

EXECUTIVE SUMMARY

A. MANAGEMENT HISTORY

In September 1997, Bornion Timber Sdn Bhd (BTSB) and the State Government of Sabah signed the Sustainable Forest Management License Agreement 03/97 (SFMLA 03/97). The licenced area initially comprised an area of approximately 108,993 ha, consisting of the Ulu Sg. Milian Forest Reserve (Block A) and part of the Sapulut Forest Reserve (Block B). The area is also referred to as Forest Management Unit No. 11, according to administrative regulations of the Sabah Forestry Department.

During the period of the first 10-year Forest Management Plan (2002 – 2011) the whole Licenced Area had been managed by BTSB. In the 2nd Forest Management Plan (2012 – 2021) the Licenced Area was reduced to a total gross area of approximately 98,985 ha, due to the excision of 10,008 ha by the State Government for the purpose of development by a different management entity.

B. SCOPE OF FOREST MANAGEMENT PLAN

FMU No. 11 has been split into two separate Sub-Management Units, for the purpose of forest certification assessment and management as separate entities under Natural Forest and Forest Plantation regime respectively. The *Forest Plantation Management Unit* covers a gross area of 57,105.9 ha or about 59% of the FMU area, whereas the *Natural Forest Management Unit* comprises a gross area of 41,878.7 ha or about 41%.

A summary of the subdivision of the FMU is given in the Table below.

Management Type / Function	Gross Area (ha)	Sub-Unit (%)	FMU area (%)	MC&I Certified Area	Certified Area (%)
Forest Plantation Sub-Management Unit					
Production	53,255.65	93.26			
Conservation	1,973.65	3.46			
Community Forestry	1,876.60	3.29			
Total Sub-Unit:	57,105.9	100.00	59.01	25,536.71	43.64
Natural Forest Sub-Management Unit					
Production	29,574.2	70.62			
Conservation	12,304.5	29.38			
Total Sub-Unit:	41,878.7	100.00	40.99		
Total FMU:	98,984.6		100.00		

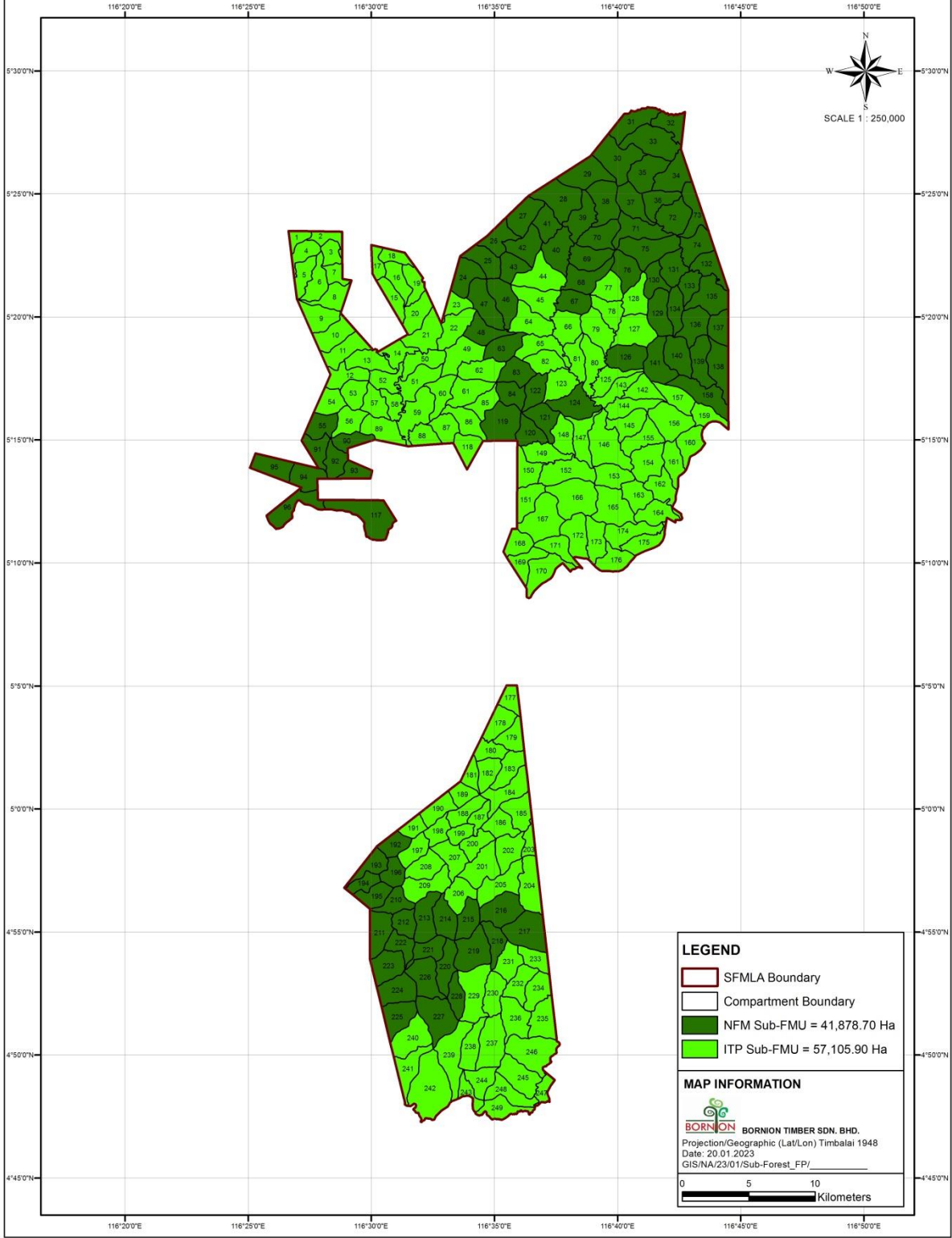
Due to the design of the FMU boundaries both natural and plantation forest areas are further subdivided into

- PART A in the Northern part of the Licenced Area, within Milian Forest Reserve, and PART B in the Southern part of the Licenced Area, within parts of Sapulut Forest Reserve

This Plantation Development Plan (PDP) only covers the Forest Plantation or Industrial Tree Plantation (ITP) area, whereas the Natural Forest Management area is regulated by a separate plan.

