EXECUTIVE SUMMARY

This manual has been prepared to illustrate the objectives, policies and actions taken by Lalan Rubbers Agri Division (LRAD) in managing of their Forest Management Units (FMUs) in addition to the information provided in the Forest Management Plan (FMP) prepared for the period of 2018-2022. Detailed information on FMU details and surroundings, Landscape, environment and climate, Different crops maintained, past and present management, inventory and growing stocks of timber trees, harvesting schedules etc. are given in the FMP. This manual contains information on rest of the actions conducted to achieve the sustainability, especially in accordance with the guidelines stipulated by Forest Stewardship Council.

CHAPTER 01: INTRODUCTION

The management of LRAD is committed to the implementation of Sustainable Forest Management principles and practices, because the management trusts that the company's long-term survival depends on the forestry operations which are economically viable, environmentally sustainable and socially acceptable. Therefore LRAD strives to conduct forest management operations in conformity with the laws and regulations of the government of Sri Lanka and relevant international agencies.

The present FSC manual was prepared as a supplementary document for the forest management plan (FMP) of 2018-2022. Different chapters of this manual illustrates the FMUs, management procedures, contribution to the wellbeing of employees, stakeholders, society and aspects of the conservation of biodiversity and the preservation of nature while earning significant incomes.

At present, LRAD manages 8,733.76 ha of lands in 15 different Estates under 5 Groups, viz., Mahaoya, Miyanawita, Sapumalkande and Udabage of Deraniyagala area and Pitiyakande of Mawathagama area. Miyanawita and Dabar Estates are managed by LRAD as a project with Bogawanthalawa Tea Estates PLC, which was by an agreement reached between the two companies on 10th October 2012. LRAD considers all those estates as a single Forest Management Unit (FMU) and each Group as a Sub-FMU.

The vision of the LRAD is to conduct the long-term sustainable forest management operations in line with the Principles and Criteria of the FSC to be motivated by the desire of having the FSC certification. In accordance with this vision, LRAD does not manage any plantation established on any form of natural forest after 1994. In addition, the management of LRAD is not responsible for conversion of any form of natural forest to other landuses including plantations.

CHAPTER 02: COMPLIANCE WITH LAWS AND FSC PRINCIPLES AND CRITERIA

All forest management activities of Lalan Rubbers Agri Division (LRAD) have been designed in compliance with the company's forest management objectives formulated based on the FSC Principles and Criteria. The management actions implemented to achieve those objectives are in compliance with the relevant laws of Democratic Socialist Republic of Sri Lanka, regulations formulated by Sri Lanka Forest Department, Department of Wildlife Conservation, Central Environmental Authority, Forest Stewardship Council, Plantation Management and Monitoring Division of Ministry of Plantations Industries and other relevant international agencies.

2.1 Compliance with applicable laws and regulations at national and local levels

Many departments/ agencies of Sri Lanka have formulated laws/ regulations relevant to the forest management activities varying from land use to the labour handling. LRAD assures the compliance with all those laws/ regulations in FMU to ensure the protection of the legal status/ regulations, which have been formulated by those departments and agencies. The followings are applicable to forest management in the country.

i. National Environment Act No. 47 of 1980: Amended in 1988 (56)
ii. Forest Ordinance No. 16 of 1907: Amendment Act 1988
iii. Land Settlement Ordinance 1931
iv. Land Development Ordinance 1935
v. Crown Land Ordinance No. 8 of 1947
vi. Fauna and Flora Protection Ordinance No 2 of 1937: Amended in 1933
vii. Policy for Wildlife Conservation 1990
viii. Soil Conservation Act No 25 of 1955: Amended in 1955 and 1981
ix. National Heritage and Wilderness Areas Act No. 3 of 1988
x. Industrial Disputes Act 1950 and 1966
xi. Trade Unions Ordinance 1935

xi. Factories Ordinance 1942

xii. Shop and Office Act 1954

In addition to the above, the copies of following agreements are maintained at the Group Offices of each FMU.

i. Trade union agreements

ii. Workers' collective agreement

iii. Staff collective agreement

2.2 Compliance with applicable laws and regulations at international level

Sri Lanka is a signatory to many international conventions and some of them are directly relevant to the forest management operations of the country. LRAD conducts forest management activities in accordance with those relevant laws and guidelines, especially of the following agencies. The copies of those international conventions are available in the office of each Sub-FMU.

i. ILO (International Labour Organisation) Conventions 87 and 98

ii. CITES (International Trade in Endangered Species of Fauna and Flora) Convention

iii. ITTO (International Tropical Timber Organisation)

iv. CBD (Convention on Biological Diversity)

2.3 Compliance with FSC Principles and Criteria

Management plans and all forest management operations of the Sub-FMUs of LRAD are in compliance with FSC Principles and Criteria to ensure minimum damages to FMU, environment and to the wellbeing of the society.

The management of the LRAD takes every effort to make its staff, workers and contractors to be familiarised and comply with the laws and regulations mentioned in the above sections. The awareness of the workers is increased at the Muster Meetings conducted by the Manager or Assistant Manager of Sub-FMU in every morning before starting the scheduled work. The awareness of the contractors is increased by mentioning the necessary information in the contractor documents and discussions held with them.

CHAPTER 03: FOREST MANAGEMENT OBJECTIVES/ POLICIES

Forest management objectives have been formulated to ensure economically viable, environmentally friendly and socially acceptable activities to be conducted in all Sub-FMUs of the LRAD. Further, those objectives have been formulated in compliance with the laws and regulations available at international, national and local levels and FSC Principles and Criteria. Therefore LRAD sticks to obtain sustained yields of non-timber products and timber harvesting continuously to be less than the rate of its long-term replacement. The species selection and species composition are also maintained in accordance with the regional landscapes.

3.1 Forest management goals

The long-term management goals listed below are planned for the FMU are based on carefully formulated forest management objectives. This is reinforced by the commitment of LRAD for the Sustainable Forest Management (SFM), proper maintenance of the environmental and forest conditions within the forest area, improvement in the socio-economic conditions of the workers and the local communities in the area.

i. Protection goals

It is guaranteed by LRAD that the extent and quality of the forest area where high level of protection is required are maintained in such a way that the usual forest management will not diminish biodiversity and ecological sustainability of the area causing negative impacts to the environment.

ii. Economic goals

It is ensured that the FMUs are managed in such a manner to maximise the level of income required to meet the social, environmental and operational costs of maintaining the forest area, while conforming to practice and promote sustained yield obtaining methods from the resources while minimising the negative impacts on the environment and society.

iii. Environmental goals

Physical environment, biodiversity and aesthetic value are preserved during the forest management operations, especially at the timber harvesting periods by minimising potential damage, enhancing the conservation and the restoration of the forest lands.

iv. Social goals

Socio-economic and cultural needs of the communities are realised in terms of access to NTFP's, training for jobs, observance of their customs and traditions as well as creating safe working environment and favorable conditions for the forest workforce.

3.2 Forest management objectives

The following objectives have been formulated by the LRAD management to ensure the sustainable management of FMUs in the long-run.

i. To ensure an efficient latex production through improved planting of selected recommended clones and tapping systems as per the guidelines of Rubber Research Institute while harvesting timber, fuelwood, coconut, oil palm and cinnamon on an annual sustained yield basis depending on the guidelines given by the relevant authorities and FSC standards.

ii. To ensure the diversification with suitable other crops mainly where the existing crops do not perform well or to enhance the economic values by maximum utilising the lands. These approaches are carried out with consideration of biological diversity conservation and social stability.

iii. To protect the lands against degradation due to soil erosion, floods, landslides and other effects of ecological imbalance.

iv. To obtain periodic revenue from timber production on sustained yield basis, while providing habitat for fauna and flora.

v. To contribute to the growth of the local and national economies by developing forest management actions and forest based industries and creating opportunities for income generation and employment.

vi. To meet the people's basic needs for fuelwood, fodder, timber and other forest products and to contribute to food production through an effective interaction between forestry and farming practices.

vii. To improve the water quality and to increase soil productivity.

viii. To increase wood production from plantation forests to meet domestic and export demands as raw materials, reducing reliance on natural forest extraction.

ix. To minimise the environmental damage that can be caused due to the forest management activities, especially at the harvesting periods.

x. To conserve the natural forests, High Conservation Value Forests (HCVFs) and other culturally, religiously, historically and socially valuable lands located inside the Sub-FMUs.

xi. To enhance the natural regeneration and restoration of the degraded lands located within Sub-FMUs.

xii. To provide the benefits to the society by allowing the collection of certain NTFPs such as greens, fuelwood etc. to the dwellers in surrounding of the FMUs.

xiii. To protect the Sub-FMUs from illegal activities and other damages with the association of different stakeholders.

