

Bahau-Kahei FMU (T/3236)

Forest Management Plan (FMP)

Background Information

- Bahau-Kahei Forest Management Unit (Bahau-Kahei FMU) is of Hill Mixed Dipterocarp Forest that covers an area of about 45,035 hectares in the Upper Kapit Division, which is next to North Kalimantan, Indonesia (Figure 1).
- It is located between latitudes 1° 49' 00" N – 2° 04' 00" N; longitudes 114° 32' 00" E – 114° 53' 00" E.
- The altitude ranged from 400 m.a.s.l. – 1,460 m.a.s.l.
- The access route for the FMU (land and river transportation network) is as shown in Figure 2.

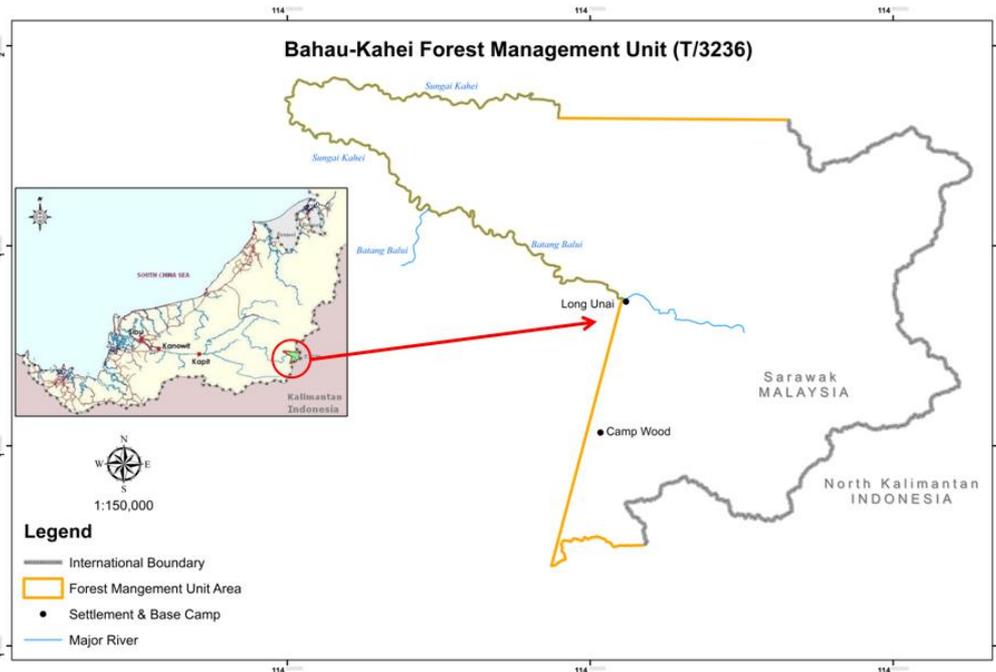


Figure 1. The locality map of Bahau-Kahei Forest Management Unit (T/3236).