The Figure below illustrates the location of the both Forest Sub Management Units with their area proportions in Part A and Part B respectively.


SUB -FOREST MANAGEMENT UNITS OF FMU 11 MAP - FP



LEGEND

- SFMLA Boundary
- Compartment Boundary
- NFM Sub-FMU = 41,878.70 Ha
- ITP Sub-FMU = 57,105.90 Ha

MAP INFORMATION

 **BORNION** BORNION TIMBER SDN. BHD.
 Projection/Geographic (Lat/Lon) Timbalai 1948
 Date: 20.01.2023
 GIS/NA/23/01/Sub-Forest_FP/_____

0 5 10
 Kilometers

C. COMPANY MISSION, POLICIES AND OBJECTIVES

Mission

Bornion Timber Sdn Bhd will ensure that the integrity, health, viability, and productivity of its forest plantation area within FMU No. 11 is properly developed, maintained and enhanced without jeopardizing the biological and social environment.

Management Policies and Objectives

In order to achieve the full range of multiple benefits that forests can provide, BTSB is bound by the following policies and commitments:

- BTSB strives to develop and maintain a well-managed forest plantation resource including timber and non-timber forest products for continuous supply of local and global wood markets.
- Environmental safeguards shall be integrated into our normal operations so that biological diversity is assured throughout the Licenced Area. Therefore, BTSB will apply forest management practices based on the principles of sustainable forest management.
- The local communities are important stakeholders. Therefore, BTSB is committed towards the social requirements of managing the Licenced Area, with care, safety, health, compassion and consideration of community needs forming part of the day to day operations.
- BTSB will provide means of human resource development through training and enhancing technical skills for its staff and the young generation, by way of attachment to our operations. BTSB also opens its door to institutions of higher learning, enabling their students to participate in practical training or engage in research and development tasks linked to responsible forest management.

BTSB's overall forest management objective is to enhance and ensure the perpetuity of the natural resources of the Licenced Area, which is to be managed on a sustainable basis by seeking a balance between a variety of values, products, and services, in an environmentally appropriate and socially acceptable manner.

The resulting specific management objectives are briefly summarized in the following points:

- Protect Biodiversity
- Undertake Natural Forest Conservation and Restoration
- Maintain and Enhance Economic Viability
- Contribute to Socioeconomic Development
- develop Recreation Opportunities
- promote Research and Development
- Maintain Forest Management Certification

D. CERTIFICATION COMMITMENT

In line with the forest certification policy of the Sabah Forestry Department (SFD) the company is committed to maintain its certified status under the Malaysian Timber Certification Scheme (MTCS) which has been endorsed by the Programme for the Endorsement of Forest Certification (PEFC International, Switzerland), the world's largest forest certification organisation. BTSB has adopted MTCS for both natural forests

and plantations which is currently referred to as the Malaysian Criteria and Indicators for Sustainable Forest Management (MC&I SFM) which includes both Natural Forests and Forest Plantations as the applicable certification standards.

E. CURRENT SITUATION

1. Area description

The mean annual rainfall in the area amounts to 2,342.9 mm, with an average mean of 203.6 mm/month and a broad range of variation from 27.9 to 557.8 mm/month.

The atmospheric temperature ranges from 28°C to 35°C with temperatures at night rarely falling below 18°C. The range between the warmest and coolest month is less than 5°C.

The mean monthly relative humidity ranges from 70% to 90%, depending on location and month.

The dominant soil formations are the Crocker and Maliau Associations, which cover about 83.9% of the Licenced Area. Soil types include Orthic Acrisols of Tanjong Lipat and Kapilit families and Chromic Cambisols of the Luasong family. Their texture varies from sandy clay loam to clay loam and they have a very low reserve of plant nutrients.

The topography ranges from gentle to considerably rugged terrain that is categorized into two classes of slope: 0° to 25° and greater than 25°. Large portions of the southwestern parts of Ulu Sg. Milian FR (BLOCK A) and the western parts of Sapulut FR (BLOCK B) are hilly, with elevations of more than 1,000 m above sea level. The slope classification indicates that approximately 60 % of the total area are undulating hills having slopes ranging from 0° to 25°.

The Licenced Area (BLOCK A) forms part of the watershed of the Milian River, which is the tributary of the Kinabatangan River, draining to the east coast. Most of the tributaries of Milian River have their headwaters in the Licenced Area, which flow down from the western portion of the FMU. Sg. Pingas and Sg. Labau flow from Trus Madi FR through Ulu Sg. Milian FR and join Sg. Pinangah and Sg. Melikop. All these rivers drain into the Milian River to form part of the upper Kinabatangan River drainage system.

Prior to year 1997 the Licenced Area was classified into six different forest types, however, three of these forest types are of minor occurrence. These include Limestone Forest, Kerangas or Heath Forest, and Lowland Dipterocarp mixed with Heath Forest. The three dominant forest types were Upland Mixed Dipterocarp Forests (UMDF); Upland Mixed Dipterocarp Forest mixed with Kerangas Forest (UMDF & KF) and Lowland Mixed Dipterocarp Forest (LMDF).

2. Wildlife surveys

Three expert surveys on wildlife populations in the Licenced Area had been carried out in years 1998, 2011, and 2014. Since year 2015, BTRB has established its own Wildlife Unit to monitor wildlife populations in the FMU.

According to the survey of year 2014 twenty-six species of mammals were recorded which are all protected species under the Wildlife Conservation Enactment 1997. The presence of

some umbrella species is encouraging which provide an indication of the area being able to support such wildlife populations. Presence of endangered species confirmed that the areas designated as Conservation Areas have significant biodiversity values.

Presence of the Asian elephant (*Elephas maximus*) was recorded based on foot prints and dung piles seen in the Sapulut Forest Reserve and was also recorded during the survey conducted by Sabah Wildlife Department in April 1998. The occurrence other endangered species such as the Malayan Sun Bear (*Helarctos malayanus*) was confirmed through camera trapping.