3.3 Policies used by the LRAD

Policies are essential instruments to achieve the objectives formulated for the forest management. Each office of the Sub-FMU of LRAD maintains a separate document with the following policies. Those policies have been formulated ensuring the compliance of the laws/ regulations formulated at international, national and local levels and in compliance with the FSC Principles and Criteria.

i. Chemical and oil – book keeping
ii. Health and safety
iii. Common practices
iv. Publicly available information
v. Contracts for contractors
vi. Dead wood
vii. Monitoring and evaluation
viii. Sensitive sites
ix. Waste management
x. Wildlife
xi. Protected forest
xii. Latex tracking
xiii. Wood tracking
xiv. Trade union and social issues
xv. Illegal issues and guarding the forest
xvi. NTFP
xvii. Diversification
xviii. Planting, felling and post-felling site management
xix. Management of manufacturing facilities
xx. Sale of FSC certified products to outside parties
xxi. Controlling of rodents in oil palm fields

CHAPTER 04: DESCRIPTION OF THE FOREST MANAGEMENT UNITS

4.1 Sub-FMUs (Estates) managed by LRAD

Lalan Rubbers Agri Division (LRAD) is a subsidiary of Lalan Rubbers Pvt. Ltd, LRAD manages 8,733.76 ha of lands in both Deraniyagala and in Mawathagama (Kurunegala) area comes under Kegalle and Kurunegala districts respectively. Altogether 15 estates are managed as Sub-FMUs by LRAD, which are clustered into five Groups, namely, Mahaoya, Sapumalkande, Udabage, Miyanawita (Deraniyagala) and Pitiyakande (Mawathagama). The company is diversified into several crops such as Rubber, Tea, Coconut, Cinnamon, Oil palm as well as timber. Thereby in addition to the profit oriented production goals, the management of the company is committed to take measures to protect biodiversity and conserve nature in the estates and surroundings and support to enhance the social status of staff, workforce and other relevant stakeholders.

4.2 Species used in FMUs

LRAD Estates, named as Sub-FMUs from this point described in this management plan are mainly maintained for the agricultural purposes and therefore the most common species are Rubber, Cinnamon, Tea, Coconut and Oil palm. In addition, a considerable amount of fruit and other trees are grown in the estate lands and forest plantations are also common. Certain conservation areas are also maintained as LRAD recognises the value of the landscape, environment, ecology and biodiversity. Table 4 of the FMP illustrates the species and their extents in the Sub-FMU lands of LRAD as at 31st Decvember 2016. Extents for timber trees are not given in many Sub-FMUs because those trees were grown in scatter manner in the fields, around bungalows and other buildings, fences or roads.

i. Rubber

Rubber is the main crop of all Sub-FMUs managed by LRAD in the five Groups. Latex is the main purpose of managing rubber in these Sub-FMUs and once the trees stopped producing latex, they are sold to contractors. Extents of rubber fields in each division are given in Table 4 of the Forest Management Plan.

ii. Timber

Timber blocks are maintained to sell for timber. The main species grown in those timber blocks are African mahogani (*Khaya senagalensis*), Albizia (*Albizia* sp.), Eucalyptus (*Eucalyptus* sp.), Lunumidella (*Melia azedarach*), Mahogani (*Sweitenia macrophylla*), Teak (*Tectona grandis*) and Torreliana (*Eucalyptus torreliana/ Corymbia torreliana*). Those timber blocks are managed in scientific manner and further details are available in the FMP of LRAD. Although most of the species used in timber blocks are exotic, those have been selected as per with the recommendations of the Sri Lanka Forest Department due to their adaptation to the regional conditions, high growth rates and thereby shorter rotation periods and ease of management. Almost all commercial timber plantations managed by Sri Lanka Forest Department are also exotic which indicates the trend of the policy decisions taken at country level favouring the exotic species over the indigenous ones.

In addition to the timber blocks, LRAD maintains a large number of timber trees grown in scatter manner in the Sub-FMUs. Those are also harvested for commercial purposes by using selection felling system. Further details of tree selection for harvesting are available in the FMP of LRAD. The details of different tree species grown in LRAD lands are given in Table 5 of FMP.

iii. Coconut

Coconut plantations are managed for obtaining nuts. However, after ending of producing nuts, after 60 years, those trees are sold to the contractors for the harvest. Extents of rubber fields in each division are given in Table 4 of the FMP.

iv. Oil palm

Oil palm is managed for nut collection for the extraction of oil. This is a new trend of almost all plantation companies in Sri Lanka, which is also supported by the government of the country. The current extents of Oil palm grown in LRAD lands are given in Table 4 of FMP.

v. Cinnamon

Sri Lankan cinnamon has made a mark in the world market. Therefore LRAD maintains significant amounts of cinnamon plants in most Sub-FMUs to earn income (Table 4, FMP).

4.3 Ownership of the forest resources

Lalan Rubbers (Pvt) Ltd is registered as a Private Limited Company under registration number PV15121 on 12th August 2009 in Government of Sri Lanka. The estates listed in Table 1 have been sub-leased to Lalan Rubbers (Pvt) Ltd by Bogawanthalawa Tea Estates PLC for 53 years which expires in 2045. Golden Share Holders (Secretary Treasury) of the Government of Sri Lanka was granted their approval via their letter dated 10th February 2010 issued by the Secretary Ministry of Planation Industries.

Janatha Estates Development Board, a body corporate established under the State Agricultural Corporations Act No. 11 of 1972 leased the estates listed in Table 1 to the sub-lessor by the respective deeds of lease also described in Table 1.

Table 1: Ownership of the estates

Name of Estate	Deed of Lease
1. Densworth estate	No. 466 dated 5th August 1996 attested by D.C. Peiris N.P.
2. Eila Estate	No. 216 dated 5th August 1996 attested by Oshadi J. Kottage N.P.
3. Illuktenne estate	No. 1624 dated 17th January 2005 attested by DC Peiris N.P.

4. Keppitigala estate	No. 156 dated 25th January 1995 attested by Oshadi J. Kottage N.P. as amended by Indenture bearing No 1524 dated 25th July 1995 attested by M.H.D. Amaratunga Notary Public of Colombo
5. Mahaoya estate	No. 439 dated 30th April 1996 attested by Daphne Chandrika Peiris N.P.
6. Muwankade estate	No. 158 dated 25th January 1995 Oshadi J. Kottage N.P. as amended by Indenture bearing No 1524 dated 25th July 1995 attested by M.H.D. Amaratunga Notary Public of Colombo
7. Nottinghill estate	No. 133 dated 4th May 1995 by M.M.C Mutugala N.P. as amended by Indenture bearing No 1524 dated 25th July 1995 attested by M.H.D. Amaratunga Notary Public of Colombo
8. Pitiyakande estate	No. 135 dated 4th May 1995 attested by M.M.C. Mutugala N.P. as amended by Indenture bearing No 1524 dated 25th July 1995 attested by M.H.D. Amaratunga Notary Public of Colombo
9. Reucastle estate	No. 210 dated 5th August 1996 attested by M.M.C. Mutugala N.P.
10. Sapumalkande estate	No. 206 dated 30th April 1996 attested by Oshadi J. Kottage N.P
11. Udabage estate	No. 184 dated 12th March 1996 attested by M.M.C. Mutugala N.P.
12. Udapola estate	No. 1626 dated 17th January 2005 attested by D. C. Peiris N.P.
13. Woodend estate	No. 1628 dated 17th January 2005 attested by D.C. Peiris N.P.

In addition to above, Miyanawita and Dabar estates are managed by Lalan Rubbers (Pvt) Ltd under a joint venture agreement with Bogawanthalawa Tea Estates PLC, which was formed by an agreement between two companies on 10th of October, 2012.

The above estates owned by the Janatha Estates Development Board had been assigned to Bogawantalawa Tea Estates Plc. (Successors of Bogawantalawa Plantations Ltd) by Gazette Extraordinary No.720/2 dated 22nd June 1992. Separate leases in respect of each estates has been signed by the owners (JEDB) giving lease rights of these properties for a period of 53 years as from 22nd June 1992.

4.4 General history of the property

All these estates were nationalised by the Government of Sri Lanka by LRC Act No. 1 of 1972 from those who had land more than 50 acres and by the LRC Act No. 39 of 1975 took over land owned by Sterling companies and Rupee companies. The lands sub-leased to Lalan Rubbers Pvt Ltd by Bogawantalawa Tea Estates PLC were mainly Rubber properties and few extents of Coconut and Tea.

CHAPTER 05: FOREST MANAGEMENT SYSTEMS

LRAD manages all Sub-FMUs as in compliance with the FSC Principles and Criteria to ensure the sustainability. In addition, all activities are in compliance with relevant international, national and local level laws and regulations. LRAD management is also aware of the environment limitations as listed in the following sections. Due to those limitations, LRAD management is also aware of the need of preservation of the environment while conducting the forest management activities.

5.1 Environmental limitations

i. Air quality

Clean air is essential for supporting life on earth by enabling animals to breathe and plants to photosynthesise. Limiting the pollutants in the air to acceptable levels is necessary to support good health. As a national requirement in Sri Lanka, emissions from industrial processes or transport are tested by accredited personnel and maintain in the acceptable level. LRAD provides adequate ventilation to all employees in their work places.

ii. Soil

Quality and quantity of the soil is often overlooked, but those are critical foundations for crop and other resources development. In addition those are the foundation of the landscape and associated leisure activities and cultural identity. Those properties also enable the production of food, fibre and other raw materials. Perhaps less obviously, soils act as a valuable habitat and regulator of life. Soils host a wealth of organisms which together provide the life supporting benefits of rich biodiversity, and they store and regulate water and air. Soil conservation is very important and exploitation must be controlled and conservation measures must be implemented according to the soil conservation act. As a policy LRAD takes all possible measures to conserve the soils in all Sub-FMUs, especially at the timber harvesting periods.

iii. Water

Water is essential for supporting all life forms. Humans use water for drinking, washing, producing food, industrial processes and maintaining the general quality of life. The quantity, quality, distribution and ecological status of water resources are all vital, and the use of water as a resource should not damage our natural environment. Human creates much pressure on water resources through demand, pollution, landuse, water availability, water quality, and flooding. As a policy LRAD protects and carefully looks after the available water resources within the Sub-FMUs for the benefit of the community.

iv. Biodiversity and important habitats

Biodiversity is the term used to describe the wealth and variety of life on earth, its plants and animals (including humans) and their habitats. As well as having an innate right to exist, the ecosystems provide many vital services for the survival of life which may also be known as 'ecosystem services'. The services provided by biodiversity extend well beyond those which all grown and reaped, and a healthy natural environment is a complex and interactive system which human being depends on their lives, health and identity. Therefore the high-quality biodiversity and habitats should be maintained and enhanced to avoid species loss. Moreover, they must be well maintained by restoring functional connections between habitats to avoid the 'fragmentation' which threatens populations and individuals through isolation.

v. Landuse

The Foresight Land Use Futures report notes that "the ability of given parcels of lands of landscapes to deliver multiple benefits simultaneously which is called 'multi-functionality' adds to its value and versatility". Pressure of human being is immense on the land for various purposes which cause the resource degradation and depletion reducing the land quality. Lands that can be used for agriculture and forestry are limited and therefore LRAD believes the need of a careful land management and planning system to protect the land quality.

vi. Noise and light

Peace and quiet and the natural light cycle of day and night are important for the mental and physical health and wellbeing of humans and other animals.

