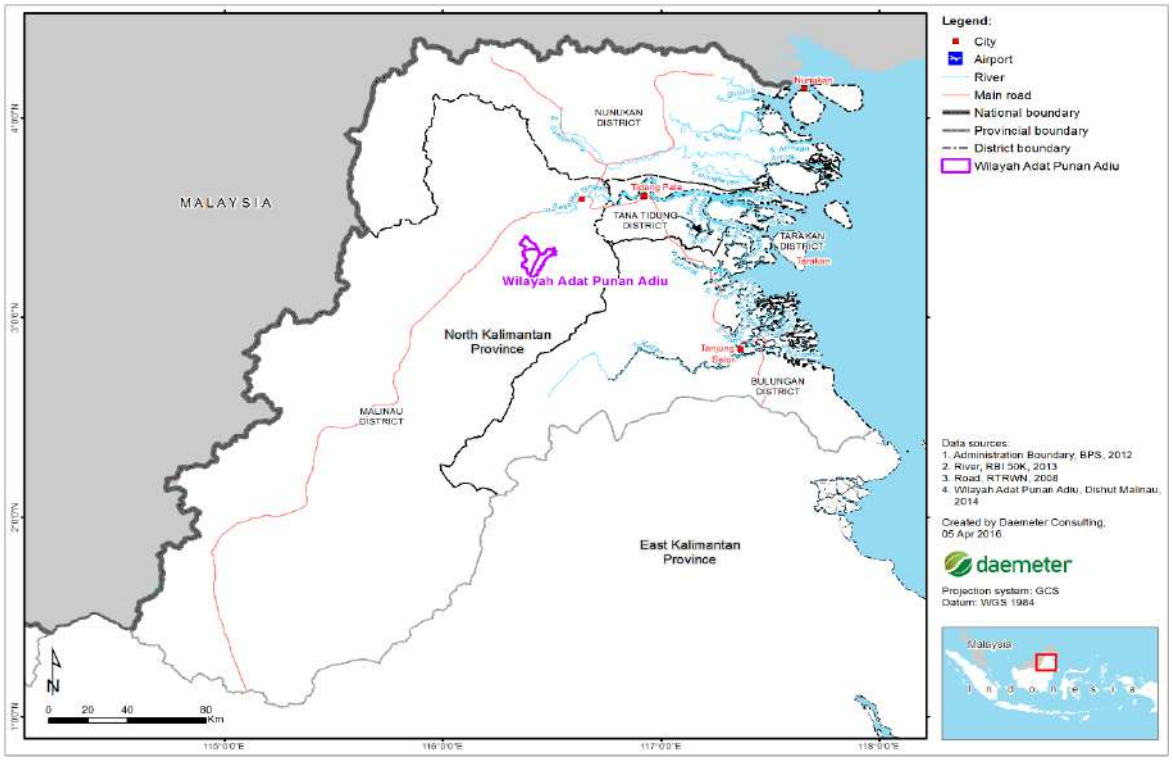

Figure 1 Location of Punan Adiu Community Customary Territory (*Wilayah Adat Masyarakat Punan Adiu*) within North Kalimantan Province

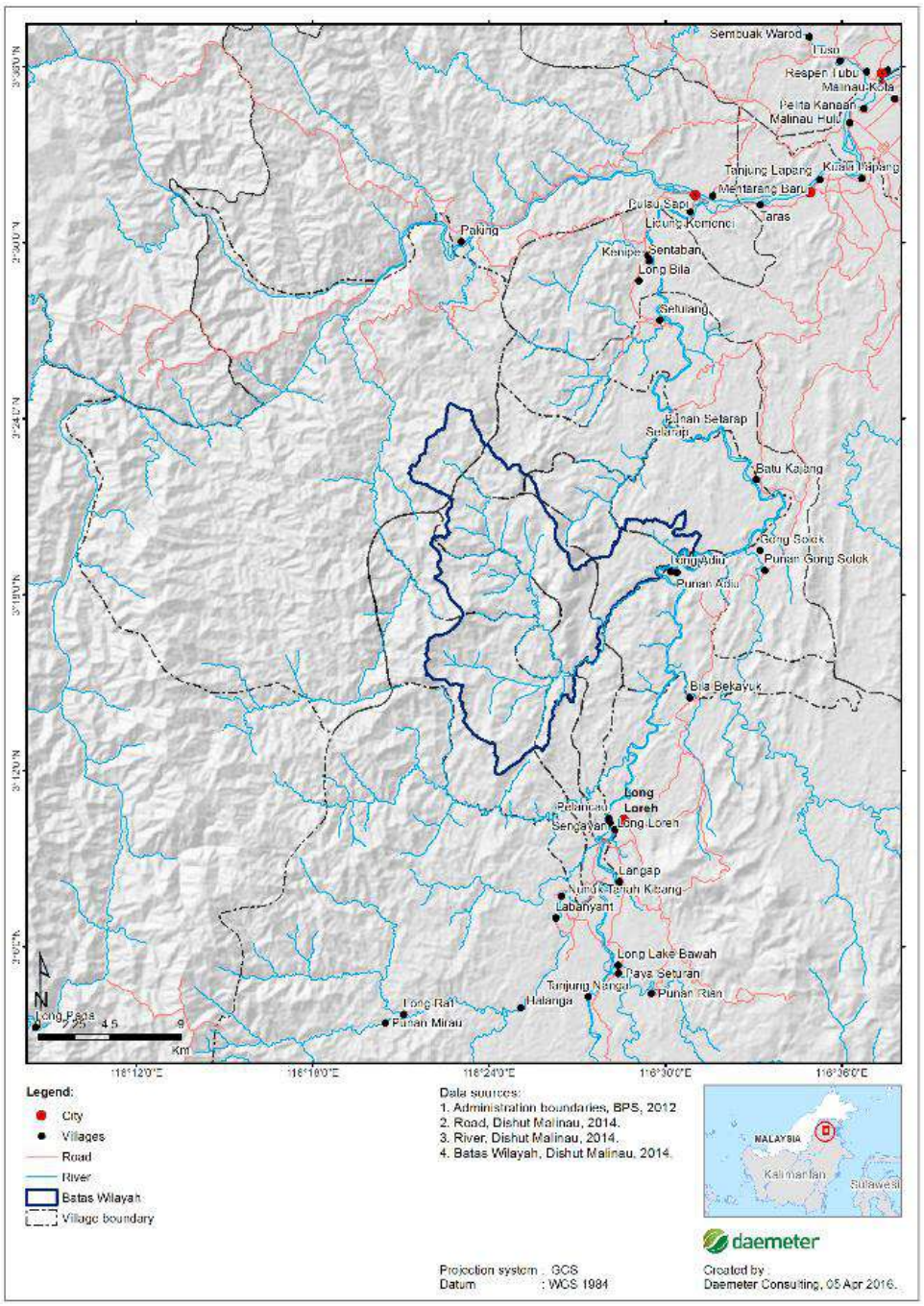

Figure 2 Boundary of Punan Adiu Community Customary Territory as described through participatory mapping by communities and customary leaders in Punan Long Adiu and surrounding villages, with the support of *Lembaga Pemerhati dan Pemberdayaan Dayak Punan Malinau* (LP3M), *Simpul Layanan Pemetaan Participatif* (SLPP), and *Aliansi Masyarakat Adat Nusantara* (AMAN).

B.2 Description of the project area

B.2.1 Geophysical description

The PACT has an undulating topography with an elevation that ranges from 100 to 1000 m.a.s.l. Only 5% of the area is flat (0-8%), while 65% has 8-40% slope and 30% of the area has more than 40% slope[2]. PACT has the following geological characteristics: sandstone bluish grey to greenish, fine to medium grained, formed by quartz, feldspar, mica and containing small rock fragments; intercalated with argillites and shale, locally breccia and conglomerate[3].

Land cover of PACT consists of 50% primary dryland forest (*Hutan Lahan Kering Primer*); 47% secondary dryland forest (*Hutan Lahan Kering Sekunder*), 2% mixed dryland farming (*Pertanian Lahan Kering Campur*), and the remaining is settlement (*Permukiman*) and water (*Air*)[4]. A 2013 land cover map for the PACT is shown in Figure 3.

[2] United States Geographical Society (USGS) 2014. SRTM 30m
[3] National Geology Agency (NGA) 2012 Geology Spatial Data
[4] Ministry of Environment and Forestry (MoEF) 2013 Landcover Spatial Data

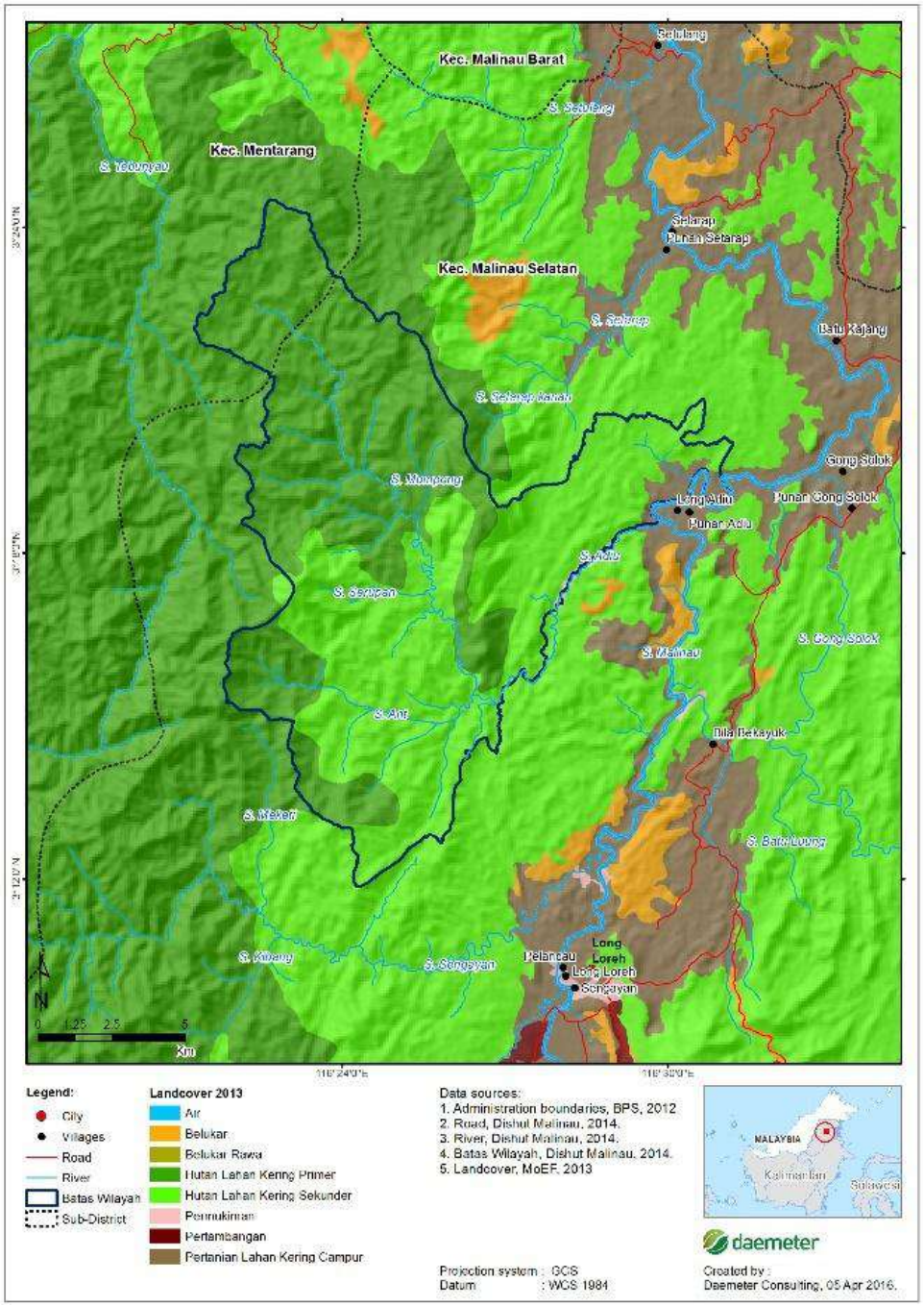

Figure 3 Land cover in and around the Punan Adiu Community Customary Territory (MoEF 2013).

B.2.2 Endangered species and habitats

The presence of plant and wildlife species of conservation interest within the PACT, and the occurrence of features with High Conservation Value, were assessed through a household survey[5] and participatory biodiversity assessment[6]. The results are summarised below.

Plant and wildlife species

Forest within the PACT supports a diverse assemblage of plant and wildlife species that are important not only for local community livelihoods but also for the global community. At least two tree species that occur within PACT are listed as vulnerable by the IUCN – Agarwood (*Aquilaria* spp.) and Ironwood (*Eusideroxylon zwageri*).

Of the wildlife species that were reported to make use of the PACT, 130 are listed in the IUCN Red List of Threatened Species[7] (see Table 1). Of these 3 are critically endangered – Helmeted Hornbill (*Buceros vigil*), Sunda Pangolin (*Manis javanica*), and Bornean Banded Langur (*Presbytis chrysomelas*); and 8 are endangered - White-rumped Woodpecker (*Meiglyptes tristis*), Straw-headed Bulbul (*Pycnonotus zeylanicus*), Otter Civet (*Cynogale bennettii*), Agile Gibbon (*Hylobates agilis*); Müller's Bornean Gibbon (*Hylobates muelleri*); Hairy-nosed Otter (*Lutra sumatrana*), Flat-headed Cat (*Prionailurus planiceps*), and Smoky Flying Squirrel (*Pteromyscus pulverulentus*).

Table 1 Summary of threatened plant and wildlife species reported to occur within PACT

	IUCN Red List Status*				
	CR	EN	VU	NT	LC
Plants			2		
Birds	1	2	5	20	50
Mammals	2	6	21	8	13
Reptiles					2

* CE = Critically Endangered, EN = Endangered, VU= Vulnerable, NT = Near Threatened, LC = Least Concern. Source: Participatory Biodiversity Assessment 2016

[5] Damayanti, E. K. and Berry, N.J. 2016 Livelihood and Socioeconomic Survey, Punan Long Adiu Village. Sustainable Forest and Biodiversity Management in Borneo Project Report.
[6] Damayanti, E.K., Hanjoyo, and Berry, N.J. 2016. Participatory Biodiversity Assessment for Punan Adiu Customary Community Territory. Sustainable Forest and Biodiversity Management in Borneo Project Report.
[7] The IUCN Red List of Threatened Species. Version 2016-3. Retrieved from www.iucnredlist.org on December 25, 2016.

High Conservation Values

High Conservation Values (HCV)[8] associated with the PACT that were identified by Punan Long Adiu community members are summarised in Table 2.

Table 2 High Conservation Values (HCV) associated with the Punan Adiu Customary Community Territory (PACT).

HCV Category	Details
HCV 1 - Biodiversity	At least two vulnerable tree species, and 130 threatened wildlife species (see previous section).
HCV 2 – Landscape-level ecosystems and mosaics	The PACT is an expanse of relatively intact dipterocarp forest, with small patches used for shifting cultivation (see Section B.2.1).
HCV 3 – Rare, threatened or endangered ecosystems	Within the PACT there are a number of salt-water ponds where wildlife gathers. These rarely occurring ponds also attract hunters and are an important focus for conservation efforts.
HCV 4 - Ecosystem services in critical situations	Adiu River provides clean and unpolluted water during dry season as well as fresh water fish for consumption. Unfortunately, the Malinau River that also flows through the PACT is thought to be polluted by upstream coal mining meaning it is no longer possible to consume the water or catch fish from this river.
HCV 5 – Provision of basic needs	The Punan Adiu community depend on forest within the PACT to provide food, water, medicine, wood, NTFP (rattan, medicinal plants, fruits, other NTFPs), wildlife, etc. For many of the households, the forest is their only source of livelihoods.
HCV6 – Cultural importance	The PACT includes a number of sites of cultural importance, including: • *Tabau Jayan* – a legendary site on the top of mountain (a pond with mystical fishes) • *Gunung Bintang* – a legendary cave where a mystical tiger exists • An ancestral cemetery • *Sungai Bambu* – ex-settlement of Punan Adiu Customary Community that has become a sacred site and is visited during certain customary festivals • *Sigong Kelafang* – a border between Punan Long Adiu and Setarap Villages, where there is a waterfall, many fishes and freshwater turtles

Source: Livelihoods and Socioeconomic Survey 2016

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

B.3 Recent changes in land use and environmental conditions

B.3.1 Current land use

To describe current land use within PACT it is important to consider the legal designations in the MoEF Spatial Plan[9] (Figure 4), which show that 42% of PACT is limited production forest (*Hutan Produksi Terbatas*); 38% is other use area (*Area Penggunaan Lain*); and 20% is protection forest (*Hutan Lindung*). Most of the PACT, with the exception of the area classified as protection forest, is currently under licence to logging, mining and oil palm concessions (see Figure 5).

[9] Ministry of Environment and Forestry (MoEF) 2014 Minister of Environment and Forestry Decree No. 733, 2014

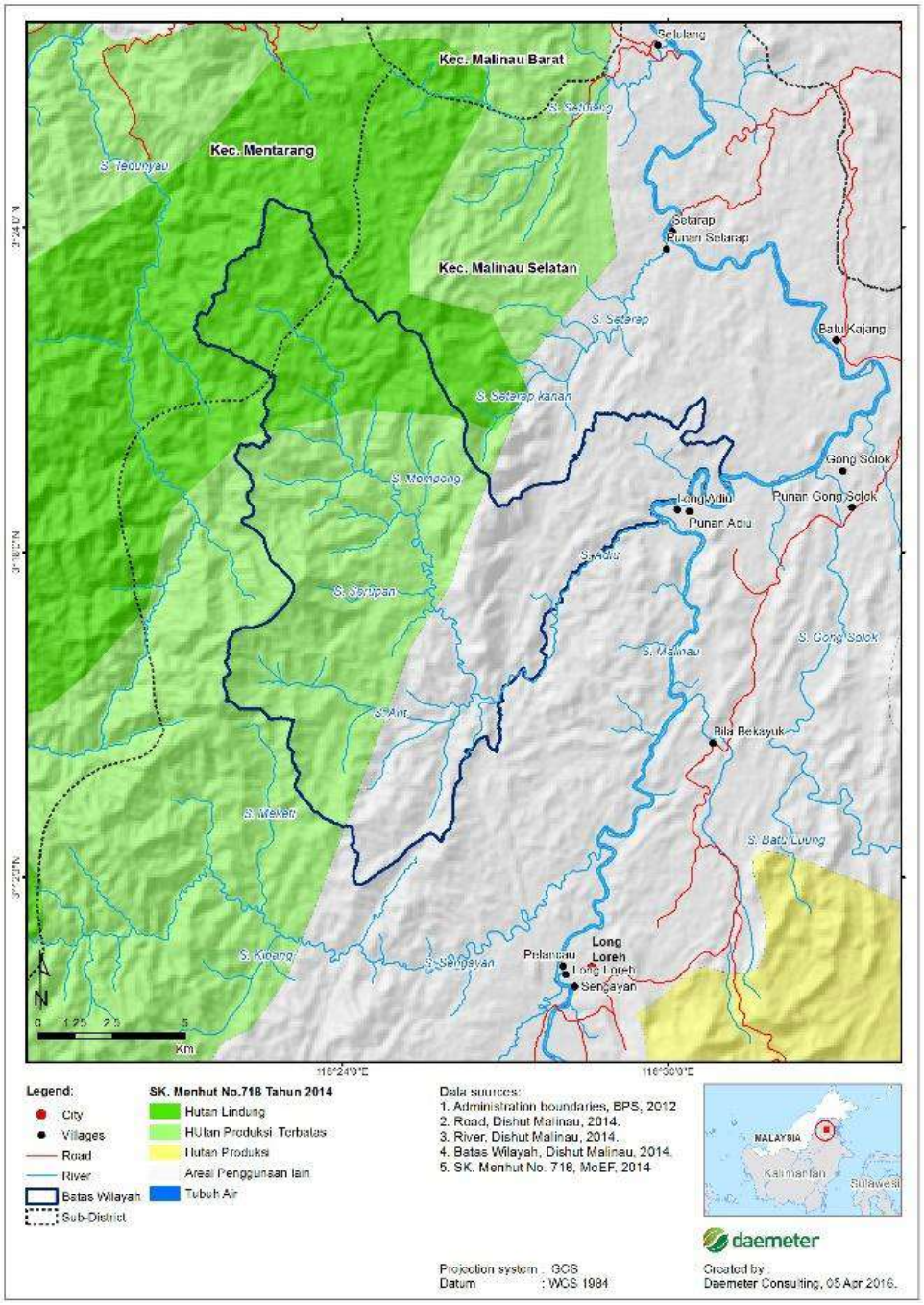

Figure 4 Designation of land within the Punan Adiu Community Customary Territory according to the Ministry of Environment and Forestry (2014) Forestry Spatial Plan