Six species of primates were noted to be present in the area during the survey including the Orang-utan (*Pongo pygmaeus*), Bornean gibbon (*Hylobates muelleri*), Pig-tailed Macaque (*Macaca nemestrina*), Long-tailed Macaque (*Macaca fascicularis*), Red Leaf Monkey or Maroon Langur (*Presbytis rubicunda*) and Hose's Langur (*Presbytis hosei*) were recorded during the survey.

Evidence on the presence of the highly endangered orang-utan within the surveyed area during this survey conforms with earlier findings by Ancrenaz, M et al. (2004) that the area is generally low in term of Orang-utan density in Sabah.

Vocalizations of Bornean gibbon could be heard in all the surveyed areas indicating that the species is still common within the Licenced Area.

Images of the Pig-tailed Macaque (*Macaca nemestrina*) were captured on camera traps, indicating their common presence in the Licenced Area. The Long-tailed Macaque is believed to be common in the Licenced Area.

The presence of ungulates was recorded through their footprints and also through their captured images on camera traps. They are recorded throughout all the surveyed areas and appeared to be still common although there are sign of hunting activities targeting any of these species. The species include Sambar Deer (*Cervus unicolor*), Bornean Yellow Muntjac (*Muntiacus atherodes*), Common Barking Deer (*Muntiacus muntjac*), Lesser Mouse-deer (*Tragulus javanicus*), Greater Mouse-deer (*Tragulus napu*) and Bearded Pig (*Sus barbatus*).

Other species recorded during the survey and also by the Patrol and Enforcement Unit include the Yellow-throated Marten (*Martes flagivula*), Common Porcupine (*Hystrix brachyura*), Thick-spined Porcupine (*Thecurus crassipinis*), Malay Civet (*Viverra zangalunga*), Pangolin (*Manis javanicus*), Leopard Cat (*Felis bengalensis*) and Giant Squirrel (*Ratufa affinis*).

One important finding in the Licenced Area is the presence of Tufted Ground Squirrel (*Rheithrosciurus macrotis*), a bornean endemic, captured on camera trap set up by Patrol and Enforcement Unit of BTTB in compartments 83 and 119.

A total of 141 bird species were recorded in the survey area of which twenty eight species (28) are listed as protected species under the Wildlife Conservation Enactment 1997. With the exception of species such as the hornbills and Great Argus (*Argusianus argus*), most of species are typical of disturbed habitats.

All eight species of hornbills recorded during the survey were the Oriental pied hornbill (*Anthraceros coronatus*), white crowned hornbill (*aceros comatus*), wrinkled hornbill (*aceros corrugatus*), helmeted hornbill (*Rhinoplax vigil*), Rhinoceros hornbill (*Buceros rhinoceros*), Wreathed hornbill (*Rhyticeros undulatus*), Bushy-crested hornbill (*Anorrhinus galeritus*), and Black hornbill (*Anthraceros malayanus*). The Helmeted hornbill (*Rhinoplax*

vigil) and the Rhinoceros hornbill (*Buceros rhinoceros*) are classified as Near Threatened on the IUCN Red List.

One notable species is the presence of a pair White-fronted Falconet (*Microhierax latifrons*), a Bornean endemic species listed as Near Threatened on the IUCN Red List.

Other important species that were recorded during the survey include Storm's Stork (*Ciconia stormi*) and Oriental Darter (*Anhinga melanogaster*).

Most of the other recorded species can be found in abundance in the surveyed area and also in other disturbed forest habitats almost throughout Sabah.

Twenty four reptile species were encountered during the survey. Such secretive wildlife species are difficult to detect, given the limited period undertaken to survey the area in which efforts focused on surveying mammals and birds.

The survey also recorded the presence of 18 species of amphibians in the surveyed areas.

With the exception of long-tailed macaques (*Macaca fascicularis*) and pig-tailed macaques (*Macaca nemestrina*) most mammal species occur at very low density.

All bird species recorded during the survey except for larger birds such as the hornbills were found to be fairly common throughout the surveyed areas.

Hunting pressure (poaching) from the surrounding villages and outsiders is another potential threat which has also been the main constraint of protecting the wildlife in the Licensed Area. However, this situation has been mitigated to a certain extent by erecting new forest gates that are used to monitor and control the access into the FMU.

Since the end of year 2015, Bornion Timber Sdn. Bhd. has established its own Wildlife Unit with the objective to develop a long-term wildlife monitoring system.

3. High Conservation Values

Besides their economic value, forests also include environmental and social values, such as watershed and soil protection, habitats for wildlife, as well as areas important to the livelihood of local communities. Where such values are considered to be of outstanding significance or of critical importance these are defined as High Conservation Value Forests (HCVF). The company has undertaken an assessment of High Conservation Values present in the Licenced Area, based on the WWF-Toolkit for Malaysia. The assessment revealed that the following HCV categories are present in the FMU:

HCV 1 (Species diversity), HCV 2 (Landscape-level Ecosystem and Mosaics), HCV 3 (Ecosystem and Habitats), HCV 4 (Ecosystem Services), HCV 5 (Community Needs), and HCV 6 (Cultural Values).

4. Environmental Impact Assessment (EIA)

A Special Environmental Impact Assessment (SEIA) was undertaken for all the activities to be conducted in the Licenced Area. The SEIA study started in June 2002 and following two sessions of public hearing and submissions it was approved on 6th June 2003.

An agreement or "Surat Akujanji" was signed between BTSB and EPD on 9th June, 2003 to adhere to the environmental management standards and mitigation measures

recommended in the SEIA report. A supplementary amendment was issued in 2016 to include additional mitigation measures.

In the agreement, various mitigation measures were recommended to manage the impact of the forestry activities to be undertaken. The implementation of agreed mitigation measures is monitored by EPD through an Environmental Monitoring Programme, with 3 Environmental Compliance Reports produced every year. The ECR amongst others include the following aspects:

- soil erosion & sedimentation
- water quality
- harvesting activities
- planting activities
- scheduled waste management
- solid waste disposal
- forest fire prevention and control
- protection of sensitive areas (conservation zones and steep areas)
- safety and health
- Rubber Plantation Establishment

Following the identification of any non-compliance BTRB will undertake corrective action to achieve full compliance with the environmental management prescriptions of both the Department of Environment (DOE) and Environment Protection Department (EPD).