Noise pollution caused due to various activities disrupts wellbeing of the humans and animals. Light pollution is the alteration of natural light levels in the outdoor environment due to artificial lighting, such as the light emitted from buildings, street lights, security lights and illuminated sporting venues.

LRAD does not alter natural light conditions of Sub-FMUs in significant manner. Moreover, all Sub-FMUs are located in remote areas so that the noise generated due to rare cases such as tree uprooting does not cause much impact. All LRAD factories are operated with the environmental protection licences issued by the Central Environmental Authority and therefore the noises generated from the factories are kept below the hazardous limits.

vii. Climate change

Climate change is not just an international issue. It also poses problems for communities and local areas due to making vulnerability for environmental hazards such as flood, water shortage and other health and wellbeing risks.

Due to the maintenance of a large number of trees in sustainable manner, LRAD contributes to the absorption of atmospheric CO_2 which is responsible for increasing the global warming. In addition, the protection measures taken will minimises the landslide and pollution risks.

5.2 Species selection and diversification

i. Crop diversification

Diversification of the species is essential to mitigate the risks in forest management, because monocultures may often generate risks due to the market failures, insect/ pest attacks, growth

related issues etc. Therefore LRAD recognised the value of diversification which is, however, be done without harming the environment or damaging the landscape level values.

This diversification highly promotes the use of non-timber forest products rather than timber products. The examples are rubber latex, coconut nuts, oil palm seeds and cinnamon.

ii. Species selection

All species, i.e., rubber, timber, coconut, oil palm and cinnamon have been selected based on the recommendations of the relevant authorities or scientists after conducting proper studies. Those agencies are given below.

Rubber research Institute
Forest Department
Coconut Research Institute
Department of Export Agriculture

The agencies mentioned above recommended suitable species for each region of Sri Lanka based on the overall stability and the suitability of landscape level. Therefore there is a consistency of the forestry blocks with the regional landscape. All species and the numbers are recorded and the growth rates are continuously monitored in each FMU using representative sample plots.

Like most of the plantation companies in Sri Lanka, LRAD uses exotic species, especially as timber crops. Those species have been selected due to high commercial values, faster growth rates and high adoptability to the regional conditions. Those crops have been recommended by the Sri Lanka Forest Department, Department of Agriculture or Export Development Board. More details of the selected crops are given in Section 4.2 in this manual. The management also ensures the control of further spread of those exotic species beyond the areas where they have been grown using a strict monitoring system.

iii. Natural regeneration and succession

LRAD encourages the growth of native species in all conservation and high conservation areas and non-commercial lands. Further information about the use of relevant species is given in the Biological Assessment and Forest Management Plan.

FMU manages more than 5% of the lands as the conservation areas. Natural regeneration of native species and natural succession is encouraged and commercial management activities are not conducted in those areas and the values of biological diversity are assessed at regular intervals. Moreover, the results of those surveys are compared with the remarkable/ national level ecosystems present in the area to obtain information on the present situation.

5.3 Land selection policy for operations

Other than the conservation areas, culturally, historically, socially or religiously important lands have been identified and mapped in all LRAD Sub-FMUs with the assistance of experts and the stakeholders. LRAD management ensures that no commercial activity is conducted in those areas which have been totally demarcated for the services to the worker community or to the society.

Management of LRAD is aware of the values of indigenous rights and the lands which contains the indigenous rights. However, typical indigenous “Vedda” communities are not present in the entire region and therefore LRAD management assumes the local community as the indigenous community.

5.4 Forest products and services

As shown in Table 2, LRAD manages its plantations mainly to obtain non-timber forest products (NTFPs). However, the trees of timber plantations and other plantations managed to obtain NTFPs are sold for timber at the maturity. In addition, many services, both to the environment and society are supplied by those FMUs (Table 3, 4 and 13).

Table 2: Non-timber forest products.

Species	**Product**		
	Main non-timber	**Other non-timber**	**Timber (at maturity)**
Rubber	Latex	Fuel (fallen branches)	Stem
Coconut	Nut	Fuel (fallen leaves)	Stem
Oil palm	Nut (seed)	Husk	---
Cinnamon	Bark	---	---
Timber	---	Fallen branches	Stem, main branches

Table 3: Main services of Sub-FMUs.

Environment	**Society, workers**
Biodiversity protection	Fuelwood
Erosion minimisation	Food (staple, greens)
Aesthetic value	Medicine
Clean air	Drinking water
Water quality	Pasture
	Access
	Recreation

* Details of the services provided in each Sub-FMU to the community are given in Table 14.

5.5 Silviculture systems

All commercial plantations are managed by LRAD as even-aged monocultures in all Sub-FMUs. Clear-cut silviculture system is used for rubber, coconut, fruits and timber blocks. Cinnamon harvest is done by using selected shoots leaving at least three stems on the ground. However, the main purpose of cultivating rubber and coconut are latex and nuts respectively and therefore obtaining timber are not prioritised. Further details of harvesting systems are given in the Section 6.2 of this manual.

i. Yield calculations and preparation of harvesting schedules

Rubber Research Institute has detailed guidelines for harvesting rotations for rubber. These are based on years of research for all different species and clones. LRAD is following these guidelines to manage rubber plantations. In general a rubber wood rotation is between 25-35 years, depending on the clone.

Coconut is harvested at 60 year maturity as per the guidelines given by the Coconut Research Institute based on the decline of the nut production.

Cinnamon is not managed under clear cut system and the multiple shoot harvesting is done in accordance with the guidelines made by the Cinnamon Research Institute and Department of Export Agriculture.

Guidelines published by the Sri Lanka Forest Department are used for managing the timber species. These are also based on research and many years of practical experience.

All timber blocks present in Sub-FMUs are managed under clear felling system. However, a large number of trees of timber value are grown in scatter manner in all Sub-FMUs and those species are harvested under selection felling system based on two exploitable (harvestable) girth sizes, i.e., 125 cm and 150 cm. In addition, irrespective of the size, all other trees growing inside rubber fields are uprooted when the rubber trees are uprooted to minimise the treat of spreading white root disease.

Timber volume estimation

The following volume equation is used for timber volume calculation for individual trees.

$$volume = \frac{(\pi \times dbh^2)}{40000} \times height \times form\ factor$$

Guidelines published by the Rubber Research Institute and Forest Department are also used for scheduling the timber harvests. Further details of timber block harvesting are given in the Forest Management Plan.

5.6 Forest land enrichment

LRAD identified the low diversity forests, caused due to previous erosion or excessive harvesting. Those are maintained to increase the natural regeneration and protection measures have been taken to enhance the enrichment. In addition, LRAD maintains the deadwood retaining policy, which is to retain 1 m^3 of deadwood per hectare after clear felling of commercial plantations. However, as per with the strong recommendations of the Rubber Research Institute, this policy is not implemented for rubber uprooting areas to prevent the spread of serious diseases such as white root and brown root.

5.7 Forest conversion

LRAD does not convert any natural forests to plantations. Usually forest plantations are maintained throughout using the timber of fuelwood species. In any case, if there is an urgent need for the conversion, still, LRAD assures that no HCVF will be used for this purpose.

CHAPTER 06: FOREST PRODUCTS HARVESTING

FMUs of LRAD mainly provide NTFPs and timber harvesting is done only at the decline or at the end of producing NTFPs. However, the management of LRAD is fully aware of the potential environmental damage that can be caused at the tree harvesting periods. Therefore the information mentioned in the following sections is used by the LRAD management in timber harvesting. Those methods have been developed with the national best practice guidelines published by the relevant authorities. In addition, guidelines published by the Rubber Research Institute, Coconut Research Institute and Export Development Board are followed in NTFP harvesting. Furthermore, NTFP harvests have been planned not to exceed the estimated replenishment rates at long-term basis.

6.1 Products harvested in LRAD Sub-FMUs

Those products can be divided as non-timber and timber products. Details of those products are given in Table 2 of Section 5.4.

6.2 Harvesting selection

LRAD does not permit to clear cut or tree harvesting in sensitive areas, such as buffer zones, land slide vulnerable areas (if any) ,wetlands and other sensitive areas such as frequently used by the public.