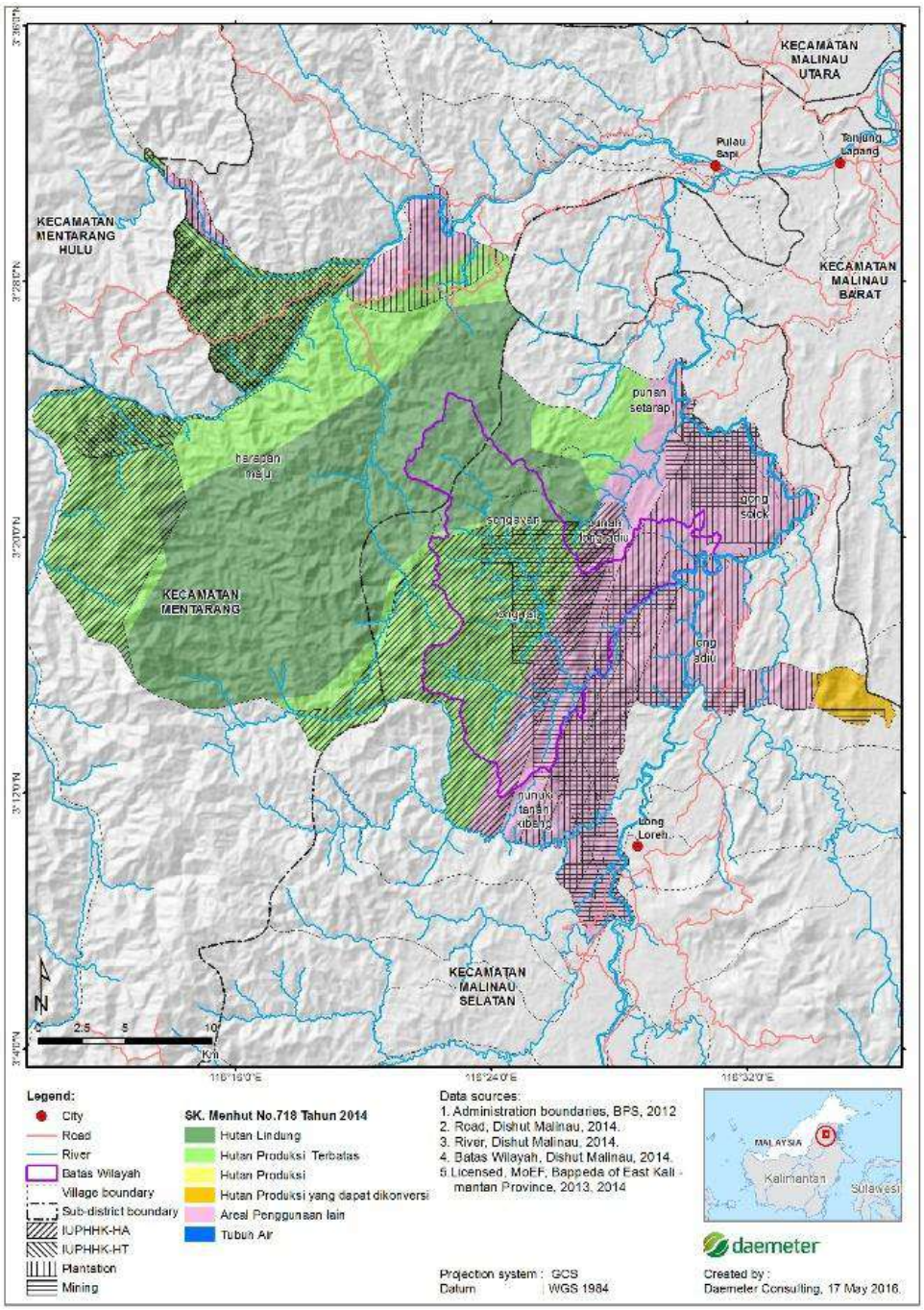

Figure 5 Area of Punan Adiu Community Customary Territory that is covered by timber, mining, or plantation licenses.

It is also important to consider how land within the project areas is currently used by the Punan Adiu community and other local communities. A participatory land use mapping exercise[10] was therefore conducted to provide information about land use activities carried out inside PACT. Forest by the Punan Adiu community is both determined by and helps to

[10] Suryadi, I et. al. 2017. Participatory Land Use Mapping: Punan Adiu Customary Community Territory. Sustainable Forest and Biodiversity Management Project Report.

determine land cover. Table 3 describes the land use and land cover classes used by the community to describe land within their customary territory. Figure 6 shows the location of these land use and land cover classes as described by the community, and verified with ground-truthed satellite imagery.

Table 3 Land use and land cover classes in PACT described by Punan Adiu Community

Land use type	Description
Dryland Agriculture, Plantation, Jakau	Area used for shifting cultivation comprised of a mosaic of open fields, fallow areas, and tree plantations
Tano' Jakah	Degraded forest used for hunting, fishing and NTFP collection
Tano' Legaman	Primary forest used for hunting fishing and NTFP collection
Total	

Source: Participatory Land Use Mapping, 2017

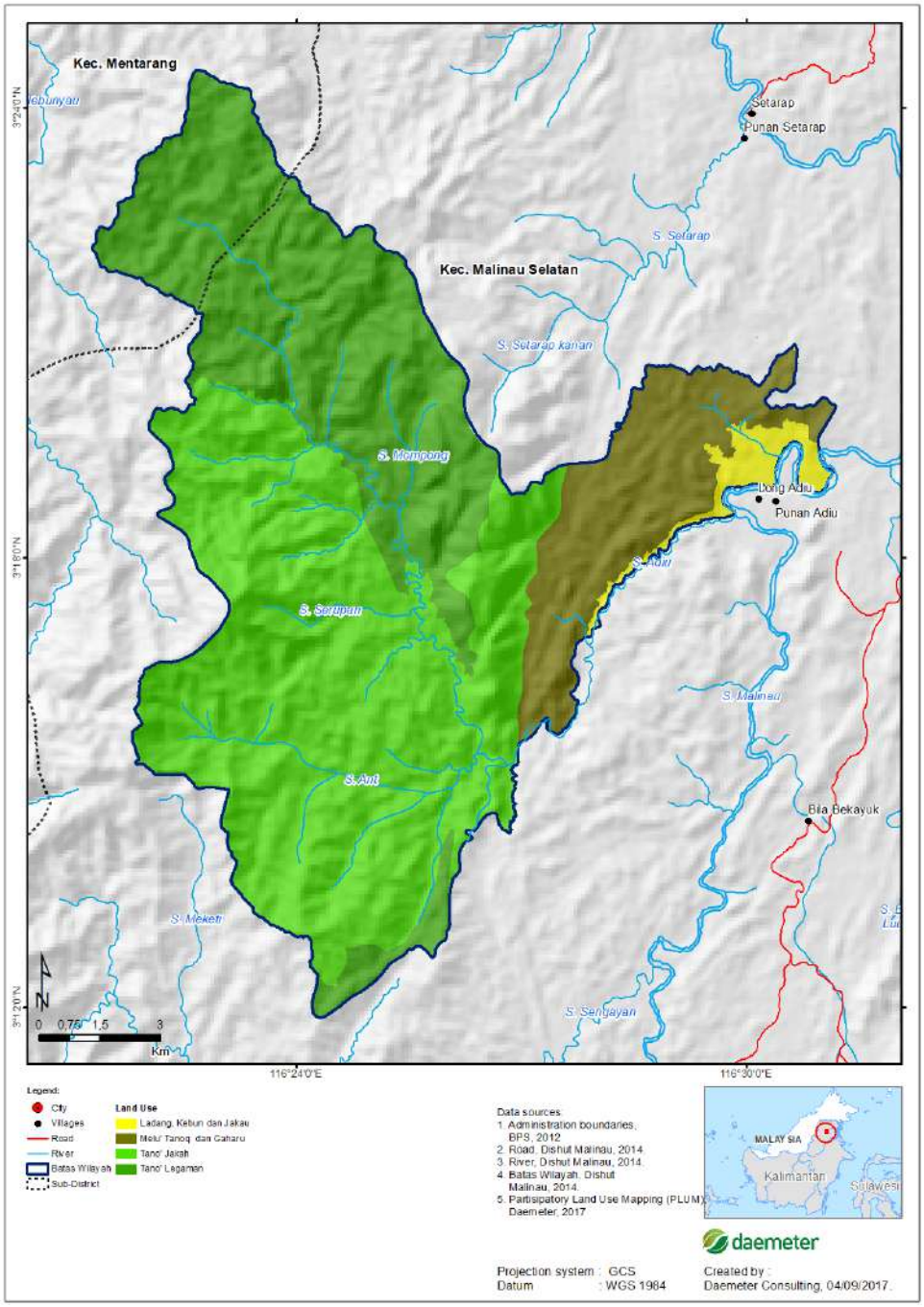

Figure 6 Participatory land use map produced by members of Punan Adiu community. For a description of the land use types see Table 3. Source: Participatory Land Use Mapping, 2017.

B.3.2 Consequences of current land use

The Punan Adiu community practice shifting cultivation and each household opens 1 to 2 ha of fallow each year to cultivate crops. Each household has a defined area used for cultivation that is passed on within families. Primary forest is only opened by new families who do not inherit sufficient land to meet their needs, and there is a preference for making use of existing agricultural areas whenever possible. The small number of households in Punan

Long Adiu village means that potential impacts of shifting cultivation and agricultural expansion on deforestation and forest degradation in PACT are limited.

Timber and NTFP harvesting could also contribute to forest degradation and biodiversity loss if extraction is not maintained at or below sustainable off-take levels. The major drivers of deforestation and ecosystem degradation that are expected to cause the majority baseline emissions described in Section G.4 are not related to the activities of the Punan Adiu community, however. They are expected to result from the activation of logging, mining and oil palm concessions if PACT is not effectively protected, as described in Section B.4.

B.4 Drivers of degradation

B.4.1 Causes of land and ecosystem degradation

The main drivers of deforestation and forest degradation in Malinau District are commercial logging and mining operations, and expansion of oil palm plantations. These drivers all threaten forest within the PACT and 79% of the PACT is currently under concessions of various private companies[11]:

- Two commercial oil palm plantations covering a total area of 2,585 ha are present within the PACT - 2,212 ha is assigned to *Serimba Raya Makmur* and 373 ha to *Berkah Sawit Lestari;*
- A mining concession assigned to *Rajawali Agro Perkasa* covers 6,233 ha of the Territory; and
- A Business Permit for Timber Forest Product Utilization – Nature Forest (IUPHHK-HA) held by *PT Rimba Makmur Sentosa* covers 9,670 ha.

The location of these concessions is shown in Figure 5. Note that there is some overlap in the areas covered by these concessions. To date, no oil palm has been planted or mining has started within the PACT. The mining concession is an exploration concession. The timber concession, however, has long been active and the last logging cycle inside the PACT was around 20 years ago. *PT Inhutani II Unit Sei Tubu* is planning to re-open a logging road in the PACT and this would increase the risk of a further cycle of logging in the foreseeable future.

In addition to potential activities of the concession owners within the PACT, the Punan Adiu community also identified threats to wildlife populations from poaching and of the threat of

[11] Bappeda of East Kalimantan 2013. Plantation Spatial Data; Ministry of Environment and Forestry (MoEF) 2013 Landcover Spatial Data

forest degradation from illegal timber harvesting and unsustainable harvesting of NTFPs[12], as well as of illegal deforestation by encroaching farmers external to the community.

[12] Damayanti, E. K. and Berry, N.J. 2016 Problem Tree Analysis, Punan Long Adiu Village. Sustainable Forest and Biodiversity Management in Borneo Project Report.

C. Community and Livelihoods Information

C.1 Participating communities/groups

C.1.1 Demographics

There are 32 households in Punan Long Adiu all of which belong to the Punan Adiu community. The village has a population of 131 people. Age distribution in the community is described in Table 4.

Table 4 Population of Punan Long Adiu Village by age*

Age	Male	Female	Total
0-10	12%	16%	28%
11-20	13%	10%	23%
21-30	13%	10%	23%
31-40	4%	5%	8%
41-50	6%	5%	11%
51-60	1%	4%	5%
>60	3%	1%	4%
Total	**50%**	**50%**	**100%**

*From 23 Households surveyed, out of the total of 32 households
Source: Livelihoods and Socioeconomic Survey, 2016

No explicit socioeconomic groups exist in Punan Long Adiu village and all households have the same main sources of income and subsistence, principally from agriculture and wildlife hunting, although some households also receive a salary for work as government employees or for private companies. The Punan Adiu community consider themselves as a poor to medium class community and do not identify any marginalised groups. All 32 households have similar housing conditions and engage in subsistence farming and wildlife hunting. All households receive health insurance from the District Government, but no health, education, or road infrastructure facilities are provided by the Government.

C.1.2 Organisational capacity

The Punan Long Adiu Village governance structure consists of Village Government and Village Consultative Body (*Badan Permusyawaratan Desa*; BPD). These institutions have different roles in village governance. The Village Government facilitates village development,

and empowerment of village communities, including planning, implementation, and reporting activities and budget. The BPD approves plans submitted by Village Government, receives feedback from the community, conveys the feedback to the Village Government, and monitors and evaluates the Village Government activities and reports.

Village Government consists of a village head, supported by a secretary; a treasurer; three village officials dealing with governance, development, and public affairs; three section heads; a head of sub-villages (*kepala dusun*) and head of settlement/hamlet (*ketua RW & RT*).

In addition to these two institutions, there is a Customary Institution (*Lembaga Adat*) headed by a Customary Chief, and a Community Empowerment Institution (*Lembaga Pemberdayaan Masyarakat*; LPM). These two institutions provide a governance structure that runs in parallel with the Village Government and has an equal say in village governance. The Customary Institution provides guidance and advice to the Village Government and to all community members regarding customary functions. Meanwhile, LPM is a partner of the Village Government in empowering the community, planning and implementing village activities and improving community services. The complete structure of Village Governance is shown in Figure 7.

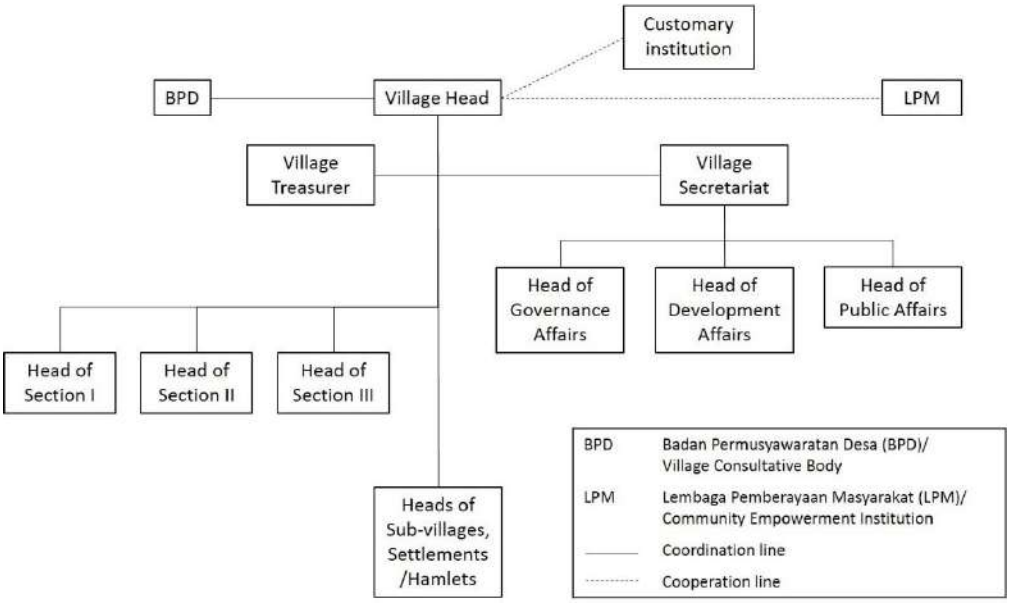

Figure 7 Village Organization Structure (Based on Minister of Home Affairs Regulation No. 84, 2015; modified)

In Punan Long Adiu village, 26 of the 55 adults currently serve as heads or members of the various institutions, including 18 household heads. This demonstrates the high level of representation of all community members in local governance. It is noted however, that the village head, secretary, and head of settlement have the greatest understanding of governmental tasks and other village officials and members of BPD and LPM typically follow

their instructions and support the activities they suggest. This implies capacity of the village governance could be improved. Nevertheless, observations made in the village suggest that there is a strong bond within the community derived from the customary relationship, and this could be seen at village development planning meetings during which all community members are encouraged to participate[13].

Punan Long Adiu customary community will establish a community institution to manage their customary territory, called Dayak Punan Long Adiu Customary Territory Management Body (*Badan Pengelola Wilayah Adat Dayak Punan Long Adiu*; BPWA). The preparation for establishing this institution has been. All community members of the Punan Long Adiu customary community in Malinau district area and its surrounding as well as any individual with a serious commitment and care for the community of Dayak Punan Long Adiu customary community can become members of this institution. Upon the legal recognition by the District Head, the BPWA will be listed in the notarial act and registered into the Malinau District Government (*Kesbangpolinmas*) as a civil society organization.

The regional and district level organisations with responsibility for land management in Punan Long Adiu are[14]:

- Malinau Forest Management Unit (*KPH Malinau*)
- Malinau District Development Planning Agency (*Bappeda Kabupaten Malinau*)
- North Kalimantan Provincial Forestry Service (*Dishut Provinsi Kaltara*)
- North Kalimantan Provincial Development Planning Agency (*Bappeda Provinsi Kaltara*)

C.2 Socio-economic context

C.2.1 Livelihood activities and income

The Punan Adiu community has Punan ethnic identity and was traditionally a hunter-gatherer and nomadic community. Nowadays, they are adapting to sedentary life and farming, though still performing wildlife hunting and gathering NTFPs, mainly for subsistence.

Households in Punan Adiu community receive cash income from selling surplus agricultural produce and NTFPs. Some community members also receive a monthly salary from working as village officials, for private companies, or as teachers. The average annual cash income of

[13] Damayanti, E. K. and Berry, N.J. 2016 Livelihood and Socioeconomic Survey, Punan Long Adiu Village. Sustainable Forest and Biodiversity Management in Borneo Project Report.
[14] Irang, P. 2014. Profil Desa Punan Adiu. Punan Adiu: Desa Punan Adiu, Kecamatan Malinau Selatan Hilir, Kabupaten Malinau

households is around US$ 3,700 per household per year, depending on which activities the household head and other household members are involved in (see Table 5). Non-cash income also comes from agriculture, fishing, hunting and NTFP collection. Average non-cash income of households is US$ 1,600 per household per year[15].

Table 5 Income of Punan Long Adiu Village community by sources of income.

No	Group of source of income of the HH head	No. of HH	Source of income type	Range of annual cash income (IDR)* per HH	Total annual cash income (IDR)* of all HHs	Average annual cash income (IDR)* per HH
1	Agriculture	18	Selling vegetable crops, such as peanut, mung bean, long bean, corn, chilli pepper, and hot chilli pepper	80,000 – 17,550,000	93,080,000	5,171,111
2	Business	1	Grocery shop	120,000,000	120,000,000	120,000,000
3	Fishing	9	Selling various kind of fish	1,200,000 – 12,000,000	40,560,000	4,506,667
4	NTFP	9	Selling handicraft made from rattan (*anjat*, *bekang*, mat), forest fruits (durian, *rambutan*), agarwood, damar resin	350,000 – 27,600,000	73,850,000	8,205,556
5	Hunting	10	Wildboar, deer, mouse deer, etc.	140,000 – 105,200,000	270,090,000	27,009,000
6	Livestock	3	Dog, raised wildboar	150,000 – 5,340,000	5,700,000	1,900,000
7	Monthly salary	16	Village official (6 persons), private company workers (3 persons)	6,000,000 – 36,000,000	282,600,000	17,662,500
8	Others	5	Labor (agriculture, construction), chainsaw man, carpenter (making boat)	2,880,000 – 39,000,000	67,880,000	13,576,000
9	Household members' income	13	Teacher, other business	1,200,000 – 26,400,000	155,100,000	11,930,769
Total annual cash income* (IDR) per household (No.1~8 + 9)				**200,000 – 181,000,000**	**1,118,860,000**	**48,646,087**
Average cash income* (IDR) per household per month						**4,053,841**

Note: HH = household, * Income for 2015-2016, 1USD = IDR 13,000
Source: Livelihood and Socioeconomic Survey, 2016

C.2.2 Cultural and religious context

Community members belong to one of 5 ethnic groups: Java, Kenyah Umalasah, Lundayeh, Punan, and Tahon. The Punan ethnic group in Punan Long Adiu Village includes 6 sub-groups with names derived from the name of the river nearest to the location where the sub-group traditionally lived (see Table 6). Although the Punan community follows a patriarchal system, the ethnicity of the children does not always follow father's ethnicity. Some

[15] Damayanti, E. K. and Berry, N.J. 2016 Livelihood and Socioeconomic Survey, Punan Long Adiu Village. Sustainable Forest and Biodiversity Management in Borneo Project Report.

households identify the children's ethnicity as Punan (Adiu) ethnic, because they are living in Punan Long Adiu Village. The majority of Punan Long Adiu villagers are Catholic (Table 7). There are Moslems also registered as member of this village, but they are currently living in Malinau City.