Details of the forest monitoring results are provided in the *Public Summary of Forest Monitoring* as published on the company website.

5. Socio-economic situation

A new Social Impact Assessment has been completed in 2022. Based on the assessment, collected data could be grouped into four different social impacts: 1) land, 2) environment, and 3) socioeconomic / sociocultural. For the purpose of further analysis using the RIAM (Rapid Impact Assessment Matrix) analysis method, these three impacts were further refined into eight (8) sub-categories, 1) Land Disputes, 2) Changes in Livelihood, 3) Food Security, 4) Local Culture, 5) Infrastructure development, 6) Water quality, 7) Labour Requirement, 8) Local economy.

There are 29 villages found within 2 km distance from the boundary of the Licenced Area. Only a single village (Kg. Wawasan, Cpt 59 of Ulu Sg Millian FR) is located within FMU 11.

It is estimated that there are about 9,748 people from 1,965 households living in 1,269 houses in the 21 villages and 8 sub-villages located within and adjacent to Licenced Area. The average number of persons per household is 4.96, which is about the average for Sabah (5.0).

The Dusun form the main local communities residing at the vicinity and within Ulu Sg. Millian FR while the Murut communities dominate the population adjacent to Sapulut FR. The dominant religion in both areas is Christian. Generally, the local communities can be grouped into 5 groups based on their location and ethnicity (see Table 3.6). These are Dusun Lobou, Mixed Dusun, Lundayeh and Murut, Mixed Murut and Sungai, and Murut.

In general, all villages and sub-villages are well connected with the main road. However, the road conditions from the highway to their respective villages vary from graveled to earth road.

The houses of the villagers vary in shapes and sizes. The building materials used are either from wood, a combination of wood and concrete or fully concrete depending on the household's financial strength. Wooden houses, however, are common in all villages. Water supply is not a major problem since almost all villages have installed piped-gravity water, except for Kg. Wawasan which depends on rainwater and river water.

Electricity supplied by SESB has reached 93% of the 29 villages. The rest have to rely either on generator sets or kerosene pump-lamps.

Many public utilities have been established or provided by the government, particularly in the older villages. These utilities include 18 community halls and 17 football fields, a rest-house (in Kg. Masaum only) and Public Telephone Booths. In addition, mobile telecommunication companies have erected their towers in strategic places

Regarding health care facilities only Kg. Pandiwan has a Village Clinic (Klinik Desa). It also services other nearby villages. The rest of the communities would have to travel to the Health Centres located in Sook, Tulid, Nabawan and Sapulut. All serious and emergency cases will be referred to the District General Hospital in Keningau and Telupid or Duchess of Kent Hospital Sandakan (in the case of villagers in Kg. Masaum).

Kindergartens and or primary schools are available in some established villages with higher population density. Churches or chapels are available in 21 villages, while mosques are available in 7 villages.

Subsistence farming still remains the main economic activity of all the communities within and adjacent to the Licenced Area. Based on the SBS survey, the percentage of respondents who are farmers ranges between 60% and 80%.

The household monthly cash incomes earned by the families of the respondents varies widely among the community and by area, locality, and village. About 80% of the households earn less than RM 700 per month. The percentage of households earning higher income ranges between 10% and 20% by area and village.

Agriculture is the primary means of life in all villages surveyed. The main source of income is from rubber for those who have developed small land lots inside the Licenced Area, and from small-scale oil palm plantations around the FMU. The income derived from these crops contributes 85% of the total household cash income. This is followed by remittances from family members working outside the community (10%). Operating small sundry shops, private transportation business, or odd jobs contribute small household cash income (5%).

A number of training programs are run by various agencies to enhance the capacity and capability of local communities. Some of the villages surveyed participate in improving the technical skills of the people, particularly school leavers. The institutions and agencies implementing formal training courses and programmes include the Department of Agriculture, Fishery Department and Lembaga Industri Getah Sabah. Besides this, the Department of Agriculture runs intensive and extensive programmes involving rural communities, called Rural Extension Services.

About 20% of the respondents own titled land, whilst 80% stated that they do not own any land or they are in the process of application for Native Titles. About 75% of the respondents

claimed to have NCR, also inside the Licenced Area. These communities claim that they have been cultivating the lands before the Ulu Sg. Milian FR was gazetted as a Commercial FR.

The local communities living within and adjacent to the Licenced Area use their land(s) or farmland plots exclusively for agriculture farming. The most common cash crops planted are rubber and oil palm, while padi is planted mainly for subsistence. Other crops that have been planted include various fruit tree species. Based on field observations, there is no land that remains idle.

The population is fast growing and as a consequence, new generations would have to cope with smaller pieces of inherited land or none at all. Furthermore, most of their so called 'land' now belongs to other people, or to commercial oil palm companies. So, many have to search for new land and opened up sub-villages. Others claim land inside the Licenced Area especially in BLOCK A as their NCR land, which subsequently caused conflicts and frictions between the concerned communities, BTSB, and the Sabah Forestry Department.

The villagers recognize the importance of watershed conservation as a source of clean water supply. The only watershed areas available are located within the Licenced Area. As a consequence, the communities are opposed to logging activities carried out by BTSB within identified watershed areas.

Despite the fact that an increasing number of people of the villagers adjacent to the FMU are now earning wages a substantial portion continues to be dependent on land for subsistence farming. Important functions of the FMU for local people include fishing (15% of the households), harvesting of rattan (60%), hunting (95%), harvesting of medicinal plants (10%), the use of water for consumption (100%), and collection of firewood (15%).

In some of the surveyed villages the communities claimed that the "surrounding lands", including those cultivated inside the Licenced Area, are "customarily" considered as the "common property" of the communities. They insisted that they should be allowed to continue their practices in the cultivated area. However, the SFD does not recognize their claims as NCR claims within Forest Reserves are not recognized under the Sabah Forest Enactment 1968.

Though the communities living adjacent to BLOCK A have initially expressed their dissatisfaction with BTSB and the SFD because they are not permitted to continue their activities within the Licenced Area, about 85% of the households expressed their support to the SFM project, provided they are allowed to continue their practices in the Licenced Area, that their "land rights" are recognized, and they are given priority for employment.