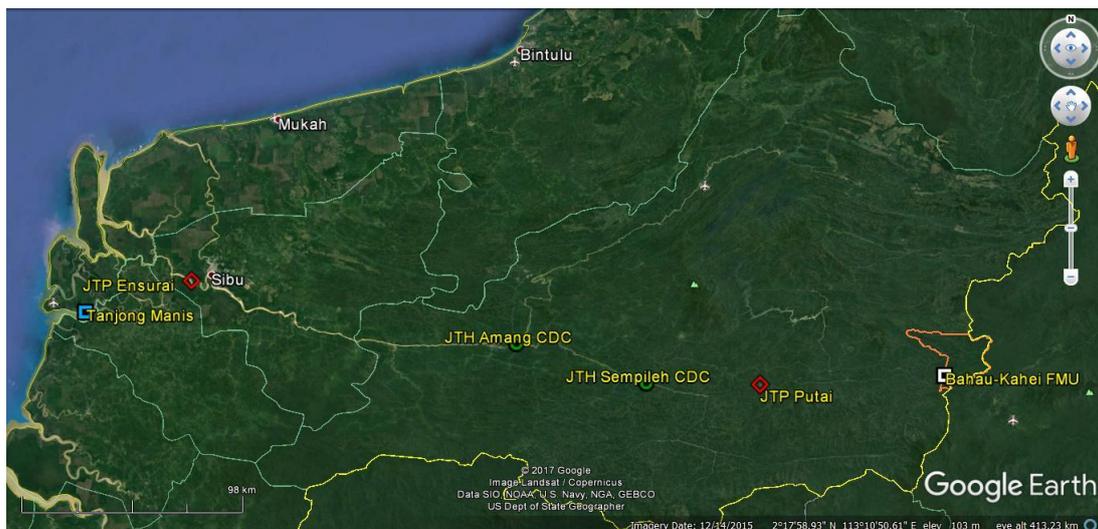


Figure 2. The log transportation network showing the locations for i) Bahau-Kahei FMU (the source of legal timber); ii) JTP Putai (the veneer mill); iii) JTH Sempileh and JTH Amang (the collection and distribution centers); iv) JTP Ensurai (the plywood mill); and v) Tanjong Manis (the export point).

- The FMU is also part of the *Heart of Borneo (HoB) Initiative*, where good forest management is being practiced to achieve sustainable development through economics, social and environmental wellbeing that could also serve for forest biodiversity conservation.

Legal Status

- The Forest Timber License No. T/3236 has been issued to Ankura Trading (M) Sdn. Bhd. (the FMU Holder) on October 15, 1990 and will expire on October 14, 2026.
- Jaya Tiasa Holdings Berhad is currently acts as its FMU Manager.

The Essence

- The second revision of the FMP for Bahau-Kahei FMU was approved by the Forest Department Sarawak on April 17, 2017, with a 25-year cutting cycle as stipulated in the current State policy on forestry matters.
- The FMP aims to ensure that the management prescriptions for the 29,753 ha of logged-over production area are complying with good forest management practices.
- The mid-term review for the FMP is at every 12 years. However, it may be reviewed at a 5-year interval to include the latest results of High Conservation Value Area (HCVA) monitoring, including research techniques and output that deem appropriate.

Key Management Policies

- Three policies and one declaration have been adopted by the FMU, namely:
 - *Policy Statement on Sustainable Forest Management;*
 - *Health, Safety and Environment Policy Statement;*
 - *Good Social Practices Policy;* and
 - *Declaration of Non-use of Pesticides.*

Forest Resource Assessment

- The FMU constitutes about 85% of Permanent Forest Estate (*i.e.* Bahau Protected Forest (34%) and Linau Protected Forest (66%)) and 15% of State land.
- The major forest type is of Hill Mixed Dipterocarp Forest (HMDF).
- The FMU is able to produce harvestable timber volume at a rate of 1.07 m³/ha/year. The projected yield versus projected harvest over the 25-year cutting cycle is able to produce a surplus volume of 200,833 m³ from the 29,753 ha of logged-over production area. Such outcome, however, needs to be further substantiated as more PSP assessment results are available.
- The Annual Allowable Cut (AAC) is at 29,753 m³/year over the harvesting period of 20 years; of which the remaining 5 years is the fallow period.
- Based on the operational Pre-harvesting inventory, the timber volume ranges from 15 – 20 m³/ha is able to be extracted. The quantity, however, may vary; depending on timber stocking.

Management Prescriptions and System

- The FMU adopts the multi-purpose, Sustainable Forest Management (SFM), which are socially compatible, ecologically and environmentally sound, and economically viable.
- More emphasis is given on Sustainable Forest Management-Reduced Impact Logging (SFM-RIL)-related manpower and compliance assessment to attain recognition for Forest Management Certification (FMC) and also sustainability of forest resource.
- To accommodate the 25-year cutting cycle, a 20-year harvesting period has been planned. The environment shall be safeguarded through the maintenance of an extensive road network that currently serves the existing 20 coupes. Provision for the remaining 5-year fallowing period will enable the logged-over forest to regenerate naturally.
- Application of RIL is based on selective, tractor-based harvesting system; with possibilities to explore other similar harvesting system.
- The Pre-harvesting inventory employs the approved cutting limits for harvestable trees at ≥ 45.0 cm diameter at breast height (dbh) for Non-Dipterocarps and ≥ 50.0 cm dbh for Dipterocarps. Potential crop trees (PCT) at 30.0 cm dbh and below the approved cutting limits are also being enumerated, together with seed, fruit and protected tree species. Pre-harvesting also employs climber cutting as a silvicultural treatment to liberate PCT and enable it to grow into desirable timber trees for the next harvest.
- Post-harvesting Diagnostic Sampling plots have also been established to monitor logging damage and growth of residual timber stand.