Table 6 Population of Punan Long Adiu Village by ethnicity*.

Ethnicity	Male	Female
Java	0%	1%
Kenyah Umalasah	1%	0%
Lundayeh	0%	2%
Punan	11%	8%
Punan (Abai)	3%	1%
Punan (Adiu)	29%	32%
Punan (Lore)	1%	1%
Punan (Merap)	3%	3%
Punan (Tubu)	2%	0%
Punan (Setarap)	0%	1%
Tahon	2%	1%

*From 23 Households surveyed, out of the total of 28 households
Source: Livelihoods and Socioeconomic Survey, 2016

Table 7 Population of Punan Long Adiu Village by religion*. Source: Livelihoods and Socioeconomic Survey, 2016

Religion	Male	Female	Total
Catholic	47%	42%	89%
Christian Protestant	4%	7%	11%
Islam	0%	0%	0%

*From 23 Households surveyed, out of the total of 28 households
Source: Livelihoods and Socioeconomic Survey, 2016

C.2.3 Assets and poverty status

Most households in Punan Long Adiu have their own house, and there is only one instance of two households sharing a single house. All houses are made from wood and have tin roofs. Houses vary in size from 5 x 8 m^2 to 8 x 12 m^2 and are situated with approximately 2 to 5 m between houses. Households assist one another when building houses and house size varies according to the capacity of the household head to provide timber (which depends on the availability of timber trees in their farmland), fuel for chainsaw and boat, nails, and food for the neighbours who help building the house. Walls, flooring, and internal supporting structures are usually made from Meranti (*Shorea* spp.) or Kapur (*Dryobalanops sp.*) trees, while the poles for the main foundations of the house are made from Ironwood (*Eusideroxylon zwageri*).

Houses are built approximately 30 cm to 1 m above the ground and the community usually keep firewood, remaining timber from house construction, or livestock under the floor. All houses are equipped with a kitchen, but less than half have a bathroom and toilet (15 houses). Households with no bathroom and toilet use the Malinau River for washing, bathing, and excretion. Rain water is used for drinking and cooking, and water from a nearby dam is usually used for washing and bathing. The dam was built in 2006 using the Village Fund. Dam water is channelled to the houses with pipes and stored in water tanks. Each

house is equipped with two water tanks, 1,200 L and 700 L. The bigger tank was provided by Village Fund, while smaller one was provided by a coal mining company as part of their Corporate Social Responsibility (CSR) Program. During drought, people in Punan Long Adiu will go to Adiu River (approximately 4 km upstream of Malinau River) for collecting drinking and cooking water or buy mineral/processed water from Malinau City. This is because the water in the Malinau river is considered unsafe for consumption due to pollution by the upstream coal mine. Figure 8 shows typical houses in Punan Long Adiu, including storage under the house, and water tanks.

Figure 8 Houses in Punan Long Adiu (Photos by E. Damayanti, 2016)

Five households have chainsaws for cutting trees during farm land preparation, cutting trees for timber used for building houses or cutting firewood from drifted logs in Malinau River. Eleven households have boats to use for transportation from the village to their farmland. Seven households have a motorbike for transportation to areas outside the village. One individual owns a car, and the village has one car for communal use, which is currently broken and awaiting funds for repair. Public transportation is also available 2-3 days a week, for transporting the people to Malinau city in the morning and dropping them back to the village in the evening. Other equipment that forms part of a typical household's assets are fishnet, trawl, and hook for fishing.

Other assets include livestock, trees, and savings. However, the Punan Adiu community does not consider these as assets. Some households raise chickens, ducks, or wildboar mainly for consumption, although they will also sell if others want to buy or there is remaining meat left after their consumption. Income from livestock is relatively low, only IDR 150,000 to 5,340,000 per household per year. This upper income came from selling a raised wildboar (of 70kg) which is a rare occurrence. Some households also raise and train dogs for hunting, and dogs which cannot bark are usually sold.

Trees occur in the patches of farmland, both abandoned or currently being cultivated, that belong to each household. When opening a new field, Punan people would not cut down trees that are important for housing, such as Meranti (*Shorea* spp.), Ironwood (*Eusideroxylon zwageri*), and Kapur (*Dryobalanops* spp.); or honey hive trees, Agarwood (*Aquilaria* spp.), damar resin producing trees, and fruit trees (*durian*, *lai/paken*, *terap*, etc.). Instead, they will maintain these trees as markers of the land and for future use (timber or fruit). Other than naturally grown trees, the Punan Adiu community also plants a few cash crops, such as rubber, cacao, and coffee, with seedlings provided by the District Government. Only 10 households have bank accounts for savings. Saving are mainly for their children's education, as these households send their children for school outside the Malinau District. Only one household has savings for future need.

Communal electricity has been available in the village since 1995, in the form of a diesel generator. The generator was bought using the Village Fund and support from the sub-district government. This machine has been operated for 15 years, with fuel and oil provided by collecting an electricity fee from the community. In 2008, a logging company signed a contract with the Punan Long Adiu community as part of their CSR program to provide a new generator and supply of 200 L diesel fuel and 8 L engine oil per month. With limited fuel, the generator in Punan Long Adiu is operated daily between 5 pm and midnight. Nevertheless, each household has their own electronic devices, for communication (mobile phone), information (radio, television, parabola & digital receiver), relaxation (DVD, sound system), and household appliances (refrigerator, washing machine, rice cooker, and iron). Initially, when the 200 L fuel was used up before the end of a month, the electricity

committee in the village would collect an electricity fee for buying additional fuel. However, this system is not implemented anymore. People typically had no cash to be collected, so others who had money would always pay, but those who didn't have money could not even pay in the next month. So, they have now stopped the electricity payment and the village is left without electricity once the 200 L of fuel has been used. Three households have private diesel generators, while 4 households have solar panels. Only these households have their own electricity when the village electricity supply is not available.

The Punan Long Adiu community considers themselves as poor to medium class community. They defined poverty/wealth classes as detailed in Table 8.

Table 8 Poverty/Wealth class definitions by Punan Long Adiu community

Class	Characteristics	Proportion of households*
Very poor	No motorbike, no car, house building supported by the Government	9%
Poor	No capital to start business, not enough agricultural crops to sell, difficult to access market, no equipment or house appliances as other households have.	48%
Medium	Monthly salary, basic needs fulfilled	39%
Rich	Has motorbike, income from business	4%
Very rich	Has everything needed	0%

* From 23 households surveyed; Source: Livelihoods and Socioeconomic Survey, 2016

C.3 Land tenure and ownership of carbon rights

C.3.1 Land tenure

The Punan Adiu community considers the PACT to be their customary property, inherited from their ancestors. Information regarding this type of customary territory is passed on through generations with mutual understanding from neighbouring customary communities. This type of ownership is not reflected by the existing laws and regulation enacted in Indonesia, however, which require land certification to demonstrate ownership rights. Punan Adiu community has also obtained the legal recognition from Malinau District Government of their identity as Punan Long Adiu Customary Law Community as Unity of the Customary Law Communities in Malinau District (see Annex 10). The mapped PACT boundary that was agreed by surrounding villages and customary communities is part of this legal recognition (see Figure 2).

From a customary perspective, the Punan Adiu community faces no restriction on use of land within the PACT, and access to farmland, timber, NTFPs, and for hunting is controlled by the

Customary Chief. Companies who wish to enter the territory for forest inventory or mining exploration are required to pay, in cash, an amount determined by customary rules (usually a significant amount), and access to certain areas is prohibited by customary rules.

According to State law, however, forest areas should only be accessed by people with a legal right to enter, granted by the Forest Management Unit or through concessions. With the legal recognition of the PACT granted by the Malinau District Government (see Annex 10), the Punan Adiu community have the legal right to make us of the natural resources within their customary territory.

A ruling by Indonesia's Constitutional Court in 2013[16] allows for the re-categorisation of customary forests (*hutan adat*) from 'state forest' (*hutan negara*) to 'forest subject to rights' (*hutan hak*) thus changing the definition of customary forest (*hutan adat*) described in Article 1 point 6 of the 1999 Forestry Law. Categorisation as *hutan hak* involves a recognition of community rights to land and resources (communal ownership). This re-categorisation can be achieved by submission of requests to the Ministry of Environment and Forestry for stipulation of forest areas inside PACT as a customary forest and to the North Kalimantan Provincial Government for stipulation of Other Use Areas (*Areal Penggunaan Lain*; APL) as a customary forest. Once granted the status of the areas will be changed to customary forests in the national forest area map.

The Indonesian Government's five-year plan includes the ambitious target of allocating 12.7 million hectares to social forestry schemes, including customary forests, by 2020. However, very few stipulations for customary forests have been issued to date. Stipulation of the PACT as customary forest therefore provides an opportunity to contribute to this target in Malinau, which is identified by the Government of Indonesia as a Conservation District. It also has the potential to become a milestone nationally, being among the first customary forest areas to be legally stipulated. Securing this stipulation will be an important focus of project activities, as it will add further security to the Punan Adiu community's claim to management rights for their customary territory.

C.3.2 Carbon rights

The Government of Indonesia has developed legislation that discusses carbon rights, and is developing legislation that will describe rights to ecosystem services. Details of who holds the rights to carbon and ecosystem services remain unresolved, however. Carbon rights are not specifically addressed in customary rules, but are assumed to be afforded the same recognition as all other land and resource user rights that are reflected in customary law and

[16] Indonesia Constitutional Court Ruling MK35/2012

recognised by the Punan Adiu community and surrounding villages and customary communities.

It is assumed that legal rights to carbon benefits will be transferred to the Punan Adiu Customary Community upon legal recognition of the PACT, although the project will closely monitor the development of relevant policy, and lobby for the transfer of all rights to communities as necessary.

D. Project Interventions & Activities

D.1 Summary of project intervention(s)

D.1.1 Project intervention

The Punan Adiu community has a commitment to protect forest in their customary territory to meet their current needs and to pass on to future generations. Forest resources within the PACT are threatened by activities of logging, mining and oil palm concessions which currently hold legal rights to land within the customary territory; and by unsanctioned and unsustainable harvesting, hunting and deforestation practices from outsiders that the Punan Adiu community currently lack the legal basis and resources to control.

Of the above-mentioned threats only unsanctioned hunting, harvesting and forest conversion for agriculture by outsiders is currently affecting the forest resources within the PACT. A logging company has announced its intention to subject the forests within its concession overlapping the PACT to a new logging cycle and has submitted the relevant logging plans to the District Forestry Service. The mining concession within PACT is an exploratory concession and an application for an operational mine has not yet been made. However, due to the Punan Adiu community lacking full management rights, both the logging and mining concessions can be activated at any point without any consultation with, or possibility for objection by the Punan Adiu community. The oil palm concession within PACT is still in a consultative process and is situated entirely within the other use area (*Area Penggunaan Lain*). Because the governance rights of this area are not allocated to a ministry, the Village Government has the right to allow or disallow the oil palm plantations. As long as the Village Head and Customary Chief in the village see the value of their customary forest resources for the long-term sustainability of the community and its lifestyle, the plantations may be resisted. But, in absence of legal management rights and a formalized management plan attached to these rights, the persuasive powers of palm oil companies may win planting approval from future chiefs.

The proposed project intervention is therefore **prevention of deforestation and forest degradation**.

D.2 Summary of project activities

D.2.1 Project activities

A summary of the activities that will be carried out to prevent deforestation and forest degradation in PACT is provided in Table 9 (modified from Table D2 in the PDD template).

The activities have been designed so that they work in combination to address the specific threats of deforestation and forest degradation described in Section B.4, and they are therefore all considered to contribute to emission reductions eligible for Plan Vivo certification. Further details of activities are provided in Section G1.3, and a complete management plan is provided in Annex 1.

Table 9 Summary of project activities in PACT

Project activity	Key tasks	Target group
Securing rights and establishing a forest management institution	• Obtain legal stipulation of customary territory as customary forest and inclusion into forest area map • Obtain permits/licenses for forest utilization	BPWA members, community representatives
Forest protection and monitoring	• Customary territory boundary marking and installation of information boards • Training on forest patrol and monitoring • Forest patrol and monitoring activities	BPWA members, forest patrol team, forest boundary marking team
Development of income sources linked to sustainable forest management	• Restoration of waterways and establishment of fish farming • Establishment of ecotourism facilities • Planting agarwood, rattan, and ironwood for future use of NTFP and timber • Training in rattan processing, weaving, and handicraft marketing • Training and support for development and sale of Plan Vivo certificates	BPWA members, ecotourism group, fish farming group, NTFP cultivation group, rattan group

D.3 Effects of activities on biodiversity and the environment

D.3.1 Biodiversity benefits

As described in Sections B.2.1 and B.2.2, PACT is a relatively intact expanse of dipterocarp forest that supports a diverse assemblage of plant and animal species, many of which are endangered or threatened. The project aims to protect this forest and prevent deforestation and forest degradation that would reduce the quantity and quality of forest habitat reducing

the availability of plants and animals for local use, and driving threatened species closer to extinction. The biodiversity benefits of the project are therefore expected to be significant at both a local and international level, and the occurrence of keystone and priority species will be tracked throughout the project as described in Section K.3.

D.3.2 Ecosystem service benefits

Forest within PACT provides a broad range of ecosystem services that support the livelihoods of local communities and that benefit regional and global communities. Among these are the provisioning, regulating and cultural services listed below:

- Provisioning services – forests are the main, and for many households the only, source of livelihoods providing food, fuel, water, medicine, and building materials;
- Regulating services – including climate regulation, local cooling effects, flood prevention, and maintenance of water supplies; and
- Cultural services – including sacred sites, burial grounds and maintenance of cultural heritage associated with forest use.

All of these services depend on the maintenance of relatively intact areas of forest. By preventing deforestation and forest degradation the project will therefore help to safeguard the ecosystem services that local and international populations depend upon.

E. Community Participation

E.1 Participatory project design

E.1.1 Participatory planning process

The project has been developed with the Punan Adiu community, starting from the use of participatory approaches to gather information and understand local drivers of deforestation and forest degradation, progressing through the development and design of activities and management plans to address those drivers, and finally in the development benefit sharing mechanisms, monitoring plans and Plan Vivo agreements that will govern the disbursement of finance generated through the sale of Plan Vivo certificates. Throughout the two-year development process, there has been regular contact between the project coordinator and the Punan Adiu community, as summarised below. Evidence of community involvement in these activities is provided in the activity reports and Annex 2.

Scoping

The scoping phase of the project involved three visits to the proposed project site, by the project coordinator and technical partners. During these visits, the following activities were carried out:

- Identification of project site – Prior to the decision to begin scoping work for a Plan Vivo project, a number of candidate sites were visited to identify areas where the community was interested in exploring approaches to support sustainable management of forest areas under their management. Punan Long Adiu was selected on the basis of strong local commitment to forest protection and the considerable threats to the forest in their customary territory.
- Problem tree analysis[17] – A problem tree analysis was conducted with a representative group of participants from Punan Adiu community to identify the causes and consequences of deforestation and degradation expected in the PACT. The resulting problem trees were discussed and refined in an open village meeting.

[17] Damayanti, E. K. and Berry, N.J. 2016 Problem Tree Analysis for Punan Long Adiu Village. Sustainable Forest and Biodiversity Management in Borneo Project Report

- Village survey[18] – Since recent information on socioeconomic conditions and livelihoods in Punan Long Adiu was not available, a village survey was conducted using household surveys, focus group discussions and key informant interviews. The results of the village survey were presented and discussed in an open village meeting.
- Project activity scoping – Using the information from problem the tree analysis and village survey, a community consultation was carried out to identify specific activities that the community members wished to implement to address specific drivers of deforestation and forest degradation. The outcomes from this activity were used to develop a Plan Vivo Project Idea Note[19].

Project development

During the project development phase, the project coordinator and technical partners made frequent visits to Punan Long Adiu to work with the community on the following activities:

- Participatory land-use mapping[20] – Using remote sensing images as a base map, representative groups of community members produced maps describing current land use within the PACT.
- Project activity planning – Over a period of several months, the project coordinator worked with the Punan Adiu community to develop detailed management plans describing activities that are required to prevent deforestation and degradation. Details of resource requirements were also discussed, and developed into full financial plans for the project. The management plan is provided in Annex 1.
- Monitoring plan development – The project coordinator worked with the Punan Adiu community to develop activity based monitoring plans that can be used to assess whether activities in the management plan are being carried out, and approaches for assessing socio-economic impacts of the project, and tracking biodiversity and drivers of deforestation and forest degradation. The monitoring plan is described in Section K.
- Development of draft Plan Vivo agreement – The management plans, financial plans and monitoring plans developed in the previous activities will be incorporated into a Plan Vivo Agreement describing the requirements for receiving support from the sale of Plan Vivo certificates, and a benefit distribution mechanism that supports the financial plan. An agreement template has been discussed and refined with input from community members (see Annex 3).

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[18] Damayanti, E. K. and Berry, N.J. 2016 Livelihood and Socioeconomic Survey, Punan Long Adiu Village. Sustainable Forest and Biodiversity Management in Borneo Project Report.
[19] Plan Vivo Project Idea Note. Forest Protection in Punan Adiu Customary Community Territory. 2016.
[20] Suryadi, I et. al. 2017. Participatory Land Use Mapping: Punan Long Adiu Village. Sustainable Forest and Biodiversity Management Project Report.

Capacity building

To enable the Punan Adiu community to develop a full understanding of the concepts involved in a Plan Vivo project, and enter into Plan Vivo agreements under conditions required for Free, Prior and Informed Consent (FPIC), the project coordinator conducted the following capacity building activities with community members. The training curricula for these activities are provided in Annex 4.

- An overview of payments for ecosystem services and carbon markets, and how Plan Vivo project activities can enable communities to access these
- An introduction to the Plan Vivo System and how it can be applied to access payments for ecosystem services
- The requirements for validation of the project design and registering as a Plan Vivo project
- Annual reporting requirements required for Plan Vivo certificates to be issued
- Requirements for periodic verification of the project design and benefits achieved

E.1.2 Governance of community groups

To plan and implement project activities, the 6 activity groups of BPWA-PLA will be formed under the Punan Long Adiu Customary Institution and with supervision from an Oversight Body formed from interested parties within and outside the Punan Adiu community. Membership of all groups is open to all men and women from Punan Adiu Community who are over the age of 15 years, on a voluntary basis. Group leaders with responsibility for reporting to the BPWA-PLA and the project coordinator will be elected annually by the group members. The governance structures of these groups are summarised in Figure 9.

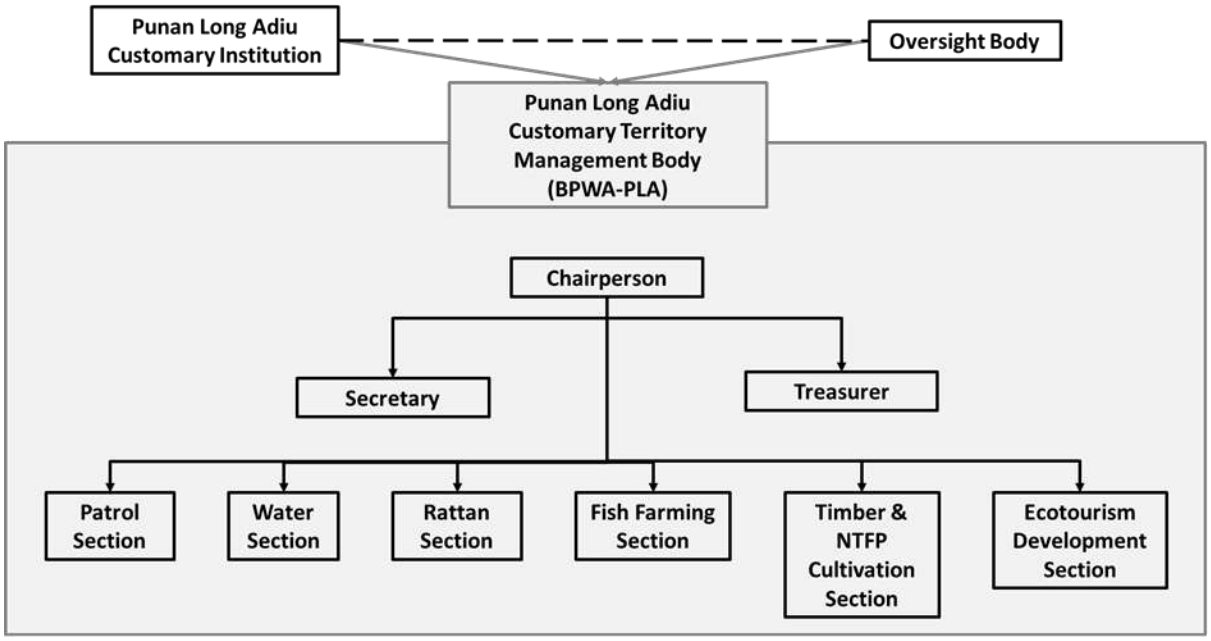

Figure 9 Community group governance structure

E.2 Community-led implementation

E.2.1 Development of management plans

As described in Section E1.1 the development of management plans was led by the Punan Adiu community and facilitated by the project coordinator. Throughout this process, forest management experts from the technical support organisations, LTS International and Daemeter Consulting, were involved to review plans and provide suggestions to improve effectiveness and efficiency. The development of management plans therefore followed an iterative process and the final plans were agreed by all parties involved (see Annex 1).