Therefore, the challenge for BTSB is to involve the communities into forestry activities, and also to create business opportunities for the growing population. This would restrain them from further encroaching into the Licenced Area for farming activities. Consequently, it is important for BTSB not only to designate areas for the community to continue farming activities, but also to improve the productivity on these cultivated areas, so that less area is required.

At the same time, BTSB must continue to create employment for the inhabitants of local communities to help raising the level of technical skills and household income. There is also a need to educate and provide training for the villagers, enabling them to participate in forest management activities.

6. Resource description

The majority of the forest area was previously comprised of Upland Mixed Dipterocarp Forests. Lowland Mixed Dipterocarp Forests and Kerangas Forests have almost disappeared over the past decades as a result of intensive logging and unsustainable management practices.

Current timber stocks are sub-divided into the following categories:

- areas established with rubber plantations,
- areas established with *Acacia crassicarpa*,
- areas established with Laran
- areas established with Durian
- areas stocked with degraded residual natural forests, scheduled for clearing, site preparation and replanting under the ITP scheme

Rubber timber volumes from plantations established until 2020 amount to 25,890.52 ha gross and 23,411.02 ha net with an estimated total stem volume of 2,636,206.61 m³, out of which 1,396,153.47 m³ are estimated to have commercial value.

Areas established with *Acacia crassicarpa* total 928 ha gross (800 ha net) in year 2004 currently hold an estimated total volume of 110,139 m³ with a saw log/chip log ratio of 37% to 63%.

As of 2020, areas established with *laran* amounts to an estimated total of 2,935.73 ha gross (1,494.1 ha net) since year 2018 and currently hold an estimated total volume of 4,884.82 m³.

7. Results of Forest Monitoring

Forest monitoring activities in the past were restricted to few elements, mainly covering licence boundaries and forest security, production volumes from timber harvesting, planting and maintenance operations, as well as social and environmental impacts of forest management activities.

Licence boundaries had been monitored throughout the previous and current plan period. Besides some limited encroachment into the FMU area by adjacent local communities no major violations of the company's management rights was documented.

Harvesting volumes were regularly monitored throughout the current plan period and documented on compartment basis.

Environmental Compliance Reporting (ECR) has been carried out by a licenced EIA Consultant, according to the regulations and intervals prescribed by the Environment Protection Department. Key parameters assessed through water samples taken from six different sample locations at 4-monthly intervals include Biological and Chemical Oxygen Demand, Total Suspended Solids, Oil and Grease, Turbidity and Coliform count. Except for BOD and COD partially exceeding threshold values the water quality requirements of the NWQSM Class IIb Standard are mostly within the permitted value scale.

Systematic records of *recyclable waste disposal* exist since year 2014 only. These include steel scrap and scheduled wastes.

In the past, *monitoring of social impacts* was not carried out in a structured and systematic manner.

24 accidents have been reported and documented in the past decade during the 2nd PDP. 11 serious injuries were reported in ITP areas during this period.

A system for *forest fire prevention*, detection and suppression has been developed and is implemented according to the provisions of the *Forest Fire Management Plan (FFMP)*.

The risk of forest fire occurrence in the plantation area has been relatively low due to regular patrolling and monitoring activities. Only during the dry spell of year 2016 forest fires have occurred in several ITP compartments, caused by land preparation of farmers in surrounding villages.

Details of the forest monitoring results are provided in the *Public Summary of Forest Monitoring* as published on the company website.

F. FUTURE FOREST MANAGEMENT

1. Infrastructure development

The ITP gross area of 57,105.9 ha has been subdivided into 140 compartments with an average size of 419.9 ha, based on delineations that mainly follow natural features like ridges, rivers and streams, permanent roads, etc. Individual sizes of production compartments range from 154 to 1,019 ha.

The current road network comprises a total of 1,697.8 km of main and sub-roads roads, resulting in a total density of about 50.02 m per ha, based on a current gross production area of 33,941.8 ha developed in Block a of the ITP area.

The company operates a Base Camp for its NFM and ITP operations in Block A, located within Ulu Sg. Milian Forest Reserve. This Northern Base Camp at Mile 46 is located about 18 km to the west of the junction at Kg. Simpang Empat along the Sook – Tulid public road. It comprises a total area of 45.12 ha, including workshop, storage areas, nursery, water ponds, and quarters for company staff and workers. The *Pandiwan* Base Camp in Block B is located 11.5 km to the east of the public road junction, with a total size of approximately 6.5 ha. This camp supports all operations to be carried out in both NFM and ITP compartments within Block B of Sapulut Forest Reserve. The new southern camp known as Mile 63 Base Camp is also located in Block B and is situated 8km from the public road. The camp's main function is to support the ITP operations to be carried out within the area. Refer to Figure 8.2 for location of these Base Camps. Temporary stumping areas for log tagging and scaling are identified near the planned harvesting areas.

2. Forest zoning and net production area

Within the ITP area, three main forest functions have been identified at individual compartment level:

- conservation and protection functions of various HCV categories
- production function for latex and timber, and
- community use function

The gross production area totals 57,105.9 ha. Compartments comprising 1,973.65 ha (3.4% of the gross area) have been reserved for the purpose of conservation and protection. In addition, protection areas within production compartments add up to another 7,611.15 ha (13.3 %), while community compartments have a total of 1,876.60 ha (3.2%). Once fully developed, the road network including buffers will occupy a total of 4,230.6 ha (7.3%) of the

ITP area. The total size of non-productive areas amounts to 16,641.46 ha or 29.14% of the gross ITP area. The remaining net production area totals 40,464.44 ha 70.86% of the gross ITP area.

3. Management of High Conservation Values and Protection Areas

The overall goal of conservation management is to ensure that all sites with identified High Conservation Values and other areas to be protected according to environmental rules and regulations of the responsible government authorities are effectively protected from encroachment and any other unauthorized activities. These areas have been described, mapped and marked in the field.

The management prescriptions for conservation and protection areas serve to

- ensure the integrity of the identified areas
- enable their undisturbed development
- maintain their associated attributes and values
- enhance these areas to deliver the ecological services, where these had been affected by previous disturbance

Management standards for conservation and protection areas based on HCV categories have been developed, including indicators to be used to determine whether the standard has effectively supported the conservation objective. In addition, HCVF enhancement measures were defined for implementation where conservation areas were affected by disturbance.