LRAD maintains different crop types as mentioned in the Table 2 of Section 5.4, mainly for obtaining NTFPs. Coconut harvesting is done by the experienced coconut prickers using bamboo stems. All seed and nut harvesting methods are done following the guidelines published by relevant authorities and therefore it does not affect the plant growth.

i. Rubber

Majority of the extents of LRAD is consist of Rubber. Replanting cycle of rubber is generally 30 years. Rubber tapping is a commercial operation conducted on sustainable yield basis and a set standard of tapping is in place. Latex of rubber plants are extracted as per with the guidelines of the Rubber Research Institute (Handbook of Rubber Volume I: Agronomy) and Agricultural policy guidelines of the company (Lalan Rubber Agri Policy Manual, 3rd Edition 2015). According to those guidelines, tapping starts for the first time once 70% of the trees reach 50 cm girth at 120 cm above the ground. In a clearing that has already reached tappability, tapping is conducted in trees having a girth of 40 cm or more if clearing is more than seven years old. Advisory Circular No. 6 of the Lalan Agri Policy 2015 describes the tapping systems that will be adopted during the tapping cycle of a rubber tree.

ii. Tea

The tea harvesting is undertaken by skilled tea pluckers. Both hand plucking and sheer plucking practices are adopted. Infilling and replanting are practiced in rejuvenating the asset. The extent under tea is marginal. Please refer Lalan Tea Agri Policy Manual, 1st Edition 2015 for more details.

iii. Coconut

Seedlings (old cultivation) and TSR/ T x T clones has been planted in the coconut blocks of LRAD Sub-FMUs. This clone starts producing nuts after the 5 – 6 years after planting. Nuts are pricked by contract workers using bamboo stems at 45 days intervals. The lifespan of a coconut tree is 60 years 45-60 nuts are produced in one tree per year.

iv. Cinnamon

Cinnamon harvesting is done by using selected shoots leaving at least three stems on the ground after three years of planting. Since then the stem collection procedure is conducted at six to eight month intervals. A cinnamon plantation can be managed about 50 years. Cinnamon peeling is done by the skilled contractors. 250 g of dry cinnamon can be processed using 1 kg or raw cinnamon with the conversion ratio of 25%.

v. Oil palm

LRAD is in the process of diversifying its marginal Rubber land into Oil Palm. Oil palm nut harvesting starts from the third year after planting. Selected ripened bunches are cut using a long handled sharp knife at ten-day intervals by the trained FMU workers. The economical lifespan of an oil palm tree is about 25 – 30 years.

vii. Timber

The details of the timber blocks managed by LRAD manages are given in the FMP prepared for the period of 2018-2022.

Approval for the FMP is obtained from the Sri Lanka Forest Department for every five year period. Annual harvesting amounts are approved by the Plantation Management and Monitoring Division of the Ministry of Plantation Industries with the suggestions of Central Environmental Authority and Sri Lanka Forest Department.

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6.3 Harvesting restrictions

Harvesting, even the NTFPs is not usually conducted for commercial purposes in the conservation areas and HCVFs. NTFP collection is allowed in the buffer zones and high slopes. However, tree uprooting is not conducted in the 10 m buffer zones of HCV areas and special machinery and extra care are required when timber harvesting is conducted stream buffers and in slopes higher than 45%. Further details are given in the LRAD Policy no. 08 and 18 and Guidelines in the FMP.

6.4 Tree harvesting planning

Since LRAD does not have adequate manpower or machinery, tree harvesting is mainly done by the contractors. Guidelines given in FSC Principals and Criteria are followed during the harvesting to minimise the environmental damage. Therefore contractors must also follow the given guidelines in the contractor agreements to minimise the damage to the trees, biodiversity, environment and workers. In addition, in order to identify the areas of protection and areas/ trees which need special attentions, a pre-harvesting assessment is conducted by the direct participation

of the Sub-FMU Manager/ Assistant Manager prior to the harvest. In order to identify the restoration of the harvested sites after replanting, a post-harvesting assessment is also conducted. The data are examined by the FMU Manager and/ or the FSC Coordinator to identify the impact mitigation. The harvesting works of the contractor is closely monitored under the direct supervision of the Sub-FMU Manager/ Assistant Manager. Further details of pre and post-harvesting assessments and monitoring are given in the Chapter 10 of the FMP. The following topics are also illustrated in detail in Chapter 10 of the FMP.

i. Tree harvesting and extraction methods
ii. Impact mitigation in harvesting
iii. Protection measures
iv. Transport of harvested products
v. Harvesting approvals

CHAPTER 07: FOREST PROTECTION

Forest protection is vital to ensure a healthy growth and safe working environment in managing forest plantations. Therefore with internal protection measures, LRAD continuously strive to work with the government, neighbouring community and own employees to protect the Sub-FMU premises, plantations and other resources from illegal activities and other potential damages.

7.1 Illegal activities

LRAD maintains Wildlife Policy and many other relevant policies to ensure the safety of the FMUs. Watchers are employed for protection of the Sub-FMU resources and they are aware of the potential illegal activities. Table 4 illustrates the results of an analysis conducted on the potential illegal activities and the responsibilities given to the suitable persons.

Table 4: Analysis of potential illegal activities of FMUs in LRAD.

Damage	**Property**	**Severity/ Risk**	**Prevention**	**Responsibility**
Theft	Sensitive area	Very Low	Watcher awareness	Watcher, Field Officer
Hunting, fishing, animal trapping and collection	Conservation and HCVF area	Very Low	Watcher visit, Field Officer visit, Assistant Manager visit, Awareness of Wildlife unit and Police of the region, Community awareness	Watcher, Field Officer, Assistant Manager, Manager
Illegal harvesting	Latex/scrap Coconut Cinnamon	Low	Watchers awareness, Community awareness	Watcher, Field Officer

Illegal timber felling	valuable trees in the estate	Low	Watcher awareness, Community awareness	Watcher, Field Officer
Encroachment	Estate premises	Low	Watcher awareness, Community awareness	Manager, Assistant Manager
Fire setting	Plantations, Sensitive areas, HCVFs	Low	Training, Watcher awareness, Community awareness	Watcher, Field Officer, Assistant Manager, Manager

In addition, letters have been sent informing Police, Department of Wildlife Conservation and Forest Department about the potential threats to the wildlife and relevant premises by the FMU Managers. There are Secret Informants present in each Sub-FMU to directly inform the suspicious activities to Sub-FMU Manager or Assistant Manager. Identities of the informants are not revealed any way and the information given by them are not recorded with their names.

Actions taken on illegal activities

i. Anybody who violates law or estate regulations will be brought to the notice of the Estate Management and bound to be charged in an appropriate manner.

ii. All such violations are recorded and kept at the Sub-FMU Office.

iii. Watchers are informed about their duties which were included in their duty list.

iv. Sub-FMU Management employs adequate amount of Watchers for guarding its premises.

v. Watchers maintain their regular field rounds on a daily basis and any special/ urgent matters should be immediately brought in to the notice of the Management.

vi. The Management should work closely with the Grama Niladhari, Police, Officers of Forest and Wildlife Departments to minimise the illegal activities in the Sub-FMU premises.

7.2 Other threats

Damages to the properties and plantations of the Sub-FMUs can also occur due to natural reasons or due to the forest operational activities. LRAD ensures the minimisation of such damages due to the various actions taken as described in the following sections.

i. Damages caused due to natural disasters

Table 5 describes the potential threats and damages of the natural disaster and the mitigatory actions taken by the LRAD management.

Table 5: Damages caused due to natural disasters and mitigatory actions.

Damage	**Property**	**Severity/ Risk**	**Prevention/ Mitigation**	**Responsibility**
Heavy rain, Flood	All crops, Lands, Infrastructures, Soil	Medium-High	Draining system, Soil conservation measures	Field Officer, Assistant Manager, Manager, Group Manger
Thunders and Lightning	Some crops (Coconut, Rubber), Buildings, Houses	High	Awareness regarding lightening and protection	Assistant Manager, Manager, Group Manger
Heavy winds	Crops and trees, Infrastructure, Buildings, Houses	Medium	Removal of damage causing trees to buildings and infrastructure	Field Officer, Manager, Group Manger

Land slide	Crops, Infrastructures	Low. High in some Sub-FMUs	Advice from NBRO or expert. Displacement of likely to affect workers	Manager, Group Manager

ii. Damages due to tree harvesting

Tree harvesting is most damage causing action in forest management. LRAD hires contractors for this reason and the potential damages caused due to their actions are mitigated as shown in Table 6.

Table 6: Mitigatory actions for the damages due to contractor's work in harvesting.

Damage	**Property**	**Severity/ Risk**	**Prevention/ Mitigation**	**Responsibility**
Contractor's machinery work	Soil, Sensitive area, Buffer zone, Water way, Wet land, Conservation area, HCVF	Low, Moderate or High	Contractors awareness, Field Officer inspection	Field Officer, Assistant Manager, Manager, Group Manager

iii. Biodiversity protection

LRAD already identified the important areas of biodiversity and habitats of Rare, Threatened and Endangered (RTE) species and effective protection measure have been taken by declaring them as conservation areas or HCVFs. Further details are available in Biodiversity Assessment Report and in Chapters 9 and 10 of this manual.

iv. Damages due to the use of chemicals

LRAD maintains an integrated pest-management (IPM) policy and uses an IPM program based on ecological principles for the control of harmful pests. Therefore it also gives priority to the use of

physical, mechanical, cultural and biological control methods, and the least possible use of agrochemicals.

In addition, LRAD never use genetically modified organisms (GMOs) in its Sub-FMUs for agriculture, forestry or any other purpose. Further it never has any intention to introduce the GMOs to the Sub-FMUs.

7.3 Use of local community and stakeholders in forest protection

LRAD encourages the participation of its workers, local community and other stakeholders for protection of the Sub-FMU resources. Their participation is encouraged and requested by increase the awareness as listed in Table 7. Minutes of those meetings and copies of the letters sent are maintained in the office of each Sub-FMU.