E.2.2 Storage of management plans

Paper copies of management plans are held by the BPWA Chairperson, and in the office of the project coordinator. Digital copies, and GIS versions of all maps (see Annex 5), are stored on hard drives of project computers in the village, and the project coordinator's office. Online copies are also stored and backed up using a secure cloud-based server.

E.3 Community-level project governance

E.3.1 Community involvement

Decisions regarding day-to-day operations of activity groups will be made using the governance structures described in Section E.1.2. Issues relating to project finance,

monitoring and reporting will be discussed in a quarterly meeting involving village officials, representatives of all activity groups, and the project coordinator. During this meeting monitoring results will be submitted to project coordinator and any issues arising will be discussed. Any decisions required as a result of this meeting will be made using the village governance structures described in Section C.1.2.

E.3.2 Grievance mechanism

Grievances arising within activity groups will be discussed and reported to the project coordinator during quarterly meetings. To record any grievances from the broader community, two grievance books will be maintained by nominated members of the community (one male, one female) with good literacy. Individuals with responsibility for maintaining the grievance books will be made known to the village community, and will agree to record any grievances brought to them by individuals in the grievance book, while maintaining the anonymity of those individuals if requested. Grievances that cannot be settled directly will be referred to the village head, and addressed through existing methods for conflict resolution within the village. All grievances will be detailed in an annual report to Plan Vivo, along with actions taken to settle the grievance.

Conflicts and grievances arising with parties outside the implementing community, for example with neighbouring communities or companies with concessions inside the PACT, that cannot be settled directly with the community, will be lodged with the District Authorities or the Forest Management Unit (FMU). LP3M will maintain contact with these authorities to ensure they are aware of any conflicts or grievances that arise, and will engage with any required conflict resolution processes deemed necessary by the district or FMU authorities.

F. Ecosystem Services & Other Project Benefits

F.1 Climate benefits

F.1.1 Expected climate benefits

The methodology and parameters used to estimate the baseline scenario emissions, project scenario emissions and expected losses from leakage are described in Sections G.4, G.5 and G.6 respectively. The justification for the risk buffer percentage applied is provided in Section H. These estimates are summarised in Table 10 (modified from PDD template Table F1) which describes the net climate benefit expected, and therefore the number of Plan Vivo certificates the project will be eligible to receive if all monitoring targets are met, for each year of the project period.

Table 10 Summary of expected climate benefits from each year of the project period

Intervention type	1	2	3	4	1 – (2 +3+4)
	Baseline scenario emissions (t CO_2e)	Project scenario emissions (t CO_2e)	Expected losses from leakage (t CO_2e)	Risk buffer (t CO_2e/ha)	Net climate benefit (t CO_2e/ha)
Prevention of deforestation and forest degradation	91,712	22,928	3,439	10,128	55,216

F.2 Livelihoods benefits

F.2.1 Expected livelihood benefits

The benefits to the livelihoods of members of Punan Adiu community that are expected to result from project activities are summarised in Table 11.

Table 11 Expected benefits to the livelihoods of members of Punan Adiu community

	Initial situation	Expected benefit
Food and agricultural production	Food obtained from hunting wild pigs and gathering, and from shifting cultivation in defined agricultural areas, within PACT. Some households also maintain fields outside PACT.	Reduced pressure on wild pig populations and NTFPs from unsanctioned and unsustainable hunting and harvesting practices.
Financial assets and incomes	Few households with any source of cash income beyond sale of surplus agricultural production.	All households receive additional income from payments received for forest patrol activities. Households participating in fish farming, rattan group, water group, and timber and NTFP cultivation groups and ecotourism activities also receive additional income.
Environmental services (water, soil, etc.)	Relatively intact forest provides a broad range of ecosystem services that the community depend on for their livelihoods (see Section D.3.2).	Supply of provisioning, regulatory and cultural services provided by relatively intact forest is maintained.
Energy	Fuel wood is collected from within PACT.	Supply of fuel wood is maintained.
Timber & non-timber forest products (incl. forest food)	Timber for building materials, and a broad range of NTFPs are harvested from PACT.	A sustainable supply of building materials and NTFPs is maintained.
Land and tenure security	Ownership of PACT by the Punan Adiu community is recognized by neighbouring communities. But formal recognition as customary forest has not been received by local or national authorities.	Punan Adiu community will have PACT recognized as Customary Forest (*Hutan Adat*).
Use-rights to natural resources	Rights for use of natural resources inside PACT by Punan Adiu community are not formally recognised.	Punan Adiu community will receive full management rights for PACT, and licenses to ecosystem services derived from PACT, for a renewable period of 30 years.
Social and cultural assets	The cultural and social heritage of Punan Adiu community is closely linked to their customary territory.	Social and cultural heritage is secured and passed on to future generations

F.2.2 Potential negative impacts

Some of the project activities involve introducing controls on the utilisation of forest resources to ensure their exploitation is sustainable and does not contribute to deforestation and forest degradation. Project activities could also require financial investment and time away from other livelihood activities. The potential negative impacts this may have, and mitigation measures the project will put in place to address them, are summarised in Table 12.

Table 12 Potential negative impacts on the livelihoods of Punan Adiu community

	Potential negative impact	Mitigation measures
Food and agricultural production	Expansion of agricultural areas within PACT is restricted to areas previously used for shifting cultivation limiting potential to increase agricultural productivity within PACT beyond current levels.	Punan Adiu community members will be encouraged to diversify and intensify production within existing agricultural areas so productivity can be increased without expanding the agricultural zone.
Financial assets and incomes	Village and individual funds could be invested in equipment and infrastructure, or devote time away from other livelihood activities, to carry out project activities required to access finance from the sale of Plan Vivo certificates. These investments could be at risk if expected certificate sales are not realised.	Plan Vivo agreements will only be signed for periods for which required finance has been secured. The first year of project activities will be supported with donor finance unlinked to the sale of Plan Vivo certificates and in subsequent years activities will be supported from the sale of ex-post certificates issued for emission reductions achieved in previous years.
Environmental services (water, soil, etc.)	None – environmental services are expected to benefit from project activities.	NA
Energy	None – supply of fuelwood is not expected to be reduced.	NA
Timber & non-timber forest products (incl. forest food)	None – demand for building materials and NTFPs from the Punan Adiu community is unlikely to exceed levels of sustainable extraction allowed in village regulations.	NA
Land & tenure security	None	NA
Use-rights to natural resources	None	NA
Social and cultural assets	None	NA

F.3 Ecosystem & biodiversity benefits

F.3.1 Expected benefits to biodiversity and ecosystem services

The expected benefits to the biodiversity and ecosystem services (in addition to the climate benefits described in Section F.1) in PACT are summarised in Table 13.

Table 13 Expected benefits to biodiversity and ecosystem services

	Initial situation	Expected benefit
Biodiversity	PACT supports a diverse assemblage of plant and animal species (see Section B.2.2).	Biodiversity value is maintained to the benefit of local and global communities.
Water/Watersheds	Forest in PACT provides a clean source of water for Punan Adiu community.	Quality of water supply is maintained.
Soil productivity/conservation	Forest in PACT prevents soil erosion and helps maintain productivity in agricultural areas.	Soil erosion is prevented and agricultural productivity is maintained or improved.
Other ecosystem services	Forest in PACT provides a broad range of ecosystem services (see Section D.3.2).	Supply of ecosystem services is maintained.

F.3.2 Potential negative impacts on biodiversity and ecosystem services

Many positive impacts on biodiversity and ecosystem services are expected as a result of the project, as described in Table 13. Since the project aims to prevent deforestation and degradation of the forest ecosystem that supports this biodiversity and provides the ecosystem services, and project activities have been developed that will also enhance rather than diminish these values, there is only minimal potential for negative impacts on biodiversity and ecosystem services.

If project activities displace deforestation or forest degradation to areas outside the project area, this could have a negative impact on biodiversity and ecosystem services in those areas. The risk of this type of displacement, and the activities in place to mitigate this risk, are discussed in Section G.6.1.

Activities to increase income from sale of NTFPs could threaten the exploited species, and other species that depend on them if extraction is not maintained at sustainable levels. NTFP groups will therefore be encouraged to develop management plans to ensure that levels of do not exceed the rate of production, including planting where necessary.

G. Technical Specification

G.1 Project intervention and activities

G.1.1 Project intervention

This technical specification describes the expected climate benefits from **prevention of deforestation and forest degradation** in PACT. The project area is described in Section B.

G.1.2 Applicability conditions

This technical specification is only applicable to the specified project area – PACT. Expansion of the project beyond this area will require development of additional technical specifications and project design documents.

G.1.3 Project activities

The project activities that will be carried out to achieve the expected climate benefits are summarised below. Full management plans including details of all activities are provided in Annex 1.

Securing rights and establishing a forest management institution

To prevent activities of timber, oil palm and mining companies within PACT and to provide the legal basis for sustainable management of the forest, Punan Adiu community have entered into a process for formal recognition of their customary territory as customary forest and the rights to utilise its resources. The community will be facilitated by the project coordinator to continue with this process by persuing issuance of the following regulations, permits and licences.

Recognition of the customary community and their customary territory

To secure formal recognition of the PACT as customary forest, Punan Long Adiu Village Head Decrees will be issued on: i) The PACT management plan and protection of the PACT through implementation of Punan Long Adiu Village Regulations[21]; and ii) Establishment of the PACT Management Body (BPWA) through notarial act.

A Bupati decree on recognition and protection of Punan Adiu Customary Community has been signed, and this will be passed to the Provincial Governor and then to the Ministry of

[21] Punan Long Adiu Village Regulation No. 07/2015 on Governance Plan of Punan Adiu Customary Community and their Customary Territory, articles 9 & 10 paragraphs 1 to 4.

Internal Affairs. A request to the MoEF will then be submitted for legal stipulation of forest areas within PACT as a customary forest. A request to the North Kalimantan Provincial Government will also be submitted for legal stipulation of Other Use areas (*Areal Penggunaan Lain*; APL) within PACT as customary forest. Finally, the customary forest will be designated as 'forest subject to rights (*Hutan Hak)* in the national forest area map.

Since the regulations for recognition of customary forests (*Hutan Adat*) are in their infancy, it is unclear how long it will take before all of the required approvals have been achieved. It is expected that this will be achieved within the first project period, and the project coordinator will closely monitor the process and assist with the production of all required documentation. It is noted however that some communities have received recognition of their customary forests in a much shorter time period than this.

Permits/licenses for forest utilization

Once the customary territory is formally recognised as customary forest, The Punan Adiu community will request i) permit to utilize the ecosystem services (IUPJL); and ii) permits/licenses for implement forest carbon management in PACT based on current MoEF regulations.

Forest protection and monitoring

To prevent unintended encroachment into PACT, and discourage the unsanctioned or unsustainable exploitation of forest resources, village regulations to ensure sustainable resource use will be developed, boundaries will be clearly marked and forest patrol and monitoring teams will be mobilised to detect and discourage encroachment and unsanctioned use, and to monitor forest condition and biodiversity. The main tasks required to achieve this are described below.

Customary territory boundary marking and installation of information boards

The complete boundary of the customary territory will be clearly marked, and information boards with details of village regulations, and maps showing the PACT extent will be posted at prominent locations. To provide forest patrol pathways, facilitate biodiversity monitoring and to prevent spread of understory fires from burning carried out when clearing fields adjacent to the PACT; a firebreak around the PACT boundaries that are not defined by waterways will be opened and cleared twice a year, in collaboration with bordering customary communities.

Training on forest patrol and monitoring

Forest patrol teams formed from representatives of all households in Punan Long Adiu village will be established and trained in the skills needed to complete effective patrols and monitoring activities, including: i) Basic knowledge on forest protection and monitoring ii) Identification of endangered and protected flora and fauna; iii) Use of Spatial Monitoring and

Reporting Tool (SMART) for recording forest patrol and monitoring data; iv) Use of GPS; and v) Data collection and reporting.

In addition to training on the forest patrol and monitoring, the forest patrol teams who will mostly be from younger generations that have grown up in Punan Long Adiu village will be re-introduced to traditional knowledge on trees and medicinal plants, through training on tree and medicinal plants identification. These trainings will not only revitalize and conserve the customary wisdom of Punan ethnicity, but will also be valuable for implementing forest and biodiversity monitoring.

Forest patrol and monitoring activities

Two types of forest patrol and monitoring will be conducted - routine patrol and boundary patrol. Routine patrols will be conducted once every two months by two shifts of 16 persons divided into four patrol groups, patrolling four patrol blocks for 14 days. Routine patrol will be combined with boundary marking activities and monitoring of deforestation and forest degradation drivers as well as biodiversity. Boundary patrols will be conducted twice a year, in March and October, deploying all patrol team members (32 persons) divided into 8 patrol groups following different PACT boundary locations over a period of 14 days. In one of the two patrols each year, army and police personnel will be requested to join the patrol. After completion of each patrol cycle, patrol teams will submit their reports to staff of the project coordinator organization.

Purchase of equipment for supporting the forest patrol and monitoring activities will be facilitated by the project coordinator including: construction of patrol posts in each of the four patrol blocks, purchase of forest patrol and monitoring equipment, and individual patrol equipment and supplies.

Development of income sources from sustainable forest management

To reduce the likelihood that controls on forest resource use will displace activities to areas outside PACT, and to lay the foundation for long term financing of forest protection activities from additional income raised from sustainable forest management activities, project activities will be carried out to increase income from existing forest resource use activities, and to establish new sources of income. Realising the potential of Sigong Kelafang lake and the surrounding forest, the community will develop an integrated protection and livelihood program in this PACT block, through: i) utilizing Sigong Kelafang lake and surrounding areas for fish farming; and ii) preparation of facilities for nature school/ecotourism - making use of patrol posts combined with homestays, installing solar cell power, water treatment and waste management systems, and rehabilitation and reactivating an old logging road for access to the lake. Agarwood (*Aquilaria* spp.), rattan, and Ironwood (*Eusideroxylon zwageri*) will also be planted within PACT for future use of NTFPs and timber; and iii) providing training in rattan processing, weaving and marketing.

G.2 Additionality and environmental Integrity

G.2.1 Regulatory surplus

As described in Section B.3.1, the PACT includes land with three different legal designations:

- Limited production forest (*Hutan Produksi Terbatas*), 42%;
- Other use area (*Area Penggunaan Lain*), 38%; and
- Protection forest (*Hutan Lindung*), 20%.

Of these legal designations, the only one that confers a regulatory requirement for forest protection is *Hutan Lindung*. It is demonstrated however, by the analysis presented in Section G.4.3, that this legal designation alone is not sufficient to prevent deforestation and forest degradation.

To take account of any potential impact of legal designation, baseline rates of deforestation and forest degradation in Malinau district are stratified according to the legal classification as well as vegetation type and topography (see Section G.4.3). Using these stratified rates to estimate the climate benefits of the project, should therefore help ensure that the estimated climate benefits are additional to those that would be achieved from forest governed under comparable regulatory conditions.

G.2.2 Barrier analysis

Despite a strong commitment to protecting forest in their customary territory, the Punan Adiu community face significant legal, financial, and technical barriers to developing and implementing effective forest management plans. A summary of these barriers, and how project activities will enable the community to overcome them, is provided in Table 14.

Table 14 Barrier analysis

Type of barrier	Description	Project activities to overcome the barrier
Legal	Punan Adiu community lack the legal rights to their customary territory, most of which is currently assigned to logging, mining and oil palm concessions. Without these rights, the Punan Adiu community lack the legal basis to develop and enforce controls on forest use in the PACT. While the Punan Adiu Community was pursuing legal recognition of their customary forest prior to the project, their progress was limited.	The project will assist the community to secure legal recognition of the PACT as customary forest and to obtain the necessary permits for carbon and ecosystem services, by facilitating the mapping, consultations and documentation required. The project will also assist the community to develop and enforce regulations on forest use in the PACT.
Financial	Punan Adiu is a poor community with few sources of cash income, and pressing requirements for village development including securing a clean water supply and development of healthcare and education facilities and support. The community therefore lacks the finance required to develop and implement the activities needed to effectively protect their customary territory.	The project will provide initial donor finance for the development of a Plan Vivo project, and to help the community to identify sustainable sources of finance that will enable them to carry out the activities needed to protect the PACT. The project will also support the activities that enable the community to develop or increase cash income from sustainable use of NTFPs, fish farming, and sale of rattan products.
Technical	The Punan Adiu community have little experience of forest patrolling and monitoring, and currently employ only basic processing and marketing techniques to produce and sell rattan products.	The project will provide training for forest guards, and will provide funding for rattan processing machinery and capacity building to support the development of rattan product production and marketing.

G.2.3 Environmental integrity

Since the project aims to prevent emissions from deforestation and forest degradation, there is no potential that the community could have made alterations to the project area prior to the start of the project for the purpose of increasing climate benefits of the project.

G.2.4 Avoidance of double counting

Three potential sources of double counting have been considered in the design of the project: i) within the project – if finance raised for biodiversity conservation or other types of ecosystem service payments were used to fund protection of the same area for which Plan

Vivo certificates had been sold; ii) with other carbon projects – if the community, or other parties, entered into agreements for the sale of emission reduction credits as part of a project or jurisdictional programme that covered the Plan Vivo project area; and iii) if Plan Vivo certificates are used to offset emissions from parties outside Indonesia, and the Government of Indonesia use those same emissions reductions to meet their Nationally Determined Contributions to the Paris Agreement under the United Nations Framework Convention on Climate Change (UNFCCC). Measures the project will take to avoid double counting from these sources are summarised below.

Within the project

In addition to the sale of Plan Vivo certificates to parties that require certified-emission reductions, the project will also be marketed to funders whose primary interest is biodiversity conservation or forest protection (see Section I.6). If not properly managed, this could undermine the additionality of certified emission reductions, if finance to protect the same area of forest is raised from different sources. To avoid this, each Plan Vivo certificate issued will also be assigned a value for 'hectares of habitat protected' and 'hectares of deforestation/degradation prevented'. Any funding raised for habitat protection or to offset deforestation or degradation will, therefore, have a corresponding number of Plan Vivo certificates assigned to the funder on the Markit registry[22], to avoid the potential for 'double-selling' of the project.

Other carbon projects

When the community groups enter into Plan Vivo agreements they are required to relinquish all rights to emission reductions resulting from prevention of deforestation and forest degradation within the project area to the project coordinator, effectively preventing them from developing other carbon projects that deliver the same benefits with other parties or standards. Once all rights are secured the community will also have the power to prevent government or private sector interest developing carbon projects within their customary territory.

While the community is in the process of securing all relevant rights, permits, and licences, the project coordinator will maintain a dialogue with the North Kalimantan Provincial Forestry Service (through the Forest Management Unit in Malinau), the Malinau District Planning Agency, and the Malinau District Environmental Service to ensure they are made aware of, and can lobby against any initiatives that could conflict with the project. If such conflicts do arise, issuance of Plan Vivo certificates will be suspended until a resolution that ensures there is no potential for double-counting of emission reductions has been found.

[22] http://www.markit.com/product/registry

Nationally Determined Contribution (NDC)

The Government of Indonesia's Nationally Determined Contribution (NDC) includes emissions from forestry and agriculture. To prevent double counting, emission reduction certificates sold to out of state parties for use as carbon offsets should therefore be excluded from the NDC. Mechanisms for addressing this are under development in Indonesia and other countries with NDCs that include forests in their scope. A potential outcome is that the Government of Indonesia could decide to prevent or limit the sale of carbon offsets from forestry projects to out of state parties. If this occurred, Plan Vivo certificates could only be marketed to those willing to make a voluntary commitment to helping Indonesia meet its NDC, but that would not make use of the certificates to offset their own emissions, which would need to be reflected in the way that certificates are recorded in Markit registry.

A range of other outcomes is also possible and the project coordinator will monitor the development of relevant national and international legislation and maintain a dialogue with the Plan Vivo Foundation to ensure that any changes required to the way that certificates are registered are implemented to ensure that the project remains in compliance with all relevant legislation put in place to prevent this type of double counting.

G.3 Project period

The project period and quantification period are defined according to the requirements of the Plan Vivo Standard, and the Approved Approach for Estimation of climate benefits from REDD in community managed forest (AA-CFREDD; Annex 6), as summarised below.

G.3.1 Start date

The Director of the project coordinator organisation has been working with the Punan Adiu community since 1979, and established LP3M in 2005. LP3M facilitated participatory mapping of the PACT, and began working on development of a Plan Vivo project through the SFBMB project in 2016.