Details of the HCVF management concept can be found in the *Public Summary of HCVF Management by Bornion Timber Sdn. Bhd.*

4. Production objectives

In order to re-establish productive forests in the degraded forest areas assigned to ITP these need to be replanted using tree species with proven track record and attractive market value. The company's management objectives have been set as follows:

- i. to establish gross area of 15,000 ha in the degraded forest areas (Block B) with Laran (*Neolamarckia cadamba*), an indigenous fast growing species for timber production;
- ii. to re-establish and optimize the productivity of the degraded forest areas by growing high quality saw logs as a compensation for the losses incurred by natural forest calamities and degradation;
- iii. to maintain rubber forest plantation and enhancing latex production in a sustainable method;
- iv. to manage the plantation area under the principle of sustained yield, and in accordance with the requirements of internationally acknowledged forest certification schemes.

5. Plantation development stages and related activities

The Plantation Development Plan describes four stages of plantation development, together with the necessary activities to be carried out: Planning, Implementation, Rubber Tapping, Replanting.

Species choice

A detailed assessment of *Hevea brasiliensis* as a forest plantation species has been undertaken by BTSB, including a risk-benefit assessment. Based on the results of this study

it can be concluded that *Hevea brasiliensis* is a multiple use tree species with predominantly positive to strongly positive ranking, making it suitable for large-scale planting at industrial level. The identified risks need to be closely monitored to avoid problems in growth and yield performance. In comparison with planting other native timber species in a forest plantation environment, *Hevea brasiliensis* offers substantial and higher benefits.

Additionally, BTSB's intention of reforestation in the forest plantation zone is to plant Laran trees, from two different species, scientifically known as *Neolamarckia cadamba* or White Laran, and *Neolamarckia macrophylla* or Red Laran. Both these species are fast growing, have straight cylindrical boles and small-diameter self-pruning branches (Smiths et. Al., 1994).

The trees are left to grow for 8-10 years before harvesting in order to allow sufficient diameter and bole volume development. No terracing will be carried out, but instead, maintenance paths will be established to aid in stand tending and fertilizing.

Seedling production

The laran nursery plays a significant role, with its key task of developing superior planting material supplying healthy quality seedlings. At the same time, impacts of nursery activities on the environment should be minimized. The rubber nursery is divided into two categories: ground nursery and polybag nursery. In a ground nursery, the plants are planted on the ground, whereas in a polybag nursery, the plants are raised in polybags arranged in rows.

Boundary Marking

This activity is essential to ensure clear ground identification and separation of activities between different parties or contractors. Boundary is carried out for compartments, planting blocks, riparian reserves, steep areas and areas containing High Conservation Values.

Salvage Logging and land clearing

BTSB carries out salvage logging operations as an initial site preparation measure, prior to the establishment of rubber forest plantations. Logging operations must be implemented in a controlled and efficient manner, through minimizing soil disturbance and wood wastage, and maximizing commercial wood recovery. Failure to observe environmental mitigation measures could result in a reduced growth performance of subsequent stands to be established.

Harvesting operations can only be implemented following the completion of activities prescribed for Compartment Boundary Demarcation, Survey of HCVF and Other Protected Areas, as well as Marking of steep areas and Riparian Reserves.

Following the extraction of the residual commercial trees BTSB carries out clear felling operations, i.e. felling of all trees above 2-inch diameter.

Road infrastructure development

A well planned and maintained road network is essential to ensure efficient forest access and operational activities. A well designed road system also plays an important role in controlling and suppressing forest fires. Overall target road density is 40 m per ha.

All road construction activities should ensure that soil movement is kept to a minimum and that preferably no roads are located in steep terrain. Machine operators must be well trained to avoid disturbance of conservation and protection areas, e.g. by pushing soil into HCVF sites, river buffer zones, streams, lakes, swamps, grave yards or other protected/unique sites.

Land Preparation

Planting paths and wood debris stacking needs to be done in areas of more than 15 degrees slope only. The operating teams must strictly comply with the conditions stated in the work specifications and regulations by the company and SFD.

6. Plantation maintenance

Maintenance and upkeep works

In order to keep the trees growing rapidly adequate attention needs to be given to maintenance such as weeding and brushing operations, especially during the first 3 years after planting. Maintenance and upkeeping works are divided into two categories.

Manual Control: manual weeding does not consist of any chemical usage but employs circle weeding, pruning, cover crop control, and blanket slashing.

Chemical Control: chemicals weeding involves the use of approved chemicals based on SFD requirement, consisting of blanket spraying, strip spraying and manuring.

Fertilizing

The objective is to correct soil nutrient deficiencies, to provide an initial boost to laran tree growth, and to maximize growth potential.

Integrated Pest Management

Since the establishment of Bornion Timber Sdn. Bhd, pests and diseases unfortunately played a role especially regarding biotic pests (bark damage by Sambar Deer). In order to ensure the plantation continues to develop without major damages to its performance an Integrated Pest Management (IPM) system has been developed by the company as the framework for prevention and minimising of impacts from pests, diseases, fire and invasive plant introduction.

Growth Monitoring

BTSB has established several Permanent Sample Plots (PSP) at its rubber, laran, and acacia areas and carries out comprehensive research and development in order to improve the product quality and latex yield. PSPs allow regular re-assessment of the same trees in the field. The purpose of these repeated measurement is to monitor the performance of tree growth, impacts of fertilizer dosage on tree diameter and volume growth, latex yield, as well as monitoring health status and occurrence of any diseases and other factors influencing growth and productivity. Additional PSPs will be established according to the progress of plantation development.

7. Rehabilitation of residual natural forest

Where required enrichment planting of poorly stocked areas of residual natural forests will be carried out as identified during diagnostic field sampling. Only indigenous timber species are permitted for planting, with an emphasis on the use of RTE species. At the current stage the areas to be rehabilitated still need to be identified through field sampling. However, it is expected that in most of these residual natural forests sufficient natural regeneration is still on the ground that can be treated through silvicultural methods.