Table 7: Awareness of the participation of all stakeholders in forest protection.

Stakeholder	**Awareness method**	**Threat/ Reason**
Workers	Muster meetings	Protection of all estate resources including sensitive areas, Conservation areas and HCVFs, RTE species
Local community	Stakeholder meetings	Fire prevention, Protection of sensitive areas, HCVFs, RTE species
Police	Letter	Vulnerable estate premises, HCVFs
Department of Wildlife Conservation	Letter	Conservation areas, HCVFs, RTE species
Forest Department	Letter	Conservation areas, HCVFs, RTE species

7.4 Specific management actions

i. Protection of biodiversity and RTE species

The biological survey conducted by an expert has identified the biological values and the presence of RTE species and their habitats. LRAD ensures to protect them by using specific management actions with the participation of Sub-FMU workers and relevant stakeholders.

ii. Fire management plan

LRAD takes all precautions to avoid any causes for creating fire. All factories and stores are equipped with fire extinguishers. Fire belts are established in needy areas and fireguards are in place in certain areas. All contractors are aware of preventing fires and the machines are equipped with fire extinguishers. When own employees are used for fire protection purposes, they are properly trained via fire drills. The fire fighting committee comprises of the following members.

i. Manager or Assistant Manager in charge of the division
ii. Field Officer in charge of the division.
iii. Watchers of the division
vi. Selected workers

CHAPTER 08: ECONOMIC ASPECTS OF FOREST MANAGEMENT

The main economic goal of LRAD is to remain as a viable enterprise by generating revenue that is able to meet the full social, environmental and operational cost of its activities. In order to meet this goal, LRAD plans to meet the following conditions and carry out the under listed operations.

8.1 Efficient increase of field operations

An efficient use of the limited resources is required for healthy economic gains as listed below.

i. Improving the operational efficiency of the machinery by regularly servicing them and, replace obsolete ones based on sound economic criteria. Hiring contractors for certain works which LRAD is not able to complete itself is also in place.

ii. Motivating the staff to increase daily and long-term productivity per person-day.

8.2 Sustained yield principle

The long-term existence of LRAD depends on continued and sustained production of non-timber and timber products from the plantation resources. Therefore LRAD is committed to ensure sustained yield of non-timber and timber production from those resources without damaging them in the long-run.

8.3 Expand of market potential

Sri Lankan rubber primarily consists of two industries, viz. (i) the plantation industry, which harvests latex from rubber trees and converts it to processed raw rubber, and (ii) the rubber products manufacturing industry, which converts raw rubber into value added rubber goods. In

addition to this, a third sector is emerging, which is the use of rubber wood as a material resource for manufacturing a wide range of wood based value added products.

In accordance with the above, LRAD continuously plan to expand the local market potential while exploring the export market potential.

CHAPTER 09: ENVIRONMENT SAFEGUARD AND BIODIVERSITY PROTECTION

Table 2 of this document illustrates the forest products and services of the Sub-FMUs managed by LRAD. Among them, environmental and biodiversity services are prominent at local and national level because they help to protect the important species and landscapes. Moreover, LRAD manages its Sub-FMUs with the objectives of protection of the important and RTE species, habitats and conservation of forest resources and other land types in line with the regional landscape.

Management of LRAD is also aware that the forest operations may cause negative environment impacts and therefore all such activities are conducted in compliance with the relevant laws and FSC Principles and Criteria to safeguard the environment and to protect the important biodiversity.

9.1 Environment impacts assessments

Self-environment impact assessments are conducted in each Sub-FMU before and after the major operations, especially at tree harvesting. Pre and post-harvesting assessments are mandatory to conduct before and after the harvesting respectively under the direct supervision of the FMU Manager/ Assistant Manager to reveal the negative impacts and to identify the mitigatory measures.

Apart from pre and post-harvesting assessments which are described in FMP and Section 6.4 of this manual, LRAD conducts different other assessments during management of FMUs as shown below. The findings of those assessments are analysed recorded and used in the next planning to improve the forest management activities.

i. Annual permanent sample plot measurements
ii. Ecology and biodiversity assessments
iii. HCVF assessments
iv. Invasive species monitoring
v. Social status

9.2 Environment impact mitigation

Environment impact mitigation actions are taken in accordance with the findings of the negative impacts from the environment assessments to ensure no significant impacts occur on the forests' services and resources. Water quality and soil erosion are measured to ensure that no negative impact arises during major forestry operations. If necessary, Vetiver, Lemon grass and Gliricidia species are used to stop erosion in the uprooting areas. Disturbances to the RTE species and their habitats are avoided and soil compactness at tree harvesting period is continuously monitored to keep it at minimum level. Table 8 illustrates some of the findings of different assessments and the mitigatory measures taken.

Table 8: Examples of negative impacts found after different environment assessments.

Issue	Areas	Mitigation	Responsibility
Soil erosion	All uprooting areas	1. Follow LRAD policy guidelines 2. Increase cover crop 3. Proper road construction 4. Prevent heavy machinery use in high slopes	Field Officer Manager Group Manager
Accumulation of tree residues	All uprooting areas	1. Follow LRAD policy guidelines 2. Buffer zone establishment preventing dumping of residues	Field Officer Manager Group Manager
Invasive species	All estates	1. Remove gradually	Field Officer

9.3 Biological diversity

A detailed study has been conducted in 2016 to identify the status of biological diversity, presence of RTE species, conservation areas and HCVFs in LRAD FMUs. That survey also identified the key ecological indicators for the purpose of monitoring the biodiversity status at regular intervals. RTE species were identified in accordance with the IUCN red data book published in 2012.

Trainings are also given to the staff and workers to identify the important species present in the Sub-FMUs. Findings are incorporated into the management plans. Details of these assessments are available in the Biological Assessment Report. A format to be used for the summary of the biological assessment conducted in 2016 is given in Table 9 which is available in the Biodiversity Assessment Report 2016.

Table 9: RTE, indicator and key stone species identified in the Flora and fauna assessment report conducted in 2016.

Estate	Threatened	Endangered

* Please refer the Flora and fauna assessment report (2016) for the details of this table.

All workers, watchers and field officers have been instructed to immediately report the sighting of any important animal present in Sub-FMUs of LRAD. That information along with the name of the animal and the location are maintained in "Monitoring of Conservation Areas" at the office of each Sub-FMUs.

9.4 Buffer zones and wildlife corridors

Buffer zones are maintained to protect the sensitive areas, especially water courses from erosion, pollution and other damages. Buffer zones are established on the ground using live plant species such as Bamboo, Kumbuk, Dan, Domba, Mee etc. at regular distances or using paint on existing tree stems and those are also marked on the maps. Any environmentally harmful activity such as road construction, operation of heavy machinery, waste disposal, chemical use, uproot of large trees etc. are prohibited in the buffer zones. The environment quality of the buffer zones will be further improved by planting suitable native species whenever possible. Field Officers,

Supervisors, Workers and Contractors should be thoroughly aware of the buffer zones and the activities that are banned in those areas.

Buffer zones are established with the distance of 10 m from the boarder of the HCV, if any other regulation is not present on the same matter. The following actions are prohibited in the buffer zones. Further details are available in the Sensitive Sites Policy.

i. Agrochemical use
ii. Large tree up-root (HCV buffer zones)
iii. Heavy machinery operations
iv. Waste disposal
v. Construction
vi. Soil damage/ loosening
vii. Burning
viii. Any other harmful activity identified by the FMU Management
ix. Construction of new roads

Wildlife corridors are established in LRAD Sub-FMUs if the ecological and biodiversity survey or pre-harvesting assessment identifies the need of the same.

9.5 Control of invasive species

Most of the species grown in LRAD FMUs are exotic. However, their use is recommended by the relevant authorities and those species are well-adopted to the regional landscapes without showing invasiveness. Further details regarding this have been given in Section 5.2 of this manual.

However, a few invasive plant species are present in the Sub-FMUs which have been spread from the surrounding lands. *Alstonia macrophylla* (hawari nuga/ ginikuru/ yakada maran) and *Dillenia suffruticosa* (diyapara) are the main invasive species identified in the LRAD lands. Those are

controlled and monitored by the field staff under the supervision of the executive species. FMU Management will strictly control the regeneration and spread of the invasive species by using a well-structured approach. Such species are already established in the conservation areas and other areas in large scale are not eradicated due to the impossibility, especially due to the restrictions in using agro-chemicals, fire, large scale machinery and the due to the prevailing legal systems. However, further spread of those species in such areas will strictly be controlled. In addition all Sub-FMUs workers have been given instructions to uproot/ remove the invasive species at young stage once such species are encountered. Invasive species control records are analysed by the Sub-FMUs Manager/ Assistant Manager/ Forestry Officer/ FSC Coordinator and kept in the Group Office or Sub-FMU Office to incorporate in the next year plan.

Guidelines for Controlling Invasive Species

- All workers should be trained to identify the invasive species.
- Eradication of small plants of invasive species in all Sub-FMUs should be done at regular intervals.

9.6 Sensitive sites/ locations

Sensitive sites can be located inside the FMUs in small, medium or large scale. The potential sensitive sites are given below.

i. Waterways and natural springs
ii. Important habitats
iii. Important trees (religious, cultural, social, service)
iv. Caves
v. Corridors
vi. Marshes
vii. High slopes
viii. Landslide prone areas

Those areas are identified, mapped (whenever possible), recorded and awareness is given to the field offices, watchers and workers. If possible, the villagers are also informed.