For the purpose of estimating the climate benefits from project activities, the project start date is considered to be date when forest patrol and monitoring teams will have completed their training and started their patrol cycle. The start date is expected to be 1 Jan 2018. The project will operate in 5-year project period, during which Plan Vivo agreements will be entered into and monitoring and reporting will be carried out.

The first project period will therefore run from 1 Jan 2018 to 31 Dec 2022.

G.3.2 Quantification period

Annual climate benefits, for each year of the 5-year project periods, will be estimated at the start the project period and verified at the end of the project period.

Alignment of the quantification period with the project period helps to ensure that the quantification period does not exceed the period over which participants can make a meaningful commitment to the project intervention, since it is the same period over which Plan Vivo agreements will be entered into if sufficient funds are available.

Estimates of baseline and project scenario emissions will be revised at the end of each project period, so a five-year quantification period that is renewable provides the potential to generate a more accurate estimate of the long-term impacts of forest protection than would be possible with a longer quantification period.

Since forest protection activities are not expected to be affected by cyclical management activity e.g. harvesting or naturally occurring cycles, it was not necessary to define a quantification period that accounted for cyclical fluctuations.

G.4 Baseline scenario

The baseline scenario is defined according to the requirements of the Plan Vivo Standard, and the Approved Approach for Estimation of climate benefits from REDD in community managed forest (AA-CFREDD; Annex 6), as summarised below.

G.4.1 Defining the baseline scenario

The baseline scenario is a continuation of land use activities occurring within the project area immediately prior to the project start date. The consequences of these activities are described in Section B.3.2. As well as exposure to degradation and deforestation as a result of current unsustainable land use practices, this scenario also involves exposure to the drivers of degradation described in Section B.4.1.

When defining the baseline scenario, the following potential scenarios were considered:

i) Effective protection of the project area by the community
ii) A continuation of current land use activities within the project area

During discussions with stakeholders in the project village, and district government offices, no other potential future land use scenarios were identified.

Scenario i) was excluded on the basis of a barrier analysis conducted by following the Approved Approach for demonstrating Additionality[23]. The results of the barrier analysis are summarised in Section G2.2.

G.4.2 Carbon pools and emission sources

The carbon pools that are expected to make the most significant contribution to the climate benefits of project activities are above- and below-ground woody biomass, since these are expected to be reduced under the baseline scenario, and project activities are expected to prevent emissions associated with the decline.

Carbon stocks in non-tree biomass, litter, dead wood, and soil are also expected to decline under the baseline scenario, and the decline is expected to be reduced under the project scenario. These carbon pools are either considered unlikely to generate significant emission reductions (non-tree biomass, litter, dead wood), or too costly to quantify (soil) so are conservatively excluded.

GHG emissions from biomass burning (other than CO_2 emissions from loss of above- and below-ground biomass) are also conservatively excluded on the basis that they are expected to be higher in the baseline scenario than project scenario.

Emissions from fossil fuel combustion and fertiliser application are not expected to be significantly impacted by project activities, and are not accounted for.

G.4.3 Baseline emissions methodology

The methodology for estimating baseline emissions is described in AA-CFREDD Section 3.1.1 (see Annex 6). The data and parameters used are summarised below.

Forest strata

The forest strata present within the project area are classified according to forest type, legal classification and topographic class as summarised in Table 15.

[23] http://planvivo.org/docs/Approved-Approach-Additionality.pdf

Table 15 Classes used for classification of forest strata

Type	Values	Source	Justification
Forest type (i)	• Dipterocarp forest • Secondary dipterocarp forest	LCCA* see Figure 10	Forest type classifications in national land cover maps reflect the main differences between the types of forest present within the project area.
Legal classification (j)	• Protection Forest (*Hutan Lindung*) • Limited Production Forest (*Hutan Produksi Terbatas*) • Other Use Area (*Areal Penggunaan Lain*)	MoEF (2014) Forestry Spatial Plan. See Figure 10.	Ministry of Environment and Forestry land use designations identify the types of activity that can be legally carried out, and are likely to be a major influence on the drivers of deforestation and forest degradation
Topographic class (k)	• Lowland (<300 m.a.s.l.) • Hill and sub-montane (300 – 900 m.a.s.l) • Montane (>900 m.a.s.l)	LCCA* see Figure 10	Topographic classes are determined according to elevation, which is likely to affect drivers of deforestation and forest degradation.

* LCCA = Land Cover Change Assessment, 2016 (Annex 7)

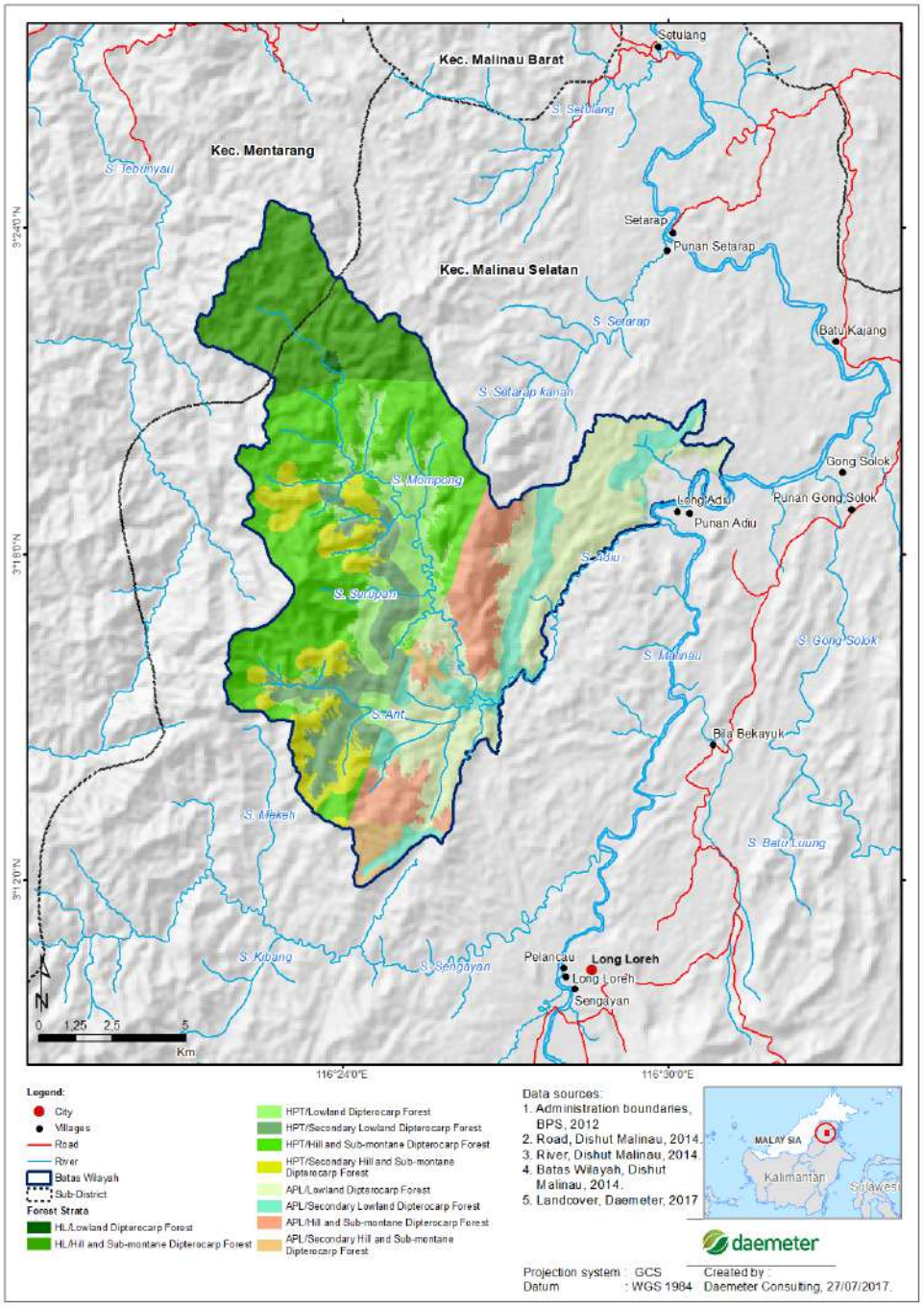

Figure 10 Forest strata in the project area in 2016. Source: Land Cover Change Assessment, 2016 (see Annex 7)

Reference region

The reference region is defined by the boundary of Malinau District. The project area itself is excluded from the reference region however. The reference region includes forest strata that have the same characteristics, and are therefore expected to be exposed to similar drivers of deforestation and forest degradation, as forest within the project area (see Figure 11).

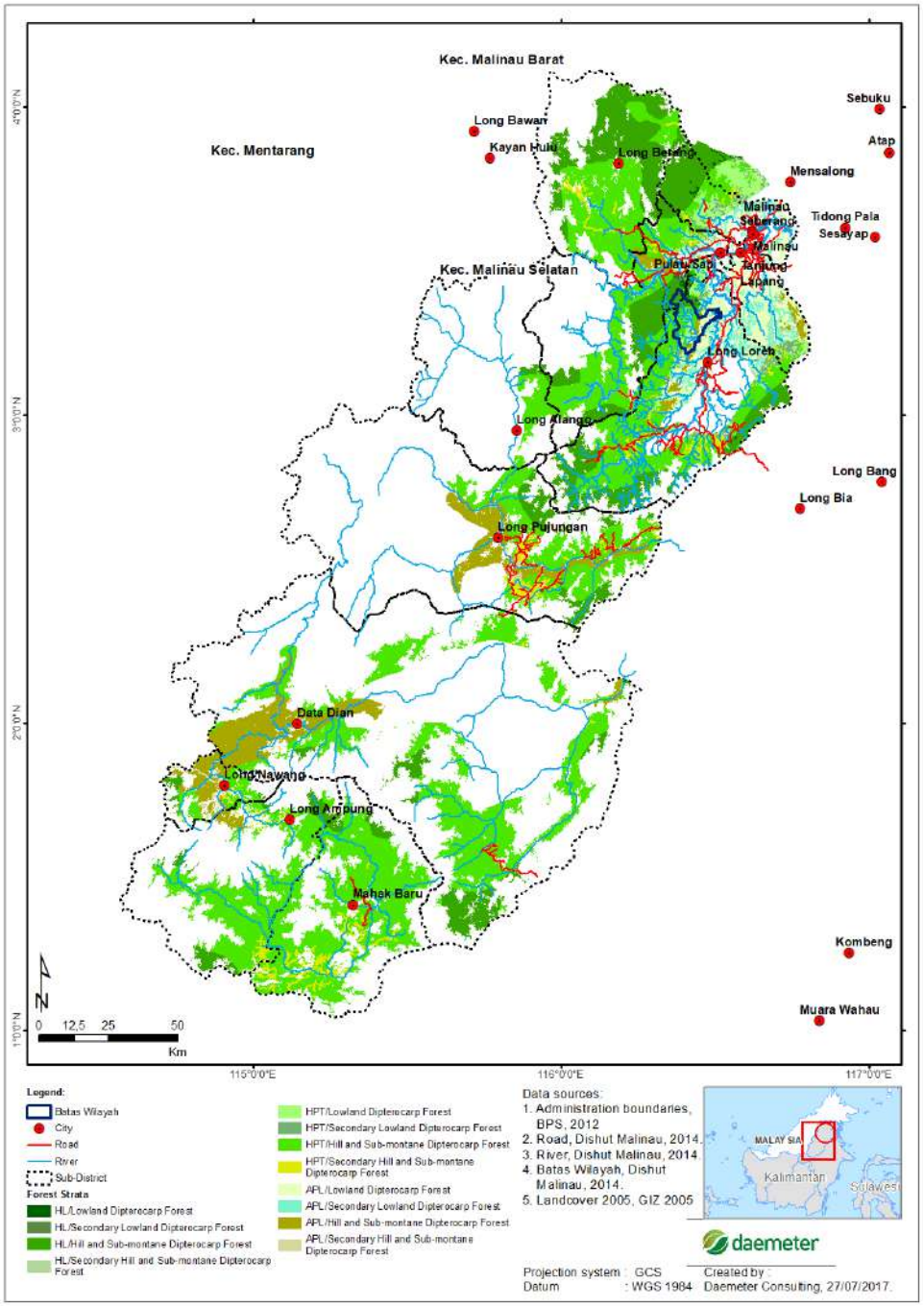

Figure 11 Forest strata in the reference region in 2005. Source: Land Cover Change Assessment, 2016 (Annex 7)

Project periods

Parameters related to project periods are summarised in Table 16.

Table 16 Project period parameters

Parameter	Value	Source	Justification
Length of the reference period (T_{RP})	11 years	The reference period (RP) is from 2005 to 2016	The reference period was selected based on the availability of suitable remote sensing data, and so that the end year was within 2 years of the project start date. An 11-year period was also considered to be a period over which patterns of deforestation and degradation that have occurred would be likely to continue during the project period
Length of the project period (T_{PP})	5 years	The first project period will run from Jan 2018 to Dec 2022 (see Section G.3.1)	see Section G.3.1

Land cover change

Land cover change parameters and values are summarised in Table 17 and Table 18.

Table 17 Land cover change parameters

Parameter	Values	Source	Justification
Area of forest type *i*, legal classification *j* and topography class *k* present in the project area at the start of the project period ($A_{PA_{i,j,k}}$)	See Table 18	LCCA* (Figure 10)	The land cover change assessment provides an estimate of forest strata present within the project area for 2016 which is within 2 years of the start of the project period
Area of forest type *i*, legal classification *j* and topography class *k* present within the reference region at the start of the reference period ($A_{RR_{i,j,k}}$)	See Table 18	LCCA* (Figure 11)	The land cover change assessment provides an estimate of forest strata present within the reference region in 2005, which is the start of the reference period
Area of forest type *i*, legal classification *j* and topography class *k* in the reference region converted to non-forest during the reference period ($A_{Def_{i,j,k}}$)	See Table 18	LCCA* (See Figure 11)	The land cover change assessment provides an estimate of forest strata present at the start and end of the reference period (2005 and 2016), from which areas deforested can be calculated.
Area of forest type *i*, legal classification *j* and topography class *k* in the reference region converted to degraded forest during the reference period ($A_{Deg_{i,j,k}}$)	See Table 18	LCCA* (See Figure 11)	The land cover change assessment provides an estimate of forest strata present at the start and end of the reference period (2005 and 2016), from which areas deforested can be calculated.

* LCCA = Land Cover Change Assessment, 2016 (Annex 7)

Table 18 Area of forest strata present at in the project area at the start of the project period (A_{PA}), and in the reference area at the start of the reference period (A_{RR}); and amount of deforestation (A_{Def}) and degradation (A_{Deg}) of forest strata occurring in the reference region during the reference period.

Legal designation	Forest type and topographic class	Project area (ha)	Reference region (ha)		
		2016	2005	2005 - 2016	
j	i, k	A_{PA}	A_{RR}	A_{Def}	A_{Deg}
Protection forest (*Hutan Lindung*)	Lowland Dipterocarp Forest	33	5,083	84	124
	Secondary Lowland Dipterocarp Forest	0	1,364	129	0
	Hill and Sub-montane Dipterocarp Forest	2,655	305,401	960	727
	Secondary Hill and Sub-montane Dipterocarp Forest	0	2,655	234	0
Limited production forest (*Hutan Produksi Terbatas*)	Lowland Dipterocarp Forest	1,549	46,066	696	5,988
	Secondary Lowland Dipterocarp Forest	1,298	19,522	529	0
	Hill and Sub-montane Dipterocarp Forest	4,044	880,373	6,742	70,888
	Secondary Hill and Sub-montane Dipterocarp Forest	1,286	63,040	2,575	0
Other use area (*Area Penggunaan Lain*)	Lowland Dipterocarp Forest	3,105	71,398	6,452	10,760
	Secondary Lowland Dipterocarp Forest	1,245	45,478	7,200	0
	Hill and Sub-montane Dipterocarp Forest	1,341	149,189	3,369	7,782
	Secondary Hill and Sub-montane Dipterocarp Forest	335	9,808	1,257	0
Total		**16,892**	**1,599,375**	**30,226**	**96,269**

Source: Land Cover Change Assessment, 2016 (Annex 7)

Carbon stocks

Above-ground biomass carbon stock parameters were derived from a report commissioned by the Indonesian-German Forest and Climate Protection Programme (FORCLIME)[24]; which used a database of more than 200 literature-based sources corresponding to Kalimantan, and the Indonesian archipelago (Navratil 2013). To estimate below-ground biomass the

[24] Navratil, P. 2013. Land Cover Situation and Land-Use Change in the Districts of West Kalimantan and East Kalimantan, Indonesia: Assessment of District and Forest Management Unit Wide Historical Emission Levels. Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, FORCLIME Forests and Climate Change Programme: Jakarta.

root:shoot ratio recommended for tropical rain forests in the IPCC Guidelines for National Greenhouse Gas Inventories[25] was applied for all land cover types (IPCC, 2006))

Carbon stock parameters are summarised in Table 19 and Table 20.

Table 19 Carbon stock parameters

Parameter	Value	Source	Justification
Carbon density of forest type i (C_i)	See Table 20	Navratil (2013); IPCC (2006)	Carbon stocks in above ground biomass estimated using a regional study incorporating an extensive literature review and field measurements. Below ground biomass estimated using a root:shoot ratio of 0.37.
Carbon density of degraded forest of forest type i (C_{SF_i})	See Table 20	Navratil (2013); IPCC (2006)	
Carbon density of non-forest (C_{NF})	See Table 20	Navratil (2013); IPCC (2006)	

Table 20 Carbon density of forest types present in the project area

Forest type and topographic class	Carbon density* (Mg C ha^{-1})		
	AGB	BGB	Total
Lowland Dipterocarp Forest (C)	235	87	322
Secondary Lowland Dipterocarp Forest (C_{SF})	138	51	189
Hill and Sub-montane Dipterocarp Forest (C)	167	62	229
Secondary Hill and Sub-montane Dipterocarp Forest (C_{SF})	97	36	133
Deforested land (C_{NF})	24	9	33

* AGB = Above Ground Biomass; BGB = Below Ground Biomass; Source: Navratil (2013); IPCC (2006)

G.4.4 Baseline emissions estimate

Expected baseline emissions are estimated using the equations in AA-CFREDD Section 3.1.1 (see Annex 6) and the parameters described in Section G.4.3 of this PDD. The calculated parameters and values are summarised in Table 21 and Table 22, and the calculations are provided in Annex 8. **Expected baseline emissions for the first project period are 91,712 Mg CO_2 per year.**

[25] Intergovernmental Panel on Climate Change (IPCC) 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Prepared by the National Greenhouse Gas Inventories Programme. Eggleston, H.S., Buendia, L., Miwa, K., Ngara, T. and Tanabe, K. (eds.). IGES, Japan.

Table 21 Expected baseline emission estimate parameters

Parameter	Values	Source
Average proportion of forest type *i*, legal classification *j* and topography class *k* within the reference region that was deforested in each year of the reference period ($D_{RR_{i,j,k}}$)	See Table 22	AA-CFREDD Equation 1 (see Annex 8)
Average proportion of forest type *i*, legal classification *j* and topography class *k* within the reference region that was degraded in each year of the reference period ($G_{RR_{i,j,k}}$)	See Table 22	AA-CFREDD Equation 2 (see Annex 8)
Baseline scenario emissions from deforestation and forest degradation expected during the project period (E_{BL})	458,560 Mg CO_2	AA-CFREDD Equation 3 (see Annex 8)

Table 22 Average proportion of forest strata in the reference region deforested (D_{RR}) and degraded (G_{RR}) during the reference period

Legal designation	Forest type and topographic class	Annual % deforested	Annual % degraded
j	i, k	D_{RR}	G_{RR}
Protection forest (*Hutan Lindung*)	Lowland Dipterocarp Forest	0.2%	0.2%
	Secondary Lowland Dipterocarp Forest	0.9%	0.0%
	Hill and Sub-montane Dipterocarp Forest	0.0%	0.0%
	Secondary Hill and Sub-montane Dipterocarp Forest	0.9%	0.0%
Limited production forest (*Hutan Produksi Terbatas*)	Lowland Dipterocarp Forest	0.2%	1.3%
	Secondary Lowland Dipterocarp Forest	0.3%	0.0%
	Hill and Sub-montane Dipterocarp Forest	0.1%	0.8%
	Secondary Hill and Sub-montane Dipterocarp Forest	0.4%	0.0%
Other use area (*Area Penggunaan Lain*)	Lowland Dipterocarp Forest	0.9%	1.5%
	Secondary Lowland Dipterocarp Forest	1.6%	0.0%
	Hill and Sub-montane Dipterocarp Forest	0.2%	0.5%
	Secondary Hill and Sub-montane Dipterocarp Forest	1.3%	0.0%
Total		0.2%	0.2%

Source: Land Cover Change Assessment, 2016 (Annex 7)

G.5 Climate benefits

The climate benefits are estimated according to the requirements of the Plan Vivo Standard, and the Approved Approach for estimation of climate benefits from REDD in community managed forest (AA-CFREDD; Annex 6), as summarised below.