- Peninsular Malaysia's *Selective Management System (SMS)*¹ that maintains a minimum PCT stocking at 32 trees/ha has been adopted. Therefore, whenever the residual PCT stocking is adequate, enrichment planting is not required.

Environmental Considerations

- The Environmental Impact Assessment (EIA) Report entitled '*Hill Logging under Forest Timber Licence No. T/3236 at Batang Balui – Sg. Kahei – Sg. Aput, Kapit Division, Sarawak*' was approved by the Natural Resources and Environment Board (NREB) Sarawak on October 3, 2013.
- The FMU shall adhere to the mitigation measures as prescribed in the *General and Specific Terms and Conditions* of the approved EIA Study Report.

High Conservation Value Areas (HCVA)

- The WWF-Malaysia's 2009 '*High Conservation Value Forest (HCVF) Toolkit for Malaysia*' is the main reference for HCVA identification in the FMU.
- Based on its six values and subsequent attributes, there are eight *High Conservation Value Areas (HCVA)* been established within the FMU, such as water catchment, Terrain IV, burial sites, a saltlick and the international buffer zone.
- Baseline wildlife studies have also been initiated to identify the *Endangered, Rare and Threatened (ERT)* plants and animals.
- The 2018's '*High Conservation Value Forest (HCV 1 – HCV 6) at Timber License No. T/3236*' has also been produced (**Table 1**) to conform all of the above.

Table 1. Summary of HCVF findings at Bahau-Kahei FMU.

| Category | HCV | Data Source/Attributes | Findings |
|---------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----------------------------------------------------------------------------------------------------------------------------|------------------|
| HCV 1 : Biodiversity Values on forest area with globally, regionally or nationally significant biodiversity values, further defined as below: | 1.1 | Determined if any Totally Protected Areas is within or adjacent the FMU | Not Present |
| | 1.2 | Protected, Endangered and Threatened species according to Wild Life Protection Ordinance, IUCN and Appendix II of CITES | Present |
| | 1.3 | Endemic species | Present |
| | 1.4 | Critical temporal areas important for wildlife | Present |
| HCV 2 : Landscape-level forest | 2 | Forest areas important for wildlife species to exist in natural patterns of distribution | Present |
| HCV 3 : Threatened or Endangered Ecosystems | 3 | Threatened or Endangered Ecosystems prioritized for conservation management as defined under National Conservation Strategy | Possibly Present |
| HCV 4 : Forest area that provides basic services of nature in critical situations | 4.1 | Watershed protection on forest area legally gazetted as Protection Forest for water catchment | Present |
| | 4.2 | Erosion Control on forest areas that have been legally gazetted for soil protection or conservation | Present |
| | 4.3 | Presence of forest attributes that can prevent, control and cause forest fire | Present |
| HCV 5 : Basic need of local communities | 5 | Forest area is fundamental to meeting basic needs of local communities. | Present |
| HCV 6 : Cultural Identity of Local Communities | 6 | Forest area is critical to local communities' traditional cultural identity | Present |

¹ Kamaruzaman, M.P. and W.M.S. Wan Ahmad. 2003. Forest Harvesting Practices towards achieving Sustainable Forest Management in Peninsular Malaysia. Paper submitted during *International Expert Meeting on The development and Implementation of National Codes of Practice for Forest Harvesting – Issues and Options*. 17 November – 20 November 2003. 10 p. ([http://www.rinya.maff.go.jp/code-h2003/PART_4/Mohd_Paiz_\(Malaysia\).pdf](http://www.rinya.maff.go.jp/code-h2003/PART_4/Mohd_Paiz_(Malaysia).pdf))