8. Latex production

Rubber/latex production is scheduled commence in the 5th to 6th year of planting for the next 25 years for each phase of planting. As the last planting year of rubber in 2018, Table 8.9 provides an estimated latex yield for this PDP.

9. Timber production

Future timber harvesting volumes will be generated from three different sources:

- a. from salvage logging operations for plantation development
- b. from harvesting of matured *Acacia crassicaarpa* stand, and
- c. from harvesting of rubber timber
- d. from harvesting of laran

Volumes from a. and b. above will be harvested during the current plan period, whereas timber resources from rubber stands would only be harvested as from year 2037 onwards, unless latex prices continue to be depressed over an unpredictable period. In this case harvesting of rubber stands would be implemented at an earlier stage, but not during the current plan period. And Laran stands would only be harvested as from year 2033 onwards.

Schedule for salvage logging operations

During the remaining plantation establishment period of years 2022 to 2023 a net area of about 2,294.3 ha will be harvested which will produce an average volume of 166,038.5 m³, based on an average extractable volume of 72.37 m³ per ha.

Schedule for harvesting Acacia crassicaarpa stands

The *Acacia crassicaarpa* stands planted in year 2004 had not been silviculturally managed and hence, diameter growth has not met with expectations. The stands will be harvested as soon as most of the trees have reached diameters well above the minimum saw log diameter limit. Harvesting of the *Acacia* area can be carried out in year 2022. The harvesting operation is expected to yield a total volume of 124,583 m³, out of which approximately 55,435 m³ consisting of saw logs and 69,144 m³ consisting of chip logs. These estimates were verified through a stand inventory to be conducted during year 2017.

Schedule for harvesting Rubber stands

A timber yield forecast has been undertaken using preliminary yield tables for *Hevea brasiliensis* developed in early 2016. The results of the underlying growth and yield study are based on growth observations in Permanent Sample Plots (PSPs) up to an age of 7 years, and on literature review and published analyses of rubber plantation growth in Southeast Asia.

Assuming stand growth development will be according to the growth projections harvesting operations are expected to commence by year 2037. Exemptions from this scheduled harvesting include latex yield well below target, or stand damages caused by biotic or abiotic damage.

Harvesting volumes will be low in the first harvesting year due to the small area achieving maturity but will quickly accelerate in the 2nd and 3rd year, and gradually stabilize thereafter according to the matured area available for harvesting. Average harvesting volumes will be around 212,508.97 m³ per annum, unless stem numbers, growth performance or commercial bole heights significantly differ from the assumptions made in the yield tables.

Between years 2037 and 2048 total standing timber volumes of *Hevea brasiliensis* will amount to approximately 5.5 million m³ with a corresponding commercial volume of about 2.5 million m³.

Schedule for harvesting Laran stands

A timber yield forecast has been devised using preliminary yield tables for *Laran* (*Neolamrckia cadamba*) developed by using data and information collected from Forest Management Units of Sarawak.

Assuming stand growth development will be according to the growth projections harvesting operations are expected to commence by year 2033. Exemptions from this scheduled harvesting include stand damages caused by biotic or abiotic damage.

Average harvesting volumes will be around 113,409.15 m³ per annum, unless stem numbers, growth performance or commercial bole heights significantly differ from the assumptions made in the yield tables.

Between years 2033 and 2046 total standing timber volumes of *Laran* (*Neolamrckia cadamba*) will amount to approximately 1.5 million m³.

10. Timber harvesting methods

All operations related to tree felling, log extraction and transport from the plantation will be carried out using best management practices employing Reduced Impact Logging (RIL) technology. The management objectives are formulated to achieve long-term sustainability of timber and non-timber production with the least possible impact on the forest environment:

- (1) Safety and health of all personnel involved in timber harvesting operations shall be ensured at all times, based on the company's SOP.
- (2) Timber harvesting systems, methods and technologies shall be directed to minimize any negative effects on conservation and protection areas, as well as soil structure and soil fertility.
- (3) The recovery of commercial wood shall be maximized to realize optimum returns from the sale of rubber wood logs.

11. Replanting of harvested stands

At this early stage of plantation development it is premature to determine the scope and scheduling of replanting operations in detail. Currently, BTSB plans to continue planting rubber or laran following the completion of the first rotation, though this will depend on a general performance assessment to be carried out towards the end of the scheduled 15 and 30-year rotation respectively. Replanting operations will closely follow the harvesting operations which will help to keep harvested areas free of competing vegetation and hence, reduce the need for pre-plant sprays or manual weeding operations. For maintaining yield sustainability the targeted annual gross harvesting area of 2,000 ha will also require an annual replanting operation of similar size.

Wherever possible, the commercial and ecological value in the second rotation of the plantation shall be further enhanced. The company will also continue to contribute in improving and enhancing the livelihood and wellbeing of its staff and workers sourced from local communities. The technical production objective is assumed to stay focused on high-yielding timber-latex clones producing quality saw logs to be grown within a rotation period of

25 to 30 years. In case latex prices would remain at continuously depressed levels making rubber tapping commercially not economically viable the latex production would be discontinued. Rotation period would be shortened to around 15 years with rubber timber production as the key management objective.

12. Forest fire control

During prolonged periods of drought forest fires constitute a major threat to the plantation area as forest plantations are more susceptible to fires compared to natural forests. The period from March to September is critical where monitoring activities need to be stepped up.

Several approaches to forest fire management are applied in and around FMU No. 11. BTSB's management approach employs an Integrated Forest Fire Management (IFFM) System whereby all aspects of prevention and suppression are dealt with in a holistic manner. Effective and efficient forest fire prevention and suppression (firefighting) can only be carried out when proper procedures, resources and facilities are in place and put into operation. A Forest Fire Management Plan prepared for year 2022 to 2033 regulates the details of forest fire control in the FMU.