G.5.1 Climate benefit methodology

The methodology for estimating climate benefit (B) is described in AA-CFREDD Section 3.1.4 (Annex 6); with the equation:

$$B = E_{BL} - E_{PS} - E_{LK}$$

The methodology and parameters for estimating baseline emissions (E_{BL}) are described in Section G.4.3, and for leakage emissions (E_{LK}) in Section G.6.1. The methodology for estimating expected project scenario emissions (E_{PS}) is described in AA-CFREDD Section 3.2.1 (see Annex 6). Following this approach, project scenario emissions are estimated by multiplying the baseline scenario emissions by an expected effectiveness factor (F), which for the first project period is a conservative estimate of the percentage of baseline emissions and removals that are expected to be avoided as a result of project activities.

It is expected that the combination of project activities will be sufficient to prevent all deforestation and forest degradation that would have resulted from the activation of timber, mining and oil palm concessions within the project area. Three causes of deforestation and degradation will either not be fully addressed by project activities, or are likely to be beyond the influence of Punan Adiu community: i) Expansion of agricultural areas by new families in Punan Long Adiu Village; ii) Opening of fallows in shifting cultivation areas; and iii) Reopening of an old logging road. The impacts of these causes on the expected effectiveness of the project in preventing the deforestation and forest degradation are discussed below.

Agricultural expansion

There are currently four new households within Punan Adiu community that are yet to establish their own fields, and are currently making use of their parent's land. It is the customary right of these families to establish their own fields by opening new areas of forest. It is possible that they will choose not to do this, but if all four families decided to open new fields during the project period it could result in deforestation of up to 8 ha of Lowland Dipterocarp Forest, reducing the climate benefit of the project by up to 0.5%.

Opening fallows

The Punan Adiu Community intend to continue using their existing fields within the PACT for shifting cultivation. Since shifting cultivation is already practiced in these areas, this is not a true source of deforestation, but part of cyclical pattern of clearance and regrowth. Since the verification approach will compare forest area present before and after the project period, however, any fallows opened during the project period could be detected as deforestation. Each of the 32 households in Punan Long Adiu open 1 to 2 ha of fallow each year so the maximum amount of 'deforestation' that may be detected because of their shifting cultivation activities would be around 50 ha of deforestation in Secondary Lowland Dipterocarp forest, reducing the apparent climate benefit of the project by up to 1.5%.

Road building

A potential impact that may be beyond the control of the Punan Adiu community is the re-opening of an old logging road that would pass through around 15 km of secondary lowland dipterocarp forest (6km), lowland dipterocarp forest (9km), and hill and sub-montane forest (1km) within the PACT, which is already approved by the North Kalimantan Provincial Government. The Punan Adiu community has registered their objection to the planned re-opening of the road which is intended to service logging concessions outside the PACT, and will continue to challenge its development. If this challenge is unsuccessful however, road construction could cause up to 60 ha of deforestation within the PACT, reducing the climate benefits for the project period by up to 18.5%.

Expected effectiveness

Because of the potential for agricultural expansion, opening fallows, and road building to reduce the effectiveness of project activities at avoiding emissions from deforestation and degradation by up to 20%, it is not assumed that the project will be able to prevent all of baseline deforestation and forest degradation. Instead, **an expected effectiveness (F) of 75% is adopted for the first project period**, to account for potential emissions from agricultural expansion, opening fallows and road building, as well as any unavoidable or unexpected events that could affect the project area.

At the end of the project period, analysis of remote sensing data will be used to estimate the actual percentage of emissions from deforestation and forest degradation avoided, and for subsequent project periods a value of F will be adopted to reflect the observed effectiveness of project activities in previous periods (see AA-CFREDD Section 3.2.2; Annex 6).

G.5.2 Expected climate benefits

Expected climate benefits are estimated using the equation in AA-CFREDD Section 3.1.4 (see Annex 6) and the parameters described in Sections G.4.3, G.5.1, and G.6.2. The calculated

parameters and values are summarised in Table 23 , and the calculations are provided in Annex 8. **Expected annual climate benefits for the first project period are 55,216 Mg CO_2 per year.**

Table 23 Parameters for estimation of climate benefits during the project period

Parameter	Value	Source
Baseline scenario emissions from deforestation and forest degradation expected during the project period (E_{BL})	458,560 Mg CO_2	See Section G.4.3
Expected project scenario emissions from deforestation and forest degradation expected during the project period (E_{PS})	114,640 Mg CO_2	25% of E_{BL} (See Section G.5.1)
Leakage emissions expected to result from displacement of deforestation and degradation during the project period (E_{LK})	17,196 Mg CO_2	See Section G.6.2
Climate benefits expected to result from reduced deforestation and forest degradation as result of project activities during the project period (B)	326,724 Mg CO_2	AA-CFREDD Equation 16 (see Annex 8)

G.6 Leakage and uncertainty

G.6.1 Leakage methodology

The methodology for estimating expected leakage emissions is described in AA-CFREDD Section 3.3.1 (see Annex 6). The project will adopt the expected leakage approach (Option 3.3.1b) for estimating expected leakage. Following this approach, expected leakage emissions are estimated for the first project period as a proportion of the difference between baseline scenario and project scenario emissions. A conservative estimate for the proportion of leakage expected (L) is determined based on an assessment of potential for displacement of activities that are expected to cause deforestation and forest degradation in the project area under the baseline scenario.

Potential drivers of leakage include all natural resource use activities, with the potential to cause deforestation or forest degradation, that will be reduced within the project area as a result of project activities and that have potential to be displaced. Potential for displacement also depends on the agents of deforestation and degradation linked to specific drivers. The agents and drivers with potential to cause leakage, and areas that could be affected by displacement are summarised in Table 24.

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Table 24 Potential agents and drivers of leakage

Agent	Driver	Displacement potential	Justification
Timber companies	Commercial logging operations	None	Although the project aims to prevent the activities of timber, mining and oil palm companies within the project area, this is not expected to result in increased logging mining or expansion of oil palm plantations outside the project area since all potential logging, mining and oil palm concessions in the region have been allocated and will be activated if they are commercially viable. The project activities therefore do not have the potential to increase commercial timber extraction, mining or oil palm expansion outside the project area.
Mining companies	Mining operations	None	
Oil palm companies	Expansion of oil palm plantations	None	
Punan Long Adiu Community	Unsustainable timber harvesting	None	Punan Adiu community's use of timber from within PACT is limited to construction of boats for their own use, and for house construction. Since the community has only 32 households, their timber requirements are not expected to exceed sustainable levels of exploitation that will fall within level of harvest allowed by village regulations. There is therefore no potential for displacement.
	Expansion of smallholder agriculture	None	Village regulations will allow expansion of agricultural areas for new families from the Punan Adiu community, but will prevent the expansion of other agricultural areas into areas that are not currently used for shifting cultivation. The areas currently used are sufficient to meet the needs of the community and displacement of agricultural expansion to areas outside the PACT is not expected.
Neighbouring village communities	Unsustainable timber harvesting	None	Neighbouring villages recognise the PACT and do not harvest their timber or open agricultural fields within the project area, Timber harvesting by other local communities will be controlled by village regulations. It is unclear how much timber is currently illegally extracted from the project area, but levels are relatively low and displacement is not expected to cause significant degradation outside the project area, and would be limited to areas that are easily accessible.
	Expansion of smallholder agriculture	None	Under baseline and project scenarios, part of the PACT is allocated for agricultural use by neighbouring communities. Project activities will not affect this area so there is no potential for displacement.

Agent	Driver	Displacement potential	Justification
Outsiders	Illegal timber harvesting	Minimal	Occasional encroachment into the PACT by individuals from distant communities to harvest timber and open agricultural fields has occurred in the past. Project activities that aim to prevent these incursions could displace these activities to other forest areas in Malinau District. The small scale of these activities means that any leakage created will be minimal and is unlikely to be significant in comparison to the emission reductions achieved by the project.
	Agricultural encroachment	Minimal	

Since there is little potential for leakage from the major drivers of deforestation and forest degradation, **an expected leakage emissions proportion (L) of 5% will be adopted for the first project period**. At the end of the project period, analysis of remote sensing data will be used to estimate the actual emissions from leakage in a leakage area within 5km of PACT, and for subsequent project periods a value of L will be adopted to reflect the leakage observed in previous project periods using the leakage area approach (see AA-CFREDD Section 3.3.2b; Annex 6).

G.6.2 Potential leakage

Potential leakage emissions are estimated using the equation in AA-CFREDD Section 3.3.1b (see Annex 7) and the parameters described in Section G.6.1 (see Table 25). The calculations are provided in Annex 8. **Potential leakage emissions for the first project period are 3,439 Mg CO_2 per year.**

Table 25 Potential leakage emissions parameters

Parameter	Value	Source
Leakage emissions expected to result from displacement of deforestation and degradation during the project period (E_{LK})	17,196 Mg CO_2	AA-CFREDD Equation 11 (see Annex 8)

G.6.3 Sources of uncertainty

There are a number of sources of uncertainty associated with the data and assumptions used to estimate climate benefits. The main sources of uncertainty and approaches used to reduce uncertainty are summarised below.

Data

Two main types of data source are used in the estimation of climate benefits: Land cover maps, and carbon density estimates. The accuracy of land cover maps was assessed with in-situ validation, and was typically >80% (see Annex 7). The accuracy of land cover change maps is likely to be lower since they will reflect errors in both of the maps being compared. Considerable effort was made to reduce error and the resulting maps are considered to provide descriptions of land cover and land cover change with an acceptable level of uncertainty.

Estimates of carbon density also have uncertainty associated with the values used, which were derived from an extensive review of relevant studies in the region. The average values adopted for the land cover types have a standard deviation associated with the survey from which they were collected, and from the combination of data from a number of different surveys. If this uncertainty was reflected in the estimates used, for example by using a lower 90% confidence interval of the mean, it would be likely to result in a considerable under-estimate of carbon stocks. Instead, the mean values are adopted as these are expected to give the most accurate reflection of carbon stocks in the appropriate land cover types. It is unlikely that field surveys at the project site would reduce this uncertainty, since surveys of a small number of relatively small plots generally result in estimates with high levels of uncertainty, and the survey effort required to obtain higher precision is typically prohibitive for small-scale projects.

Assumptions

Although it is not possible to quantify the uncertainty of assumptions used to estimate expected climate benefits, it is likely that the uncertainty from this source is greater than for the data used. The project therefore employs a number of approaches to prevent the uncertainty associated with assumptions used in the climate benefit estimation methodology from resulting in an over-estimate of climate benefits.

Expected baseline scenario emissions are estimated by assuming that the patterns of deforestation and degradation that occurred in the reference region during the reference period would occur in the project area during the project period, if project activities are not carried out. If baseline emissions are overestimated, this could result in an over-estimation of climate benefits. To reduce the likelihood of overestimating baseline emissions, only deforestation and forest of the same type, and legal classification as forest in the project area is considered when considering patterns of deforestation and forest degradation in the reference region. Actual deforestation and degradation that occurred in the reference region during the project period is also used to verify emission reductions achieved.

The project scenario assumes that project activities are effective at preventing the deforestation and degradation expected under the baseline scenario. A suite of activities was developed to address specific drivers of deforestation and degradation in the project area increasing the likelihood that the project activities will result in the expected benefits if carried out as planned. Some uncertainty remains however, so a conservative estimate of expected effectiveness is applied to intentionally bias the estimate of climate benefits so that they are likely to be underestimated. During the project period, activity-based monitoring and adaptive management will be used to ensure that the project activities remain relevant to changing conditions. After the project period, climate benefits will be verified and by assessing the amount of deforestation and degradation that occurred during the project period.

There is also uncertainty associated with the estimation of leakage, and again a conservative estimate of expected leakage is applied to reduce the likelihood that leakage is underestimated prior to verification at the end of the project period.

G.6.4Validation of assumptions

The main assumption of the project is that if the activities are carried out as planned, they will result in the expected climate benefits. Two types of approach will be used to collect data to validate this assumption: i) Activity-based monitoring throughout the project period to determine whether activities are being carried out as planned; and ii) Verification of climate benefits, and updating key parameters at the end of the project period.

Activity-based monitoring indicators, and indicators used to verify climate benefits, are described in Section K.1.1.

H. Risk Management

To help ensure the environmental integrity of emission reductions achieved by the project, for which Plan Vivo certificates are issued, a proportion of certificates will be held in a risk buffer. The proportion of certificates in the risk buffer is determined by consideration of two types of risk: i) The risk that project activities will not result in the expected climate benefits during the project period; and ii) that climate benefits achieved during a project period will be reversed after the end of the project.

Risk buffer certificates will be retired at the end of the project period if verified climate benefits fall below the benefits estimated at the start of the project period; thereby insuring against under-delivery during the project period and reversals of climate benefits achieved in previous project periods. Any risk buffer certificates that remain at the end of the project (i.e. after the last project period) will be maintained in the Plan Vivo pooled buffer account.

H.1 Identification of risk areas

H.1.1 Risk assessment methodology

To ensure that the number of certificates held in the risk buffer is proportional to the risks of non-delivery and reversal of climate benefits, the level of risk in five key areas is considered, to provide an overall assessment of the risk levels. The categories of risk considered are: Social; Economic; Environmental; Technical; and Administrative. Within each of these categories, specific risk factors were identified. Project activities were designed to mitigate the identified risks as far as possible. The level or risk that remains after the application of these mitigating activities was scored for: i) impact – the proportion of climate benefits that would be lost if the risk factor was realised; and ii) likelihood – the probability of the risk factor occurring. Both impact and likelihood were scored on a five-point scale: Very low = 0.05, Low = 0.1, Moderate = 0.25, High = 0.5, Very high = 0.75.

The risk score for each risk factor was then calculated by multiplying impact and likelihood scores, and a total risk score was calculated by summing the risk scores for each factor. The total risk score was used to determine the proportion of certificates held in the risk buffer.

The risk assessment will be reassessed at the start of each project period, and updated if appropriate by revision of this PDD.

H.1.2Risk assessment result

The results of the assessment of risks of non-delivery and reversals of climate benefits are summarised in Table 26.

Table 26 Assessment of risks of non-delivery and reversal of climate benefits

Risk	Mitigation actions	Impact	Likelihood
Social			
Legal recognition - Application for legal recognition customary forest is rejected.	The activities required to secure legal recognition are included in the management plan, and therefore progress towards legal recognition is included as an activity-based indicator. If the application is rejected, or progress towards recognition is not made, certificate issuance will be withheld.	High - If rejected, there would be a significant impact on the success of the project and potential for reversals. Potential for non-delivery of benefits for which certificates have been issued is limited by activity-based indicators.	Low - The Punan Adiu community have a strong claim to their customary territory, and the legal process is available to have this legally recognised. However, there may be reluctance to assign customary forest in areas with conflicting claims.
National legislation - Transaction of emission reduction credits is prevented or controlled by national legislation. The Government of Indonesia is currently developing legislation governing carbon and ecosystem service transactions, which could limit the potential for the project to raise finance through sale of emission reduction certificates in the voluntary carbon market.	The marketing strategy for the project is not solely reliant on the sale of carbon offsets. Having a diverse range of funding sources will enable the project to respond to emerging legislation. Furthermore, Plan Vivo agreements will only be entered into when finance for the period of the agreement is secured.	Very Low - Since Plan Vivo agreements will only be entered into once finance has been secured, there is no risk of non-delivery. The Government of Indonesia maintain a commitment to reducing emissions from deforestation and forest degradation and supporting social forestry initiatives, so it is unlikely that legislative change would lead to reversals in benefits achieved.	High - There is a high likelihood that legislation relating to carbon and ecosystem services will come in to force during the first project period.

Risk	Mitigation actions	Impact	Likelihood
Community support for the project is not maintained.	The aims of the project are well aligned with the ambitions of the Punan Adiu community, and it is expected that support will be maintained for the five-year project period, and that benefits from sustainable forest management will encourage forest protection after the end of the project. The commitment during the project period will be tracked with activity-based indicators, to reduce the potential for under-delivery.	Moderate - A lack of support would have a significant impact on the success of the project but reversals are unlikely as the Punan Adiu community benefit from forest protection. The potential for non-delivery of benefits for which certificates have been issued is limited by activity-based indicators.	Low - The likelihood that support will not be maintained for the project period is low; and the likelihood of reversals is limited by the reliance of the community on forest resources for their livelihood activities, which the project aims to enhance.
Economic			
Insufficient finance is secured to support project activities creating a risk of non-delivery and reversals.	Plan Vivo agreements will only be signed when finance for the period of the agreement is secured, reducing the risk of non-delivery. Reversals are not expected if the project is terminated early as the Punan Community will continue to benefit from forest protection.	Low - A lack of finance will not affect delivery of climate benefits from certificates that have been issued, and would have a very low impact on reversals.	Moderate - Markets for certificates from this type of project are fairly young and sales not certain.
Alternative land uses such as logging, mining or oil palm become more attractive to the local community.	Project activities support the Punan Adiu community wish to prevent logging, mining and oil palm in their community forest.	Moderate - If alternative land uses were adopted during a project period they could affect the delivery of benefits in that period, and also have the potential to generate reversals.	Very low - There is a very low chance this would happen during the first project period as the Punan Adiu community has expressed a strong commitment to forest protection.
Environmental			

Risk	Mitigation actions	Impact	Likelihood
Force majeure e.g. fire, or extreme weather or geological events could prevent delivery of benefits and cause reversals.	Firebreaks will be established along boundaries of the PACT.	Very low - There is no history of widespread damage from wildfire, high winds or earth quakes in the project area.	Very low - Force majeure are rare in the project area.
Technical			
Project activities fail to prevent encroachment by outsiders.	Project activities including boundary marking and patrols are designed to prevent encroachment by outsiders.	Low - Encroachment by outsiders is not expected to be a major cause of deforestation and degradation.	Low - If project activities are carried out as planned there is a high likelihood they will deter encroachment by outsiders.
Technical capacity to implement project activities is not maintained.	Training project activity groups is a key focus of project activities, and capacity will be monitored throughout the project and linked to activity based indicators.	Low - The link with activity-based indicators reduces the potential for lack of capacity to prevent delivery of the project.	Low - Training is a key focus of project activities.
Administrative			
Capacity of the project coordinator to support the project is not maintained.	The project coordinator has received training required and will have support of technical partners throughout the project period.	Low - Training provided to the project coordinator limits the impact from a lack of maintenance of capacity.	Very low - Technical support partners will ensure that the necessary capacity is maintained.

H.2 Risk buffer

H.2.1 Risk buffer percentage

The risk buffer percentage was calculated using the approach and risk analysis described in Section H.1. The risk values for the different risk factors identified are summarised in Table 27. **The risk buffer percentage for the project period is 15.5%.**

Table 27 Risk scores

Risk factor	Risk score		
	Impact	Likelihood	Total
Social			
Legal recognition	50%	0.1	5.0%
National legislation	5%	0.5	2.5%
Community support	25%	0.1	0.25%
Economic			
Insufficient finance	10%	0.25	2.5%
Alternative land use	25%	0.1	2.5%
Environmental			
Force majeure	5%	0.05	0.25%
Technical			
Project activities	10%	0.1	1.0%
Technical capacity	10%	0.1	1.0%
Administrative			
Project coordinator	10%	0.05	0.5%
TOTAL			**15.5%**

I. Project Coordination & Management

I.1 Project organisational structure

I.1.1 Stakeholder analysis

To identify external groups with potential to influence or be affected by the project, three types of stakeholder were considered:

- Local administrative bodies
- Local or national organisations and donors working on natural resource management
- Private sector organisations, especially those involved in agriculture, forestry and extractive industries

Fifteen potential stakeholders in addition to the Punan Long Adiu community, were identified (see Table 28). Each stakeholder was assessed to determine whether they are likely to be positively or negatively impacted by the project and scores were assigned from 1 to 5 for i) Importance - where 5 = stakeholders whose needs the project should consider the highest priority, and 1 = stakeholders whose needs are the lowest priority for the project; and ii) Influence - where 5 = stakeholders with the greatest power to facilitate or impede the project, and 1 = stakeholders with the least power to influence the project. A positive or negative score was awarded according to whether the stakeholders would be positively or negatively impacted by the project. The main stakeholders who will benefit from the project are the Punan Adiu community. External stakeholder with the greatest potential to positively influence the project are the district administration who have been involved in the development of the project and will continue to be involved in its implementation through periodic meetings with LP3M. Logging, Mining and Oil Palm companies with concessions within PACT may be negatively impacted by the project, but the impacts are unlikely to be significant in relation to the total income of these companies.