Kubota V.R., Yoneda T., Ugawa S., Okuda T. and Wan-Rasidah, K. 2018. Effects of selective management system on biomass structure and forest sustainability: A case study of a tropical rainforest in Peninsular Malaysia. *Journal of Tropical Forest Science* 30 (2): 259 – 268. DOI: 10.26525/jtfs2018.30.2.259268 (https://www.researchgate.net/publication/324757753_Effects_of_selective_management_system_on_biomass_structure_and_forest_sustainability_A_case_study_of_a_tropical_rainforest_in_Peninsular_Malaysia)

Pakhriazad, H-Z., Takeo S., Yuei N. and Kiyoshi Y. 2004. A Selective Management System (SMS): A case study in the implementation of SMS in managing the Dipterocarp forests of Peninsular Malaysia. *九州森林研究* No. 57: 39 – 44 (<http://ffpsc.agr.kyushu-u.ac.jp/kfs/kfr/57/bin090525182214009.pdf>)

Universiti Putra Malaysia, (1987) *Implications of the selective management system on the management of the hill forests of Peninsular Malaysia*. In: Workshop on Impact of Man's Activities on Tropical Upland Forest Ecosystems, 3 – 6 February 1986, UPM Serdang, Selangor. (pp. 69 – 80). (<http://psasir.upm.edu.my/id/eprint/17797/>)

Community Wellbeing

- The Envisar-Forest Department Sarawak's 2010 '*A Socio-economic Study of the Communities found within and around the Forest Management Units (FMUs) undergoing Certification in the Kapit Division of Sarawak*' is the main social baseline reference.
- The local community – comprises of ethnic Penan and Kenyah – is settled harmoniously at Long Unai (inside the FMU area) since 1984.
- Subsistence farming and the collection of Non-Timber Forest Products (NTFP) are the main traditional economic activity at Long Unai.
- Nowadays, some of them are being employed at the nearby timber camps and major towns. In this regards, the FMU is committed to prioritize job opportunities for them; and together with RIL practices, shall improve their economic and environmental wellbeing.
- Local community is one of the important stakeholders in the FMU area. Therefore, a Community Representative Committee (CRC) has been established; to foster good relationship between the FMU and the community.
- Mutual understanding and benefits between both parties also play an important role, as long as forest operations within the FMU area is concerned, particularly related to SFM and FMC.
- The 2018's '*A Social Impact Assessment (SIA) Report of Forest Operations in Bahau-Kahei Forest Management Unit (FMU), Kapit Division, Sarawak*' has also been produced to conform all of the above.

Monitoring

- Frequent monitoring is vital to evaluate the population dynamics of both flora and fauna (human aspects included), including the condition of the environment due to timber harvesting activities.
- Among the required monitoring to be implemented:
 - PSP: to evaluate current forest condition and tree growth rate; including the observed changes in the tree population;
 - Post-harvesting Diagnostic Sampling: to evaluate current forest condition and tree growth rate; including the observed changes in the tree population;
 - High Conservation Value Area (HCV 1 – HCV 6): to monitor any changes within the FMU, including the population dynamics of flora, fauna and local community, as a result of any changes in the State Government's policy pertaining to Protection Area; and also due to effects of timber harvesting activities;
 - Social Impact Assessment: to monitor the wellbeing and livelihood of local community (FMU forest workers included), as a result of timber harvesting activities that is taking place in the FMU;
 - Environmental Compliance Assessment: to monitor and safeguard the environment (especially on harvesting practice, river water quality, *etc.*), as a result of timber harvesting activities that is taking place in the FMU; and
 - Health, Safety and the Environment: to monitor the wellbeing of FMU forest workers at their respective work place and settlement.

Research Collaboration

- The FMU is intended to collaborate with research institutions on PSP, Post-harvesting inventory and wildlife population dynamics in the future, to keep on updates on its monitoring results.

Initiatives

- The FMU has undertaken Stage I, Stage II and Verification Audits on July 26 – 28, 2017, January 15 – 18, 2018 and August 7 – 10, 2018, respectively; against the *Malaysian Criteria and Indicators (Natural Forest)* certification program conducted by SIRIM QAS International Sdn. Bhd.