9.7 Conservation areas

The management of the LRAD Sub-FMUs are based on prioritising the environmental preservation and to be in line with the landscape of the area. Therefore the FMU maintains conservation areas of over 5% of the total extent. Conservation areas have been identified to be samples of existing natural ecosystems of the region. Those are managed so as to retain and/ or restore their natural states. Those conservation areas are given in Table 10 which have been marked on the ground and in maps of the Sub-FMUs. Sign boards are established to demarcate those areas and officers of the Department of Wildlife Conservation and Forest Department have been informed about the presence of those important areas. The community and the workers have also been informed at stakeholder meetings and muster meetings respectively.

Table 10: Presence of conservation areas in LRAD Sub-FMUs.

Group	Estate	Total extent, ha	Conservation extent, ha
Mahaoya	Densworth	331.85	39.32
	Mahaoya	706.58	142.61
	Woodend	967.57	29.18
Miyanawita	Dabar	389.40	0.00
	Miyanawita	583.11	223.35
Sapumalkande	Illuktenna	381.87	13.44
	Reucastle	858.94	31.22
	Sapumalkande	801.99	5.00
Udabage	Eila	468.50	8.17
	Udabage	796.75	2.12
	Udapola	720.00	32.41
Pitiyakande	Keppitigala	317.63	50.09
	Moretenna	383.45	13.18
	Muwankande	592.50	49.09
	Pitiyakande	433.62	7.00

9.8 Specific management actions for the conservation/ important areas

The areas managed for non-commercial benefits such as ecologically and biodiversity important areas, sensitive areas etc. require special management actions. Therefore LRAD uses different approaches to manage those areas to increase the supply of services to increase the conservation status.

i. Protection of biodiversity or ecologically important areas

Community awareness is important for this activity including the protection of RTE species. As discussed in Chapter 7 of this manual, awareness has been increased among the community and workers and relevant authorities have been informed. In addition, Watchers have been asked to make frequent visits which are monitored by the Sub-FMU managers.

ii. Enhancement of natural regeneration

Natural regeneration and succession is encouraged in non-plantations and conservation areas of Sub-FMUs of LRAD. Further, LRAD does not convert any natural forests to plantations.

iii. Restoration of degraded sites

Restoration of degraded sites is promoted in LRAD Sub-FMUs, especially if such lands have been demarcated as conservation areas. Invasive species are controlled and the growth of native species and the presence of animals and birds are monitored at regular intervals to identify the positive impacts toward being a natural forest.

vi. Road, bridge and culvert construction and maintenance

Proper roads, bridges and culverts are essential in sound forest management. However, as much as possible, the existing roads are used for the transport purposes. Up on necessary, LRAD designs roads, skid trails and landing points minimising soil disturbances and protecting streams and waterways. Roads are first designed on the existing maps with minimum disturbances to the physical environment and important habitats and along minimum slopes and then the field construction is done.

CHAPTER 10: HIGH CONSERVATION VALUE FORESTS

LRAD identifies the high conservation value forests (HCVFs) based on the "High Conservation Value Forest Toolkit" published by HCV Network in 2003. Values of those forests are decided by experts in ecology and biodiversity and stakeholders. Once identified, those will be demarcated on the maps and the workers, villagers and other stakeholders are informed. If necessary, special security plans are implemented in those areas. Monitoring is regularly done as mentioned in the previous sections. Records are maintained in the estate office. The HCVFs of LRAD FMUs are given in the HCV assessment report.

Table 11: HCVFs identified in LRAD FMUs.

Estate	Division	Field	Extent, ha	Value

* Please refer the HCV assessment report for the details of this table.

10.1 Increase of worker and community awareness

Awareness of the workers and surrounding community about the importance of HCVFs are increased via muster meetings and stakeholder meetings respectively. At regular intervals, an expert of ecology and biodiversity is employed to conduct awareness programs about the HCVFs to the FMU staff and selected persons from the community.

10.2 Management and protection of HCVFs

LRAD manages its HCVFs by promoting natural regeneration and strictly controlling the spread of invasive species. Those are surrounded by fence posts and gates if possible. Sign posts are used to indicate the presence of HCVFs. Officers of the Police, Department of Wildlife Conservation

and Forest Department have been informed about the presence of HCVFs and the importance and requesting to take actions to protect those areas further. Watcher patrol has been increased and Sub-FMU Manager and Assistant Manager also frequently visit the HCVFs to identify the threats.

The ecological and biological values are monitored by an expert at regular intervals and those records are used in next year planning.

CHAPTER 11: STAFF, WORKERS, CONTRACTORS AND TRAININGS

Staff and contractors of LRAD Sub-FMUs are made aware of the law, FSC requirements and safety measures to be taken in conducting certain activities at regular meetings conducted by the Sub-FMU Managers/ Assistant Managers or Group Manager. In addition, the commitment of LRAD to be with the compliance with the FSC Principles and Criteria are emphasised in those meetings in simple language.

Further, the management of LRAD understands the importance of labour and trade unions. Therefore all employees are free to join them and we are open for discussion with them. LRAD is also aware of the ILO conventions 87 and 98.

11.1 Meetings conducted with the workers

Meetings with the workers of the Sub-FMUs are conducted frequently. Every working day morning, Manager or Assistant Manager conduct muster meetings where the estate decisions related to the forestry operations are conveyed to them. Their views on such matters are also taken at the same meetings.

Meetings between estate management and worker unions are also conducted on the requirements of either the estate management or the union leaders. Such meetings are held by the estate management to convey the management decisions and changes to the workers via union leaders and to obtain the collective ides. Union leaders also request the meetings to discuss their rights and requirements with the estate management. Minutes of those meetings are available in each Sub-FMU office. Their important suggestions are implemented in future management plans of LRAD Sub-FMUs. In addition, relationships with the workers are well-maintained.

11.2 Worker/ community member suggestions recording procedure

The suggestions, grievances and complaints of the Sub-FMU workers to community members can directly be discussed with the Sub-FMU Manager under the open-door policy of LRAD. Those matters are recorded in the labour diary for taking further actions.

11.3 Handling grievances and resolution of disputes

The matters arisen in the Union meetings or personal complaints such as disputes and grievances are handled by LRAD FMU management with efforts on good faith using an accepted mechanism which is described in the following sections. Those disputes may occur due to one of the following reasons.

i. Dispute in the workplace with either a supervising officer or a co-worker
ii. Difficulty in obtaining proper living or sanitary conditions
iii. Disparity in wages earned against work done
iv. Problems in working conditions
v. Educational difficulties for children
vi. Transport facilities for sick or injured persons
vii. Disputes with a neighboring villager
viii. Insubordination
ix. Assaulting or abusing a staff member or co-worker
x. Theft or willful damage to estate property

Those disputes are resolved using the following procedure.

i. In the first instance, the aggrieved worker/ employee complains to his/ her immediate supervisor (Front Line Supervisor/ Field Officer) who makes a note of the matter and attempts to solve it. If he is unable to do so, the written complaint is forwarded to the

Assistant Manager/ Manager/ Group Manager of Sub-FMUs who is the in charge of that particular division via the Labour Diary.

ii. If this could be solved by the particular person, the matter ends there as with the most cases. Usually a domestic inquiry is held and after the matter is clarified a decision is taken.

If it is an employment related matter, the worker could complain to the Assistant Commissioner of Labour who will then summon the Management for a discussion and attempt to solve it. In the event this fails, the worker could go to the Labour Tribunal for a relief.

If it is a matter concerning a legal issue, it is referred to the Police Station requesting their assistance. Failure to do so at that level, a court action can be taken. In such circumstances, the actions are recorded in the Complaint Book of the office of each Sub-FMU of LRAD. Actions taken at each step is recorded in the Complaint Book and the final outcome is also recorded. Then the final outcome of the disputes, grievance or complaint is passed to the person/s who raised the particular matter and it is also recorded in the Complain Book of the office.

CHAPTER 12: HEALTH AND SAFETY

LRAD maintains a health and safety policy to ensure the safe working conditions for the workers in the Sub-FMUs. First aid boxes and fire extinguishers are maintained at office and factory premises of each Sub-FMU of LRAD. The management believes the following as their duties to protect the workers of the Sub-FMUs.

i. Provide and maintain a safe workplace which uses safe machinery and equipment

ii. Prevent risks from use of any article or substance and from exposure to physical agents, noise and vibration

iii. Prevent any improper conduct or behaviour likely to put the safety, health and welfare of employees at risk

iv. Provide instruction and training to employees on health and safety

v. Provide protective clothing and equipment to employees, whenever necessary

vi. Appointing a competent person as the Sub-FMU Safety Officer, most probably the Estate Medical Assistant.

Further, the management also believes that the workers should be able to work in compliance with the company's health and safety policy with the following matters.

i. To take reasonable care to protect the health and safety of themselves and of other people in the workplace

ii. Not to engage in improper behaviour that will endanger themselves or others

iii. Not to be under the influence of alcohol or drugs in the workplace

iv. To undergo reasonable medical or other assessment if requested to do so by the employer

v. To report any defects in the place of work, machinery or equipment which might be a danger to health and safety

12.1 Actions taken to minimise health and safety risks

Workers are made aware of the health and safety procedures at the muster meetings by the Sub-FMU Manager. Those minutes are recorded and kept at the office of each Sub-FMU. In addition, an Emergency Action Plan is displayed at the offices and factories of each Sub-FMU so that the workers can be aware of the actions to be taken at an emergency situation. During the health and safety evaluations, the information given in Table 12 were identified and the precautionary measures were taken to protect the workers from the accidents.

Table 12: Precautions taken to minimise the health and safety risks of the LRAD workers.