13. Community Support and Development Programme

The community development approach taken by BTSB focuses on the following key points:

- provision of suitable land for crop cultivation and/or animal husbandry
- permission to continue to settle in the Licenced Area for communities that already were established before the license was issued to BTSB (Kg. Wawasan in particular)
- priority is given by BTSB management to economic development activities, including improvement of in physical and social infrastructure, as identified by needs analysis
- employment priority to qualified job applicants from nearby local communities
- awarding service and maintenance contracts by BTSB to individuals or small companies originating from adjacent communities, e.g. for plantation maintenance works, forest survey and inventory works, and planting activities

Further steps to be taken by the company include effective control of forest encroachment and management of claims over Native Customary Right (NCR) in close collaboration with the responsible government agencies.

The long-term community support and development programme adopts a strategy to

- improve the social and economic environment of the local communities;
- raise the level of skills and technologies used by local communities (especially the youths);
- provide the local communities with a standard of living and lifestyle comparable to more developed villages in Central Sabah;
- change people's mind set from basic subsistence farming to more environmentally friendly, productive and profitable agricultural activities

Direct community assistance projects supported by the company include road infrastructure development, social and physical infrastructure, Agro-Forestry, and rubber cultivation.

Continuous dialogues with the communities shall be held especially pertaining to

- strengthen community cohesion and good neighbourhood,
- increasing efforts to protect natural forest encroachment,
- strengthening community interest and participation in community project development and implementation
- setup and operation of the Milian Sapulut Community Forestry Committee (MSCFC) for permanent community liaison, project identification, coordination and implementation monitoring

14. Research and development

Research and development activities form an essential element of sustainable forest management and continuous improvement of current practices. The company will prioritize R&D activities as described in the following sub-chapters. These components comprise BTSB's designated research and development programme.

During the remaining plan period R&D activities shall focus on the following tasks:

- (1) To enhance and refine harvest planning and undating of net production area for individual compartments, considering steep and inaccessible areas, as well as environmental sensitive sites through the improvement and updates of detailed Digital Surface Model (DSM) and Digital Terrain Model (DTM), and improved topographical maps;
- (2) Continuous Growth Monitoring System to be continued to enable the regular estimation and updating of BTSB's timber stocks by species and size classes
- (3) Minimize negative environmental impacts caused by site clearing and preparation for planting:

These research and development objectives will be achieved through full dedication to the identified tasks, and firm commitment of BTSB's management and staff.

15. Organization and Manpower

The overall company management of BTSB is guided by a Chief Operations Officer (COO) who is directly supported by a Senior Operations Manager cum Director. He directs the Managers who oversees the day to day operations of all company Divisions. The Managers is assisted by Head of Unit heading the following Divisions of the company:

- Finance and Administration Division, comprising 6 Units
- Production Division, comprising 2 Unit
- Forest and Plantation Management Division, comprising 6 Units
- Survey and Enforcement Division, comprising 2 Units
- Research and Development, Environment, Safety and Health Division, comprising 3 Units

The current operational manpower at the field camp sites comprises a total of 665 staff. A breakdown of the BTSB-ITP staff by origin and gender is available.

As shown in this Table about 624 employees or 94% of the workforce originate either from local communities in the vicinity of the FMU or from other places in Sabah, meaning that BTSB is a major employer in Central Sabah providing job opportunities and giving preference to the employment of local people.

In terms of employment by gender the majority of BTSB's staff is male (82%), which is typical for companies involved in plantation resource management. However, the company also employs a significant number of female staff (122 employees, 18%) working in the technical as well as in the service and support units at the Mile 46 Base Camp, at the Pingas Camp, at the Pandiwan Camp, as well as at the Sapulut Camp.

16. Training and Human Resource Development

Professional and technologically advanced forest management can only be implemented with a well-trained pool of company staff, skilled contractors and forest workers. Hence, the company policy is to continuously develop its human resources by conducting internal and external training courses and briefings in all necessary fields of practical forest operations and administration.

The need for training measures will be identified through individual staff performance assessments conducted by the heads of Divisions, and through specific training needs assessment carried out by the HR Unit of the Administration Division, where necessary. The training programme will focus on identified high priority topics.

All training subjects, priorities and timing of training components are planned and coordinated by BTSB's Administration Division.

17. Safety and Health

The company management has also developed its own Safety and Health policy. A S&H Committee oversees the implementation of the policy and standards for implementation. The necessary type of Personal Protective Equipment (PPE) to be used by the company staff and workers is specified by job categories and risk exposure. The appointed S&H Officer conducts regular training courses and briefings, as well as field monitoring to ensure all staff fully understand and comply with the respective company policies and safety requirements at the work site.

18. Monitoring system and Operational procedures

A monitoring, compliance and evaluation (MC&E) system forms a standard component of the forest management system described in this Forest Management Plan. Continuous MC&E activities shall systematically observe the implementation activities, their effects and frame conditions on the basis of plans, targets and objectives (PDP, Annual Operation Plans), followed by a documentation of the relevant data and information collected, and a subsequent evaluation of the achievement of scheduled activities.

The monitoring objectives include

- the control of forest operations, including the performance of own staff and contractors
- the identification of under- or over-achievements, to determine the causes and to take action to rectify the situation through future plan adjustment
- the detection of inefficiencies, shortcomings, and fraud
- the provision of information for evaluation and future revision of the Forest Management Plan, and/or Annual Operation Plans

The results of the MC&E activities will be presented and discussed with relevant managers for corrective action and improvement, as considered necessary. A list of monitoring elements is provided in the PDP and a comprehensive database that is available from the company website.

Another component of the MC&E System is the Compartment and Block Register currently under development. All current data and information as well as operational planning and implementation data are to be compiled and summarized in the Register.

All important planning and operational activities are described in a comprehensive set of Standard Operating Procedures (SOP). SOP's are important documents describing objectives, responsibilities and work procedures to be implemented in a systematic manner.

The *results of BTSB's ongoing monitoring activities* are published on the company website.

19. Plan review

The objective of the prescribed mid-term plan review is to ensure that the foundation of the planning framework remains intact and accords with changes in the production environment that might affect the viability and profitability of the timber business. In consequence, the PDP will need to be periodically adapted to avoid that this fundamental planning instrument continues to remain relevant for implementing approved management activities on the ground.

This Plantation Development Plan for the ITP Sub-Management Unit has been developed in year 2021. Changes to the assumptions and conditions of resource management need to undergo a full review and update in the mid-term review by 2027, after all necessary input data for a comprehensive review are available.