Table 28 Stakeholder table for Punan Long Adiu Village

Stakeholder	Interest in project	Impact	Importance	Influence
Local administration				
DPRD Malinau	People's representative	+	1	2
Bupati	The policies have been made pro- and beneficial to Punan Adiu people	+	2	2

Stakeholder	Interest in project	Impact	Importance	Influence
NGO				
Church	Religious institution who has brought good influence for Punan Adiu people, including the relationship with nature	+	2	2
Fisip-UI	Documentation on Punan Adiu and disseminate information on Punan people to the world	+	2	2
LP3M	Institution who has been facilitating Punan Adiu for the more than 10 years, introduce how to protect Punan wisdom and disseminate information on Punan Adiu wisdom in conserving the nature	+	2	2
Padi Indonesia	An NGO that facilitated participatory mapping on Punan Adiu Customary Territory and supported the development of district/Bupati regulation peraturan on customary institution	+	1	2
CIFOR	A research institution that conducted mapping in Setulang area and surrounding including Punan Adiu's territory and has brought the awareness of land ownership	+	1	0
ADB	ADB is expected to support the community in protecting their area for Punan Adiu people's livelihood and the sustainability of forest resources	+	1	2
Mongabay	Documentation on Punan Adiu and disseminate information on Punan people to the world	+	2	2
KOMPAS-TV	Documentation on Punan Adiu and disseminate information on Punan people to the world	+	2	2
Telapak Indonesia	Initial documentation on Punan Adiu people & area and among the first organizations that introduced to Punan Adiu people	+	0	2
NTFP-EP	Facilitated Punan Adiu people for the last few years through LP3M, including facilitating the participatory mapping together with AMAN and JKPP/SLPP, also documenting Punan Adiu's knowledge and made some publication.	+	2	1
Private sector				
PT. Kayan Putra Utama Coal (Coal Mining)	Coal mining at upstream of Malinau River, polluting the air and water so that Punan Adiu people can not use Malinau river water for daily consumption anymore	-	-1	0
PT. Bara Bina Muda Sukses (Coal Mining)	Coal mining at upstream of Malinau River, polluting the air and water so that Punan Adiu people can not use Malinau river water for daily consumption anymore	-	-1	-2

Stakeholder	Interest in project	Impact	Importance	Influence
PT. Rimba Makmur Sentosa (IUPHHK-HA)	Logging concession that cut trees which are protected by Punan Adiu people for honey and other NTFP.	-	-1	-2

I.1.2 Project coordinator

The project coordinator is *Lembaga Pemerhati dan Pemberdayaan Dayak Punan Malinau* (LP3M), a Malinau-based NGO established in 2005 to prevent environmental degradation, and loss of rights from Punan customary communities expected to result from the Governor of East Kalimantan's land program for oil palm expansion which included conversion of 200,000 hectares of primary forest in Malinau District to plantations.

The capacity and experience of the LP3M are summarised in Table 29. Contact details of key personnel are in Annex 9.

Table 29 Project coordinator profile

Name and role in project: *Lembaga Pemerhati dan Pemberdayaan Dayak Punan Malinau* (LP3M; Project Coordinator)
Legal status: National NGO formalized as a legal body in August 5, 2005 through a notarial act No 27 from Darmawin Dahram SH Notary in Tarakan, East Kalimantan
Long-term objectives: To ensure that Punan Customary Communities obtain benefit from sustainable forest management. In order to achieve this long-term objective, there are four programs: a) policy advocacy and natural resources issues, b) strengthening and facilitating community groups, c) prosperity improvement, and d) network development.
History and achievements: After established in June 2005, the first activity of LP3M to host a seminar on the impact of large scale oil palm plantation on shifting cultivation communities in East Kalimantan, in January 2006. This Seminar raised communities' awareness of the importance of protecting the natural forest for their own livelihood. Building on this LP3M has helped to support communities rejecting large scale oil palm plantations in Bulungan, Nunukan, and Tana Tidung Districts. Notable achievements include initiating and supporting the issuance of the following local regulations: 1) District Regulation (*Peraturan Daerah/Perda*) on the Protection of Customary Communities was issued in October 3, 2012. This Perda is one of initiative rights of Malinau House of Representative (DPRD Malinau) with Komnas HAM (Komisi Nasional Hak Asasi Manusia/National Commission for Human Rights) and AMAN (Aliansi Masyarakat Adat Nusantara/Indigenous Peoples Alliance of the Archipelago). 2) District Head/*Bupati* Regulation on the Malinau District's Management Agency for Customary Community Affairs was issued in November 19, 2014. This Bupati Regulation was issued in collaboration between Malinau District Government with Padi Indonesia, LP3M, and financially supported by The Asia Foundation. 3) A Bupati Decree on the Recognition and protection of Punan Long Adiu Customary Law Community as Unity of the Customary Law Communities in Malinau District has been signed on May 8, 2017. LP3M facilitated this process since 2015 with the Malinau District Government.
Key personnel: • Boro Suban Nikolaus (Director & Advocacy Program Coordinator) • Wilibaldus (Secretary) • Martini Neneng (Treasurer)

- Randy Anggara (Prosperity Improvement Division Head)
- Theodorus GOB (Network Development Division Head)
- Amin Jaffar (Strengthening and Facilitating Community Groups Division Head)
- Theodorus GOB (Policy and Natural Resources Issues Advocation Division Head)

I.1.3 Organisational structure

The organisational structure for the project is described in Figure 12.

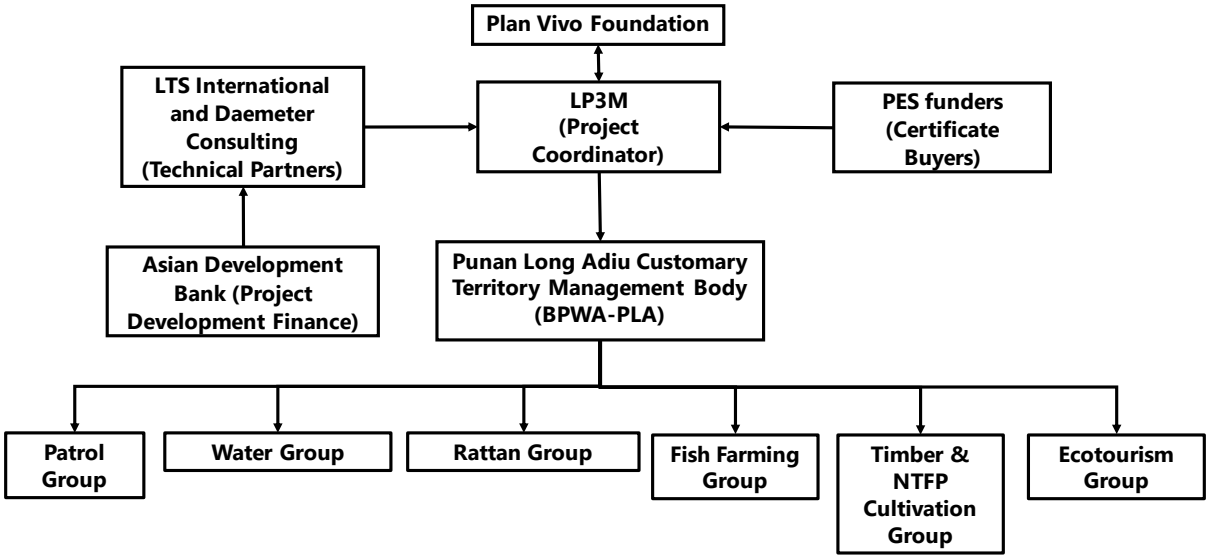

Figure 12 Organisational structure

I.2 Relationships to national organisations

I.2.1 Communication with national organisations and government

As described in Section G.1.3 on recognition of the customary community and their customary territory, the project coordinator will closely monitor the process to obtain the legal stipulation of forest areas within PACT as a customary forest and inclusion of the customary forest in the forest area map. Communication with the District and Provincial Governments as well as the MoEF will be conducted as necessary. A dialogue with the National Forestry Council (*Dewan Kehutanan Nasional*) has also been established and will be maintained by the project coordinator.

Meanwhile, Malinau District Government is also preparing the District Regulation Bill on Payments for Environmental Services, which the project coordinator is facilitating. This will become the umbrella District regulations governing implementation of greenhouse-gas emission reduction activities conducted by the BPWA and the project coordinator, while national legislation is being developed.

I.2.2 Links to other government schemes or projects

Fish farming activities that will be implemented in Sigong Kelafang Lake by the fish farming group of BPWA have been discussed with the Malinau District Agriculture, Fishery and Livestock Service (*Dinas Pertanian, Perikanan, dan Peternakan*) and Malinau District Environmental Service (*Dinas Lingkungan Hidup*). The two institutions have expressed their interest to link their programs with this fish farming activity and will provide necessary support, for example by assigning one extension officer who will guide the community in fish farming activities and provide assistance in developing the ecotourism (nature school) in Sigong Kelafang area.

A similar process has been followed for water provision from Garing River. The BPWA water group and project coordinator have communicated with the District Planning Agency (*Badan Perencanaan Pembangunan Daerah*; Bappeda) to seek information on the District's clean water provisional program. A relevant national program for Community-Based Drinking Water and Sanitation Provision (*Penyediaan Air Minum dan Sanitasi Berbasis* Masyarakat)[26] has been identified and the Bappeda has allocated one program for the Punan Long Adiu community in 2018. However, this program will only cover part of the establishment of the water facilities and therefore the community and project coordinator still need to find other funding sources.

I.3 Legal compliance

I.3.1 Compliance with legal requirements

National and regional regulations and legislation relevant to the proposed project activities are summarised in Table 30. The project will act in compliance with these, and other relevant regulations.

The first step to comply with legal requirements for the project area was to obtain a Bupati Decree on recognition and protection of Punan Long Adiu Customary Community, which was signed on 8 May 2017 (see Annex 10). This is to comply with Malinau District Regulation

[26] http://mis.pamsimas.org/map/

(Perda No. 10 Tahun 2012) on recognition and protection of the rights of customary communities in Malinau District (*Pengakuan dan perlindungan Hak-hak masyarakat adat di Kabupaten Malinau*), which provides the rights for the community to manage their customary territory.

The project was designed in collaboration with the Directorate of Ecosystem Services on Conservation Areas (DESCA), which is a Government agency under the Indonesian Ministry of Environment and Forestry (*Kementerian Lingkungan Hidup dan Kehutanan*).

DESCA is the implementing agency for the ADB funded project that is supporting the development of a Plan Vivo Project in Punan Long Aidu Village. When Punan Adiu was selected as a Plan Vivo project site, DESCA circulated a letter of notification to all relevant regulatory bodies and NGOs active in the area, including national and district authorities and local international organisations. A copy of the letter, and list of addressees is provided in Annex 10.

Table 30 Relevant regulations and legislation

Type	Reference	Title
Forest carbon		
Regulation of the Minister of Forestry	P.68/Menhut-II/2008	Penyelenggaraan Demonstration Activities Pengurangan emisi dari Deforestasi dan Degradasi Hutan
Regulation of the Minister of Forestry	P.36/Menhut-II/2009	Peraturan Menteri Kehutanan tentang Tata Cara Perizinan Usaha Pemanfaatan Penyerapan dan/atau Penyimpanan Karbon pada Hutan Produksi dan Hutan Lindung
Regulation of the Minister of Forestry	P.30/Menhut-II/2009	Tata Cara Pengurangan Emisi dari Deforestasi dan Degradasi Hutan (REDD)
Regulation of the Minister of Forestry	P. 20/Menhut-II/2012	Penyelenggaraan Karbon Hutan
Regulation of the Minister of Forestry	P.11/Menhut-II/2013	Perubahan atas Permenhut No. P.36/Menhut-II/2009
Regulation of the Minister of Forestry	P.50/Menhut-II/2014	Perdagangan Sertifikat Penurunan Emisi Karbon Hutan Indonesia atau *Indonesia Certified Emission Reduction*
Local governance		
Law	UU No. 23/2014	Pemerintahan Daerah
Government Regulation in Lieu of Law	Perpu No. 2/2014	Perubahan atas UU No. 23/2014
Law	UU No. 2/2015	Penetapan Perpu No. 2/2014 sebagai Undang-undang
Law	UU No. 9/2015	Perubahan kedua atas UU No. 23/2014 tentang Pemerintahan Daerah

Type	Reference	Title
Regulation of the Minister of Forestry	P.7/Menhut-II/2012	Penugasan (medebewin) sebagian urusan pemerintahan bidang kehutanan tahun 2012 kepada Bupati Berau, Bupati Malinau, dan Bupati Kapuas Hulu dalam rangka *Demonstration Activities REDD*
Regulation of the Minister of Forestry	P.25/Menhut-II/2012	Petunjuk telnis pelaksanaan Penugasan sebagian urusan pemerintahan bidang kehutanan tahun 2012 kepada Bupati Berau, Bupati Malinau, dan Bupati Kapuas Hulu dalam rangka *Demonstration Activities REDD*
Regulation of the Minister of Forestry	P.102/Menhut-II/2014	Pedoman pelaksanaan penugasan sebagian urusan pemerintahan bidang kehutanan tahun 2015 kepada Bupati Berau, Bupati Malinau dan Bupati Kapuas Hulu dalam rangka pengelenggaraan Program Hutan dan Perubahan Iklim (*Forest and Climate Change*)
Non-Timber Forest Products		
Regulation of the Minister of Forestry	P.35/menhut-II/2007	Hasil Hutan Bukan Kayu
Regulation of the Minister of Forestry	P.19/Menhut-II/2009	Strategi pengembangan Hasil Hutan Bukan Kayu Nasional
Regulation of the Minister of Forestry	P.21/Menhut-II/2009	Kriteria dan indikator penetapan jenis Hasil Hutan Bukan Kayu Unggulan
Customary forests		
Regulation of the Minister of Agriculture/Head of National Land Agency	Permenagraria No. 5 tahun 1999	Pedoman penyelesaian masalah hak ulayat masyarakat hukum adat
Regulation of the Minister of Agriculture/Head of National Land Agency	Permenagraria No. 9/1999	Tata cara pemberian dan pembatalan hak atas tanah negara dan hak pengelolaan
Circular of the Ministry of Forestry	S.75/Menhut-II/2004	Surat Edaran Masalah Hukum Adat dan Tuntutan kompensasi/Ganti Rugi oleh Masyarakat Hukum Adat
Circular of the Ministry of Forestry	SE.1/Menhut-II/2013	Putusan Mahkamah Konstitusi No. 35/PUU-X/2012 tanggal 16 Mei 2013
Regulation of the Minister of the Interior	Permendagri No. 52 Tahun 2014	Pedoman pengakuan dan perlindungan masyarakat hukum adat
Joint Regulation of the Minister of Home Affairs, the Minister of Forestry, Minister of Public Works, and the Head of National Land Agency	No. 79 Tahun 2014 PB.3/Menhut-II/2014 No. 17/PRT/M/2014 No. 8/SKB/X/2014	Tata cara penyelesaian penguasaan tanah yang berada di dalam kawasan hutan
Malinau District Regulation	Perda No. 10 Tahun 2012	Perngakuan dan perlindungan Hak-hak masyarakat adat di Kabupaten Malinau
Malinau Regency Regulation	Perbup No. 201 tahun 2014	Badan Pengelola Urusan Masyarakat Adat Kabupaten Malinau

Type	Reference	Title
Decree of the Regency of Malinau	SK No. 144/K.28/2015	Penetapan pemberian tunjangan pengurus lembaga adat kaupaten dan lembaga adat kecamatan dalam wilayah Kabupaten Malinau Anggaran 2015
Regulation of the Minister of Environment and Forestry	P.83/MENLHK/SETJEN/KUM.1/10/2016	Social Forestry

I.3.2 Project coordinator policies

In its establishment document[27], the project coordinator organization has determined that it is open to any individual who has serious attention and commitment to Dayak Punan ethnic group and is willing to work and become a member of the organization upon the compliance to its vision, mission, and goals as well as other national legal requirements.

The project coordinator organization staff whose salary is above the minimum salary for paying income tax must have a tax ID number and pay the income tax as necessary.

I.4 Project management

I.4.1 Project timeline

A timeline showing the project development phase and the first two project periods is provided in Figure 13. The start date of the project is 1 Jan 2018, and the project will seek its first certificate issuance on submission of an annual report in December 2018. Ex-post certificates will then be issued each year on acceptance of annual reports submitted to the Plan Vivo Foundation.

[27] Notarial Act No. 27, dated August 5, 2005 from Darmawin Dahram, SH Notary

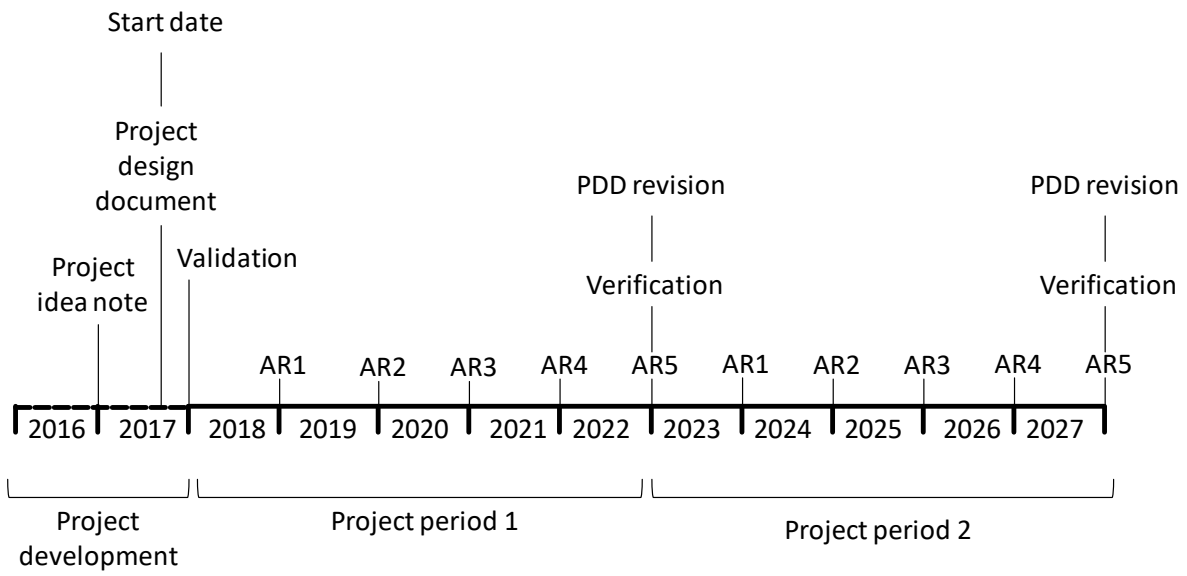

Figure 13 Project timeline. AR = Annual Report.

I.4.2 Record keeping

The project coordinator will maintain records of project documents, management plans, and reports received from project activity groups as paper copies with electronic versions stored on a hard drive and backed up on a cloud-based server. Full financial records of all project transactions will be maintained by the project coordinator and made available on request. All monitoring data, and information needed for annual reporting will be stored in a project database (see Annex 11).

I.4.3 Sales and marketing

The project coordinator will be responsible for marketing the project to potential funders, negotiating sales agreements with certificate buyers, processing sales, and recording transactions on Markit environmental registry. A full marketing plan for the project is currently under development, as described in Section I.6.

I.5 Project financial management

I.5.1 Budget and financial plan

A full financial plan has been developed for the first project period, including all costs associated with implementing activities in the management plan (see Annex 1), and the administration costs incurred by the project coordinator and technical partners. This plan will be reviewed and updated throughout the project period. The proportion of project implementation and management costs incurred by the community groups, project

coordinator and technical partners will be used to define the benefit sharing mechanism (see Section J.2.1).

The total cost includes the first year of the project, during which costs are relatively high since much of the training and equipment needed to implement project activities will be provided. There will also be no Plan Vivo certificates available during the first year of the project, since the project will seek *ex-post* certificates for emission reductions achieved at the end of each year (see Section I.4.1). Funding for the first year of project implementation will therefore be sought from a donor that does not require Plan Vivo certificates, after which finance from the sale of certificates issued at the end of the year will be used to fund the following year of project activities. Approaches that will be used to raise this finance are described in Section I.6.

I.5.2 Mechanism for disbursement of funds

All project funds from the sale of Plan Vivo certificates, or other means of finance, will be received by the project coordinator in a dedicated bank account that requires at least two signatories for all transactions. This bank account will be separate from the project coordinators organisational account and will be used solely for managing project finances.

The project coordinator will be responsible for contracting trainers, technical specialists, and verifiers as required to implement the management plan and fulfil all monitoring and reporting requirements. The project coordinator will also be responsible for purchasing equipment required for community groups to implement the activities described in the management plan, and disbursing this equipment in line with the schedule described in the benefit sharing mechanism (see Section J.2.1) and Plan Vivo agreement (see Section J.1.1).

Cash payments to community groups will be made every month based on budget proposals needed for the next month. Meanwhile, salary to each patrol team member will be made to dedicated bank accounts established for each person. All amounts disbursed from group accounts will be recorded and reported to the project coordinator at quarterly meetings.

I.6 Marketing

I.6.1 Marketing plan

For the first year of project implementation, donor finance that is not linked to the issuance of Plan Vivo certificates will be sought. This will enable the project to begin operations, and to start receiving ex-post certificates at the end of the first year. The first year of the project therefore provides the project coordinator with the opportunity to identify and build relationships with potential funders, and secure agreements to support the project. Performance-based finance for the project will be sought from three main sources:

- Sale of Plan Vivo certificates to buyers whose primary motivation is to offset their greenhouse gas emissions, and/or to make a contribution to climate change mitigation by reducing emissions from deforestation and forest degradation (REDD);
- Finance from funders whose primary motivation is to conserve biodiversity by supporting community forest management that contributes to the maintenance of habitat quantity and quality for threatened and endangered species; and
- Finance from companies whose activities have incurred a deforestation or conservation liability and that wish to support a project that will contribute to conservation of a particular area, or prevent a known amount of deforestation or forest degradation, to remove this liability.