No	Risks	Severity	Control Measures	Responsibility
1	Slippery places along the ascending/ descending ways of tappers to rubber field	Moderate	Train tappers to use identified safe routs Proper maintain of foot path	Field Officer, EMP, EMA, Manager
2	Crossing water streams after heavy rain	Low	Increase of awareness	Field Officer
3	Serpent attacks (Occasional)	Low; High if happens	Increase of awareness, Training, Emergency action plan Vehicles made available	Field officer, EMP, EMA, Manager

			First aid	
4	Insect attack	Low	Increase of awareness Worker awareness	Field Officer, EMP, EMA, Manager
5	Chemical poisoning	Low	Use of PPEs Use of experienced, skilled, trained workers for chemical spraying Availability of first aid items	Field Officer, EMP, EMA, Manager
6	Falling with the chemical tank	High	Use of PPEs Use of experienced, skilled, trained workers for chemical spraying Availability of first aid items	Field officer, EMP, EMA, Manager
7	Cuts by tapping/ ordinary knife	Low	Tapping by skilled people Availability of first aid items	Field Officer
8	Tapping close to steep banks	Low	Tapping by skilled people Availability of first aid items	Field Officer, EMP, EMA
9	Wounds caused by tools	Low	Use of skilled people Availability of first aid items	Field Officer
10	Vehicle accidents	Low-High	Use of skilled and safe drivers Well-maintained vehicles	Driver, EMP, EMA, Manager
11	Machines with sharp edges, blades, moving parts	High	Use of protection guards for the sharp moving parts Use of PPEs	Field/ Factory Officer, EMP, EMA, Manager

12	Accidents caused by electricity	Low-Moderate	Well maintained electrical system regular checking by an Electrical Engineer Insulation of exposed wires Application of an inter-locking system when electrical maintenance is done.	Field Officer, EMP, EMA, Manager
14	Fire	Low	Fire fighter training Availability of fire extinguishers Fire alarm system Fire risk assessment	Field Officer, Manager
15	Circular saw/chain saw	Low	Use of protection guards for the sharp moving parts Use of PPEs	Field Officer, EMP, EMA

12.2 Maintenance of accident records

All accident occurred in the field, factory and office are regularly recorded in "Accident Record Book". The casualties are admitted to the nearest hospital, if necessary for medical treatment. For an emergency situation, vehicles are available at any time.

12.3 First aid and training

First aid training programs are held at regular intervals by experts for the workers, staff and managers to be aware of actions to mitigate occupational health problems in daily working environment. In addition, the Estate Medical Officer and Health Department of the area supports additional training. More information in this regard is given in Section 16.1.

CHAPTER 13: STAKEHOLDER PARTICIPATION IN FOREST MANAGEMENT

LRAD respects the rights and views of workers and stakeholders and therefore whenever possible stakeholder participation is used in management planning for the Sub-FMUs. The views and ideas of stakeholders are taken at stakeholder meetings conducted by the estate management. Especially the social, religious and cultural value areas located inside the Sub-FMUs are identified though the stakeholders. Stakeholder participation is also expected in protection activities especially related to the environmental concerns. Minutes of those meetings are available in each Sub-FMU office.

13.1 Recognition of user rights within FMU and forest management

Typical indigenous people known as "Vedda People" do not live within or in the region of LRAD Sub-FMUs are located. Therefore the management of LRAD considers the local community as the indigenous people and their rights are accepted and respected. Forest management procedures are implemented in accordance with the guidelines given by the relevant institutes such as Rubber Research Institute, Coconut Research Institute, Forest Department, Department of Export Agriculture and therefore the knowledge of the local community is not used in commercial forest plantation management. However, their knowledge is utilised in identifying the high conservation values and for the management of non-commercial lands. The following rights are given to the local community.

i. To use access roads
ii. To identify the conservation/ high conservation values of the lands managed by LRAD
iii. To use water
iv. To collect fuelwood
v. To collect medicinal plants, leafy vegetables (greens) and staples
vi. To conduct religious and cultural activities
vii. To use schools, cemetery, play grounds, child development centre etc.

13.2 Actions to identify the areas of user rights

The following actions have been taken to identify and demarcate the areas of the user rights within Sub-FMUs. Further, no commercial activities are conducted within those lands by the LRAD.

i. Mapping (roads, cemeteries, play grounds etc.)
ii. Sign posts (play grounds, creameries etc.)
iii. Stakeholder meeting and awareness

CHAPTER 14: SOCIAL BENEFITS

The management of LRAD is aware of the fact that the forest management should provide benefits not only to the staff and workers, but also to the society or the local community. All Sub-FMUs of LRAD provides employment opportunities, contractor opportunities, houses etc. to the workers and villagers. In addition, LRAD has taken actions to provide benefits to the society as listed in Table 13.

Table 13: Benefits provided to the society.

Group	Estate	Division	Benefits/ services provided
Mahaoya	Densworth	Densworth	Conservation forest area HCV – Pattini Amma Gala Children Development Centre Fuelwood collection area Cemetery 2 new housing schemes Kovil
	Mahaoya	Mahaoya	3 Kovils Water catchment area/ tube well 3 play grounds Medical Centre Cemetery Gotukola harvesting Fuelwood collection area New housing scheme
		Ernan	2 Kovils Children Development Centre Fuel wood collection area Cemetery Play ground Conservation forest area
		Glassel	Temple Water catchment area Fuelwood collection area
	Woodend	Woodend	Fuelwood collection area Children Development Centre

			Donating coconuts for Panawala Temple festival Play ground
		Yogama	Water catchment area Water supply to village and estate residents HCV – Vihara Gala Children Development Centre Fuelwood collection area Kovil
		Udayogama	Fuelwood collection area
		Rangegama	Water catchment area Play ground Children development centre Fuel wood collection area
		Talapitiya	Provide new housing scheme for estate workers Fuelwood collection area
		Nugahena	HCVF Donating coconuts for Nugahena Temple and Kovil Fuelwood collection area Kithul tapping
Miyanawita	Dabar	Dabar	Kovil Well and drinking water supply Cemetery Play ground
		Keerihena	Kovil Drinking water Cemetery Play ground
		Panakura	Kovil Well and drinking water Cemetery Play ground
	Miyanawita	Western	Well and drinking water Dispensary

			Kovil Workers Housing Co-operative Society Cemetery Play ground
		Eastern	Kovil Drinking water Child Development Centre Play ground Cemetery Temple
		Kosgahakande	Child Development Centre Kovil Well and drinking water Conservation area Cemetery
		Asamanakande	Kovil Well and drinking water Child Development Centre Church Cemetery
Sapumalkande	Sapumalkande	Sap Upper	Conservation area Gotukola harvesting Kovil Fuelwood collection area Cemetery
		Walpola	Drinking water Cemetery Fuelwood collection area School Kovil Play ground
		Clunes Lower	Fuelwood collection area Drinking water Gotukola harvesting School Kovil
		Clunes Upper	Drinking water Fuelwood collection area Gotukola harvesting

		Galahitikande	Conservation area Drinking water Fuelwood collection Hospital Cemetery
	Illuktenna	Illuktenna	Conservation forest Fuelwood collection area Cemetery Drinking water Play ground Child Development Centre Kovil
		Udahenkande	Gotukola harvesting Fuelwood collection area Cemetery Drinking water Temple School
	Reucastle	Digala Lower	Conservation area Gotukola harvesting Fuelwood collection area Cemetery Drinking water Play ground Child Development Centre
		Digala Upper	Conservation area Gotukola harvesting Fuelwood collection area Cemetery Drinking water Child Development Centre
		Deloluwa	School Temple Fuelwood collection area Cemetery Child Development Centre
		Reucastle	Conservation area Gotukola harvesting Fuelwood Cemetery

			Drinking water Play ground School
		Nahelma	High Conservation Area Well and water tank Kovil Fuelwood Child Development Centre Medicinal plant collection area Conservation area
Udabage	Eila	Eila	Drinking water Bathing places Play ground Fuelwood
		Malhasna	Drinking water Conservation area Fuelwood Temple
		Avington	Drinking water Temple Play ground Fuelwood
	Udabage	Upper	Drinking water Conservation area Fuelwood Roads
		Lower	Drinking water Play ground Bathing places Cemetery Fuelwood
		Middle	Drinking water Cemetery Play ground Three-wheel parking area Pre-school facility for village children Land allocated for a school Fuelwood
		Riverside	Drinking water

			Fuelwood Play ground Roads
	Udapola	Udapola	Drinking water Cemetery Bathing places Land allocated for School Land allocated for village expansion Land allocated for a power station Fuelwood
		Yatapola	Drinking water Play ground Fuelwood
		Manikkande	Drinking water Water scheme for villages Volley ball court Fuelwood School
		Mawatenne	Drinking water Conservation area Play ground Fuelwood

Pitiyakande	Pitiyakande	Pitiyakande	Gotukola harvesting Conservation area Supply of water bowser Giving Coconuts and husks Supply of tents, sound system and cooking utensils for village functions Fuelwood Cemetery area Play ground Giving sport items Supply of slasher machine with tractor Supply of grass cutter machine Supply of workers to police station, temple and school for cleaning of the premises Kovil Child Development Center Medicinal plants collection Dispensary Well and tank Estate worker housing cooperative society Supply of rain coats Training facilities
		Bridstowe	Gotukola harvesting Conservation area Supply of water bowser Giving coconut husks Giving coconut Giving tents, sound system and cooking items for village functions Fuelwood Cemetery Kovil Medicinal plants collection Water well and tank Supply of rain coats
		Pilessa	Gotukola harvesting Conservation area Supply of water bowser Giving coconut husks Giving coconuts Giving tents, sound system and cooking items for village functions Fuelwood Supply of rain coats