For all types of performance-based finance, a cost-based model will be used with the aim of raising the finance needed to cover the implementation and management costs and fund contributions summarised in Section I.5.1.

A minimum certificate price will be set at the level needed to cover the costs of project implementation and management if all certificates are sold. If income is raised above implementation and management costs, any surplus generated will be transferred to a fund managed by the BPWA to be used to provide additional support to forest management groups, to contribute to village development, and to facilitate neighbouring communities to pursue recognition of their customary territories and develop plans for sustainable management.

In addition to representing a 1 tonne of CO_2 emission reduction, each Plan Vivo certificate will also be associated with sustainable management of 0.05 ha of forest habitat for one year, and prevention of 0.001 ha deforestation and 0.001 ha of forest degradation.

In addition to marketing Plan Vivo certificates for reduction of CO_2 emissions, the project can therefore also be marketed through the following performance-based metrics.

- Supporting sustainable management of forest habitat, based on the number of hectares protected; and
- Preventing deforestation, based on hectares of deforestation avoided.

A full marketing plan for accessing finance for the project from these different sources, using the most appropriate performance-based metrics, will be developed during the first year of project implementation.

I.7 Technical support

I.7.1 Capacity development

Developing capacity of the community groups to effectively protect their forest and generate an income from sustainable forest management is a main aim of the project activities. Training needs were identified during the project development phase, and required training has been incorporated into the management plan. The capacity of forest patrol and monitoring groups will be continually assessed throughout the project period, and additional training will be provided as required.

I.7.2 Ongoing technical support

The project coordinator will receive support from the technical partners (see Annex 9) throughout the first project period, to assist with validation of the project, annual reporting, verification, and updating the PDD prior to the second project period.

J. Benefit sharing

J.1 Plan Vivo agreements

J.1.1 Plan Vivo agreement procedures

A Plan Vivo agreement template was prepared during the project development phase (see Annex 3). This agreement will include details of project activities to be carried out by different activity groups, activity-based indicators that will be monitored and thresholds that must be met to receive the support described in the agreed benefit sharing mechanism (see Section J.2.1). Representatives of all project activity groups were involved in drafting this agreement, and the agreed version has the support of the community.

J.1.2 Risks and mitigation measures

There are two main sources of risk associated with the Plan Vivo agreements: i) the risk that community groups will not meet their obligations for carrying out project activities; ii) that the project coordinator will not be able to provide the support agreed in the benefit sharing mechanism. These risks will be mitigated through activity-based monitoring, and by securing required finance before entering into Plan Vivo agreements, and tracking costs and updating financial plans and pricing strategy throughout the project period, as described below.

Activity-based indicators (see Section K.1.1) will be tracked by the project coordinator on a quarterly basis, and reported each year in an annual report to the Plan Vivo Foundation. If monitoring of activity-based indicators suggests that annual thresholds will not be met, the project coordinator will provide the support needed to ensure that activities are carried out as described in the management plan.

Plan Vivo agreements will only be signed when sufficient finance has been secured. If finance for the whole project period is not available, then the period covered by the agreement will be adjusted, so that it only covers the period for which funding is available. When additional finance is secured the agreement will then be extended up to the length of the full project period. To help ensure that the finance available is sufficient to support the project activities, financial plans will be reviewed regularly and updated as required. When adjustments are made, the pricing strategy for Plan Vivo certificates and other types of support (see Section I.6.1) will be updated accordingly.

J.2 Payments and benefit sharing

J.2.1 Benefit sharing mechanism

The allocation of finance among the different parties will be different during the first year of the project implementation, where funding is not performance-based, and for subsequent years where funding will be allocated according to performance in the previous year. After the first year of project implementation, all support received by the community groups will be performance-based. A combination of training, in-kind support, and cash payments will be made to each group, based on their requirements for completing the activities in the management plan. Part of the finance raised for the project through the sale of Plan Vivo certificates, and other means of support, will also be used to cover the costs incurred by the project coordinator and technical partners. Any finance raised in addition to that required to cover project implementation and management costs will be held in a fund managed by the BPWA, with the oversight of LP3M, to be used to support long-term forest protection and village development activities.

The final benefit sharing mechanism will be agreed by the project coordinator and community groups at the time when Plan Vivo agreements are signed. An indicative allocation of finance and support among the different activity groups and the project coordinator, based on the costs of project management and implementation detailed in the financial plan, is provided in Table 31.

Table 31 Approximate allocation of project implementation and management costs

	Proportion of total cost
Community Groups	
BPWA	5%
Forest patrol group	30%
Rattan group	4%
NTFP cultivation group	4%
Fish farming group	9%
Ecotourism group	4%
Water group	4%
Project coordinator	40%
TOTAL	**100%**

J.2.2 Performance-based support

After the first year of project implementation, all support received by community groups will be performance-based and will be dependent upon meeting threshold values for activity-based indicators (see Section K.1.1).

Indicator values will be reported on an annual basis through submission of an annual report to the Plan Vivo Foundation (see Annex 12). If all thresholds are met, a full issuance will be requested. If indicator values fall below the thresholds for one or more activity-based indicators, the participating communities will be required to implement the identified corrective actions.

If any activity-based forest protection indicator value falls below the threshold for two or more consecutive monitoring periods then a proportion of the certificate issuance will be withheld until it can be demonstrated that the indicator threshold has been met. The proportion withheld will be agreed between the project coordinator and the Plan Vivo Foundation, and should be proportional to the level of underperformance and the likely impact this will have on climate benefits.

If any activity-based livelihood activity indicator value falls below the threshold for two or more consecutive monitoring periods, then the project coordinator will withhold a proportion of the support to that group until it can be demonstrated that the indicator threshold has been met. The proportion withheld will be agreed between the project coordinator and the BPWA, and should be proportional to the level of underperformance.

K. Monitoring

K.1 Climate benefits

The project coordinator will work with participant communities to monitor the project activities that are expected to deliver climate benefits throughout the project period. At the end of each project period, a technical partner will be contracted to assess the benefits achieved by conducting an analysis of land cover change that occurred during the project period, and the results will be verified by an independent auditor. Drivers of deforestation and forest degradation will also be monitored by forest patrol teams, as described in Section K.4.1; and leakage will be verified according to the approaches in AA-CFREDD (Annex 6), as described in Section K.4.2.

K.1.1 Climate benefit monitoring plan

The project will employ two types of climate benefit monitoring: i) activity-based indicators that will be tracked throughout the project period to demonstrate that activities are being carried out as planned; and ii) land cover change assessment to verify climate benefits and update technical specifications at the end of each project period.

Activity-based indicators

The aim of activity-based indicators is to provide evidence that management plans are being carried out as described. Since these management plans are reviewed and determined to be appropriate to deliver the expected climate benefits; issuance of Plan Vivo certificates for the climate benefits described in Section F.1 will be requested if all activity-based indicator thresholds are met.

Indicators are described in Table 32 for each of the main activities in the management plan, including threshold values and corrective actions required if thresholds are not met.

Table 32 Activity-based indicators

Indicator	Threshold	Assessment method and means of verification	Corrective actions
Forest protection			
1) Securing rights	In the last 12 months, progress has been made towards securing rights to management and utilisation of the project area.	Description of progress made and challenges encountered and copies of regulations, permits and licenses issued included in annual report.	Project coordinator to review barriers to progress and develop a plan to overcome them with the forest management institution.
2) Forest management body functioning	In the last 12 months, members of the forest management body have met at least once a month, and reported to the project coordinator at least once every 3 months.	Meeting reports reviewed quarterly by project coordinator.	Review membership of management institution and resume programme of monthly meetings.
3) Village regulations	Regulations on the use of forest resources are in place and are sufficient to ensure sustainable forest management, prevent deforestation and forest degradation, and conserve biodiversity.	Copy of village regulations reviewed annually by project coordinator.	Revise village regulations.
4) Boundary marking	The boundary of the PACT is clearly marked, at least 4 information boards with details of village regulations on use of forest resources are in place, and fire breaks are open.	Description of activities included in annual report, and annual inspection conducted by the project coordinator.	Carry out required boundary marking activities.
5) Forest patrol and monitoring	Forest patrol teams have necessary equipment and capacity to complete effective patrol and monitoring activities, and have conducted two boundary patrols, and six routine patrols in each of the four patrol blocks, within the last 12 months.	Quarterly inventory of equipment, and review of patrol reports by project coordinator.	Project coordinator to provide necessary equipment, and training; Review membership of patrol groups and patrol schedule and update as required.
Livelihoods*			
6) Fish farming	In the last 12 months, progress has been made in the development of fish farming activities in and around Sigong Kelafang lake.	Quarterly progress review and annual inspection by project coordinator.	Review barriers to progress and update plans accordingly.

Indicator	Threshold	Assessment method and means of verification	Corrective actions
7) Water provision	In the last 12 months, progress has been made in the development and maintenance of water facilities from Garing River.	Quarterly progress review and annual inspection by project coordinator.	Review barriers to progress and update plans accordingly.
8) Rattan handicrafts	In the last 12 months, progress has been made in the development of activities and handicraft products.	Quarterly progress review and annual inspection by project coordinator.	Review barriers to progress and update plans accordingly.
9) NTFP cultivation	In the last 12 months, progress has been made in the development of NTFP cultivation activities around Sigong Kelafang lake.	Quarterly progress review and annual inspection by project coordinator.	Review barriers to progress and update plans accordingly.
10) Ecotourism	In the last 12 months, progress has been made in the development of Ecotourism facilities and activities.	Quarterly progress review and annual inspection by project coordinator.	Review barriers to progress and update plans accordingly.

* Not all livelihoods groups will be established at the start of the project period. Livelihood indicator thresholds will therefore only be required for groups that have been established for >12 months at the time of the annual report. Reasons for any delay in formation of other groups will be described in the annual report.

Verification of climate benefits

To verify climate benefits achieved during a project period and revise estimates of climate benefits expected in subsequent project periods, an assessment of land cover change in the project area and reference region during the project period will be carried out at the end of each project period, by a trained remote sensing and GIS technician. The leakage area approach will be used to verify leakage (see AA-CFREDD Section 3.3.2b; Annex 6).

The parameters that will be assessed are described in AA-CFREDD (Annex 6), and summarised in Table 33. The methods and datasets used will follow those used for the initial land cover change assessment (see Annex 7), and will be reported in a revised version of this PDD.

Table 33 Land cover change parameters assessed to verify climate benefits and update the PDD

Parameter	Approach	Frequency
Area of forest type *i*, legal classification *j* and topography class *k* in the reference region converted to non-forest during the project period ($AA_{Def_{i,j,k}}$)	Analysis of remote sensing (RS) data	Every 5 years
Area of forest type *i*, legal classification *j* and topography class *k* present within the reference region at the start of the project period ($AA_{RR_{i,j,k}}$)	Analysis of remote sensing (RS) data	Every 5 years
Area of forest type *i*, legal classification *j* and topography class *k* in the reference region converted to degraded forest during the project period ($AA_{Deg_{i,j,k}}$)	Analysis of remote sensing (RS) data	Every 5 years
Area of forest type *i*, legal classification *j* and topography class *k* within the project area that was deforested during the project period ($D_{PA_{i,j,k}}$)	Analysis of remote sensing (RS) data	Every 5 years
Area of forest type *i*, legal classification *j* and topography class *k* within the project area that was degraded during the project period ($G_{PA_{i,j,k}}$)	Analysis of remote sensing (RS) data	Every 5 years
Area of forest type *i*, legal classification *j* and topography class *k* within the leakage area that was deforested during the project period ($D_{LA_{i,j,k}}$)	Analysis of remote sensing (RS) data	Every 5 years
Area of forest type *i*, legal classification *j* and topography class *k* within the leakage area that was degraded during the project period ($G_{LA_{i,j,k}}$)	Analysis of remote sensing (RS) data	Every 5 years
Area of forest type *i*, legal classification *j* and topography class *k* present in the leakage area at the start of the project period ($A_{LA_{i,j,k}}$)	Analysis of remote sensing (RS) data	Every 5 years

K.1.2 Community involvement

Community members from the relevant activity groups will be responsible for collecting the information needed to assess activity-based indicator values, and reporting these to the project coordinator. The project coordinator will compile this information and inform the community groups if any corrective actions are required to ensure that thresholds are met for the reporting period. At the end of each annual reporting period, all monitoring results will be discussed in a community meeting, and the consequences for issuance of certificates and receipt of performance based support will be explained.

Forest patrol teams composed of community members will also be responsible for collecting and reporting information on biodiversity (see Section K.3.1), and drivers of deforestation and degradation (Section K.4.1). Participatory wellbeing assessment will also be used to verify the socio-economic benefits of the project (see Section K.2.1).

The results of the land cover change assessment completed at the end each project period will be used to revise Plan Vivo agreements for the subsequent project period. Maps

showing the location of any deforestation and degradation that occurred within the project area during the project period will be presented and discussed in a community meeting. The monitoring results, along with feedback from the activity groups, will be used to refine management plans, and update benefit sharing mechanisms and Plan Vivo agreements.

K.2 Socio-economic impacts

Socio-economic impacts of the project will be tracked with activity-based monitoring during the project period, and verified with participatory wellbeing assessment at the end of each project period.

K.2.1 Socio-economic monitoring plan

The activity-based indicators described in Section K.1.1 will be used to assess whether the project is on track to achieving the expected socio-economic benefits. Since the management plans are reviewed and determined to be appropriate to deliver the expected socio-economic benefits described in Section F.2.1, it can be assumed that if all activity-based indicator targets are met then the project is on track to delivering the expected socio-economic benefits.

In addition to the annual reporting of activity-based indicators, each year the project coordinator will conduct a participatory well-being assessment with a census of all households.

The indicators and levels that will be used to assess wellbeing were identified by members of the participant community and are described in Table 34. Initial values (High, Medium or Low) will be recorded for each indicator prior to the start of the project, and the same households will be revisited at the end of each year to determine whether the level for each indicator has improved, remained constant or declined. The results from this survey will be presented in a village meeting and discussed in focus groups to determine any linkages between the patterns observed and the project activities, and whether is evidence for improved wellbeing during the project period. The results from the survey, and focus group discussions, will be presented in the annual report submitted to the Plan Vivo Foundation, and used to revise the management plans if appropriate.

Table 34 Socio-economic indicators assessed at the end of each project period

Indicator	Level		
	High	Medium	Low
1) Education	Children educated outside North Kalimantan Province	Children educated within North Kalimantan Province	Children educated in Long Adiu Village
2) Dowry	Big amount of money for dowry and paid in cash	Medium amount of money for dowry	Amount of money for dowry is negotiable between two families, mostly for small amount or no without exchange of money
3) Hospitality	Regularly visited by guests at home; and serving proper food/beverage.	Sometimes visited by guests; serving simple beverage.	Rarely visited by guests.
4) House quality	Large house constructed using high quality timber for foundation (*ulin*), pole (*kapur*), floor (*ulin, ipil*), wall (*adaw*), inner-roof (plywood), and roof (*sirap,* multiroof, metal roof) and funding the house construction privately.	Medium house constructed using medium quality of timber and funding the house construction privately or partly using government-aid.	Small basic house constructed using fund and standard of government-aided basic houses.
5) Source of income	Two or more of the following sources of income: Continuous salary every month as government staff or teacher; having a grocery shop; rice and other crops harvest enough for a year; selling meat from hunting.	Rice and other crops harvest enough for more than a half year	Rice and other crops harvest enough only for a few months
6) Household appliances	Household has all of the following: TV, refrigerator, washing machine, generator	Household has one or more of the following: TV, refrigerator, washing machine, generator	No TV, refrigerator, washing machine, or generator
7) Means of transportation	A car and/or more than 1 motorbike	At least 1 motorbike	No motorbike
8) Sanitation	Good quality of bathroom and toilet	Medium quality of bathroom and toilet	No bathroom and/or no toilet

K.3 Biodiversity and ecosystem service impacts

Biodiversity and ecosystem service impacts are linked to the maintenance of forest cover and habitat quality by preventing deforestation and forest degradation. The approaches used to estimate and verify climate benefits therefore provide a good proxy for benefits to biodiversity and other ecosystem services. Additional monitoring of high conservation value species and threats to biodiversity will also be carried out by forest patrol teams.

K.3.1 Biodiversity and ecosystem service monitoring plan

The biodiversity and ecosystem service benefits of the project are expected to result from prevention of deforestation and forest degradation that would reduce the amount and quality of forest habitat available for the species identified in Section B.2.2, and disrupt a broad range of ecosystem services. The activity-based indicators described in Section K.1.1 will be used to determine whether the project is on track to achieving these benefits. Since the management plans are reviewed and determined to be appropriate to deliver the expected biodiversity and ecosystem service benefits described in Section F.3.1, it can be assumed that if all activity-based indicator targets are met, then the project is on track to delivering the biodiversity and ecosystem service benefits.

Furthermore, the verification of deforestation and degradation avoided during the project period as described in Section K.1.1 will serve to demonstrate the maintenance of forest habitats and ecosystems, as well as carbon stocks, and therefore provides a means to verify benefits to biodiversity and ecosystem services as well as greenhouse gas emission reductions.

In addition to annual reporting of activity-based indicators, and the verification of deforestation and forest degradation prevented at the end of each project period, forest patrol teams will also record signs and sightings of high conservation value species, and threats to biodiversity they encounter during their patrols. The indicators that will be recorded will be finalised during the training of forest patrol and monitoring teams, but are likely to include some or all of the indicators in Table 35. Patrol teams will also record the track followed during patrols using GPS, and the time spent patrolling, and distance covered. All encounters will be recorded in patrol team reports which will be assessed every 3 months by the project coordinator. The results of biodiversity and threat monitoring by forest patrol teams will be used to inform the revision of project activities if appropriate, and will be summarised in annual reports to the Plan Vivo Foundation (see Annex 12).

Table 35 Biodiversity indicators assessed by forest patrol teams

Indicator	Details recorded	Approach	Frequency
Encounters with priority species*	Location of observation, distance from observer, type of observation (seen/heard), sex and reproductive status (if known), confidence in identification	Recorded by patrol teams	Reported to project coordinator every 3 months
Signs of priority species*	Location, type of sign (spoor/scat/other), confidence in identification	Recorded by patrol teams	Reported to project coordinator every 3 months
Unsanctioned animal traps located and removed	Location, type of trap	Recorded by patrol teams	Reported to project coordinator every 3 months
Other threats to biodiversity	Location, type (e.g. signs of unsanctioned hunting such as gunshots heard)	Recorded by patrol teams	Reported to project coordinator every 3 months

* Priority species will be determined prior to the initiation of forest patrol and monitoring activities, and will include keystone species (expected to be indicators for a broader range of species), species significant to international conservation efforts, and species of local interest.

K.4 Other monitoring

In addition to the monitoring of climate, socio-economic, biodiversity and ecosystem service benefits described in Section K.1, K.2 and K.3, the project will also carry out monitoring of drivers of deforestation and forest degradation throughout the project period, to enable the project coordinator and participating community to respond to any threats identified.

K.4.1 Drivers of deforestation and degradation

Evidence of drivers of deforestation and forest degradation active within the project area will be recorded during forest patrol activities, and reported to the project coordinator by the forest patrol teams. Evidence collected will include photographs, location data, and area estimates if appropriate. This evidence will be reviewed every three months, and project activities will be revised if necessary. The indicators that will be tracked will be finalised during the training of forest patrol and monitoring teams, but are likely to include some or all of the indicators in Table 36.

Table 36 Deforestation and forest degradation indicators assessed by forest patrol teams

Indicator	Details recorded	Approach	Frequency
Unsanctioned opening of fields	Location, area of forest cleared (measured or estimated), reason for clearance (e.g. agriculture/road building), responsible party (if known)	Recorded by forest patrol teams	Reported to project coordinator every 3 months
Unsanctioned trees felled	Location, approximate date felled (if known), species (if possible), reason for felling (e.g. timber), responsible party (if known)	Recorded by forest patrol teams	Reported to project coordinator every 3 months
Area affected by forest fire	Location, area affected (measured or estimated), cause of fire (natural or human), reason for fire (if known), severity of damage, responsible party (if applicable and known)	Recorded by forest patrol teams	Reported to project coordinator every 3 months

Annexes

The following annexes are provided as separate files.

Annex 1 – Management plan

Annex 2 – Evidence of community participation

Annex 3 – Plan Vivo agreement template

Annex 4 – Training curricula

Annex 5 – GIS data

Annex 6 – Approved approach

Annex 7 – Land cover change assessment

Annex 8 – Technical specification calculations

Annex 9 – Key people

Annex 10 – Permits and legal documentation

Annex 11 –Database template

Annex 12 – Annual report template