			Cemetery area Supply of grass cutter machine Medicinal plants collections Water well and tank Kovil
	Muwankande	Muwankande Upper	Gotukola harvesting High Conservation Area Supply of water bowser Giving coconut husks Giving coconuts Supply of tents, sound system and cooking items for village functions Fuelwood Estate Worker Housing Cooperative Society Supply of rain coats Cemetery Giving sport items Supply of slasher machine with tractor Supply of grass cutter machine Supply of workers to police station, temple and school to clean premises Child Development Center Medicinal plants collections Dispensary Water well and tank Training facilities
		Muwankande Lower	Gotukola harvesting Supply of rain coats Supply of water bowser Giving coconut husks Giving coconuts Giving tents, sound system and cooking items For village functions Fuel wood Cemetery Playground Giving sport items Grass cutter machine Medicinal plants collections Kovil Water well and tank
			Gotukola harvesting Conservation area Supply of water bowser

		Moratenne	Giving coconut husks Kovil Supply of rain coats Giving coconuts Supply of tents, sound system and cooking items for village functions Fuelwood Cemetery Playground Giving sport items Child Development Center Medicinal plants collection Water well and tank
	Nottinghill	Nottinghill	Gotukola harvesting Conservation area Supply of water bowser Giving coconut husks Giving coconuts Supply of tents, sound system and cooking items for village functions Fuelwood Estate Worker Housing Cooperative Society Supply of rain coats Play ground Giving sport items Supply of slasher machine with tractor Supply of grass cutter machine Supply of workers to police station, temple and school to clean premises Child Development Center Medicinal plants collection Dispensary Water well and tank Training facilities Kovil
		Bayswater	Gotukola harvesting Conservation area Supply of water bowser Giving coconut husks Giving coconuts Supply of tents, sound system and cooking items for village functions Supply of rain coats Fuelwood Cemetery

			Play ground Medicinal plants collection Water well and tank
Pitiyakande		Dee Ella	Gotukola harvesting Conservation area Giving water bowser Giving husks Giving coconut Supply of tents, sound system and cooking items for village functions Fuel wood Supply of rain coats Cemetery Giving sport items Medicinal plants collection Water well and tank
	Keppetigala	Keppetigala	Gotukola harvesting Conservation area Supply of water bowser Giving coconuts Supply of tents, sound system and cooking items for village functions Fuelwood Cemetery Estate Worker Housing Cooperative Society Supply of rain coats Play ground Giving sport items Supply of slasher machine with tractor Supply of grass cutter machine Supply of workers to police station, temple and school to clean premises Child Development Center Medicinal plants collection Dispensary Water well and tank Training facilities Kovil
			Gotukola harvesting Conservation area Supply of water bowser Supply of rain coats Giving coconut husks

		Galagama	Giving coconuts Supply of tents, sound system and cooking items for village functions Fuelwood Cemetery Giving sport items Medicinal plants collection Water well and tank Kovil
		Marlabe	Gotukola harvesting Conservation area Supply of water bowser Giving Coconuts and husks Supply of tents, sound system and cooking items for village functions Fuelwood Supply of rain coats Cemetery area Giving sport items Medicinal plants collection Water well and tank Kovil

14.1 Identification of the benefit providing areas

In case of providing indirect services such as food, greens, medicinal plants etc., those areas have been identified and mapped. Forest management activities that may cause damages to those areas are not conducted to safeguard the long-term existence of those resources.

14.2 Monitoring of provision of benefits

Over-harvesting is not permitted for any of the resources in order to make sure the long-term existence of the important resources such as medicinal plants. In addition, harvesting or extraction for commercial purposes is also not permitted to make sure the benefits are shared by a large number of individuals.

Permission of the FMU management is required to use the resources located within the Sub-FMU. Harvesting, collection or extraction is then monitored by the Watcher to prevent the over-use of those resources.

14.3 Assessment of the contribution of the Sub-FMUs to the wellbeing of the society

A Social Impact Assessment (SIA) is annually conducted at each Sub-FMU in the stakeholder consultation identification of the contribution of the forest management activities to the wellbeing of the society is discussed. This also aims at identifying the negative impacts. Minutes are taken separately in each Sub-FMU in for future planning. Further information is given in Section 15.13 (Monitoring and Assessment) in this regard.

Social Impact Assessment using Questionnaire surveys is undertaken for every 5 years. Results of which is analysed using analytical tools and issues are addressed if there are any.

CHAPTER 15: MONITORING AND ASSESSMENT

LRAD takes many different approaches to monitor the impacts of its forest management activities on different characteristics such as tree growth, environment, biodiversity, society etc. Further it uses different methods of data collection and analysis to identify the positive and negative impacts because it is expected to have no significant negative impacts on the forest's services and resources. Data collection can be varied as continuous, annual or periodical (Table 14).

Table 14: Assessments of different parameters.

No	Assessment	Interval	Remarks
01	Tree growth	Annual	By permanent sample plots
02	NTFP harvesting	Continuous	By daily records
03	Pre-harvest	Before harvesting	By complete enumeration
04	Tree harvesting	During harvesting	
05	Post-harvest	After harvesting	By complete enumeration
06	Biodiversity	Periodical	By sample plots, Site surveillance
07	RTE species	Periodical	By sample plots, Site surveillance
08	Animal sighting	Continuous	Visual
09	HCVF	Periodical	By sample plots
10	Invasive species	Continuous	
11	Water quality/depth	During harvesting	
12	Rainfall	Daily	
13	Soil erosion	During harvesting	
14	Pest and disease	Continuous	By records
15	Agrochemical use	Continuous	
16	Environmental hazard	Continuous	By records
17	Health and safety	Continuous	
18	Social impact	Twice a year	By incidents
19	Accidents	Continuous	
20	Complaints	Continuous	
21	Suggestions	Continuous	

15.1 Tree dynamics of plantations, conservation areas and HCVFs

Tree growth in plantations, conservation areas and HCVFs are monitored by using permanent sample plots (PSPs) laid out in representative manner (Table 15).

LRAD conducts a comprehensive ecology and biodiversity survey with a reputed expert. The records are kept available in the Sub-FMU office and the monitoring is done by the FSC coordinator or Forestry Manager. Indicator and key stone species are identified after the survey and continuous monitoring is conducted. All stakeholders are informed about those values and protection measures are taken for such areas and locations which are also depicted in maps. Corridors and buffer zones are established whenever necessary.

LRAD identifies the HCVFs based on the "High Conservation Value Forest Toolkit" of HCV Network published in December 2003. The values of those forests are decided by Ecology experts and Stakeholders. Once identified, those will be demarcated on the maps and the workers, villagers and other stakeholders are informed.

Tables 16 and 17 illustrate the methods of obtaining tree census and number of permanent samples laid out in one Sub-FMU. All activities in Table 15 and 16 are coordinated by the FSC Coordinator and Sub-FMU Manager/ Assistant Manager. Growth analysis of the rubber and timber blocks is also conducted by above personnel. An ecology and biodiversity expert is hired to conduct the ecology and biodiversity survey and to analyse data.

Table 15: Method of obtaining tree census.

Species	**Methods**
Rubber	Age 1-6 years: Tree counts, girth
	Age above 6: Tree counts
Timber	1-5 years: Tree counts
	After 5 years: Tree counts, Girth at 5 year intervals

Coconut	Tree counts
Cinnamon	Bush counts
Oil Palm	Tree counts
Tea	Bush counts

Table 16: Number of permanent sample plots laid in each sub-FMU and characteristics measured.

Vegetation	**No of plots**	**Data collected**	**Responsibility**
Rubber	3 per estate	Girth, Height, other changes	Field Officer, Manager
Coconut	1*	Tree count, other changes	Field Officer, Manager
Tea	1*	Bush count, other changes	Field Officer, Manager
Cinnamon	1*	Tree count, other changes	Field Officer, Manager
Oil Palm	1*	Tree count, other changes	Field Officer, Manager
Timber	1*	Girth, Height, Other changes	Field Officer, Manager
Conservation area	1 per estate	Sp identification, Girth, Height, Habitats	Ecology/ Biology Expert, Field Officer, Manager
HCVF (if any)	1*	Sp identification, girth, height, habitat, animals present	Ecology/ Biology Expert, Stakeholders, Manager

* Depending on the availability

Data analysis

During the periodical biodiversity assessment, the data analysis is done by a selected expert in the field. The changing pattern of biodiversity is identified during data analysis using the indicator species and the future planning is made on those results.

15.2 NTFP and timber harvesting and product conversion

NTFPs are the main products of LRAD as described in early Chapters. Each Sub-FMU Office/ Group Office maintains the daily, seasonally or periodically collected data. Those data are used for the necessary analysis.

15.3 Pre and post-harvest assessment

Details are given in Chapter 10 of FMP.

15.4 Animal sighting

Workers are trained to identify rare animals and to inform the Field Officer once noticed. Then the name of the animal (if identified) or the descriptions and location of seen are recorded. This information will be used by the management for identifying the biodiversity change. Same information will be provided to the ecology/ biodiversity export in his next visit for a proper analysis.

15.5 Invasive species

Alstonia macrophylla (Hawari Nuga/ Ginikuru/ Yakada Maran) and *Dillenia suffruticosa* (Diyapara) are the main invasive species identified in the LRAD lands. All workers are trained to identify the invasive species. The spread of invasive species are identified visually by noticing the number of new plants. This is regularly done as per with the program implemented by LRAD Sub-FMUs to eradicate the invasive species. Further information in this regard is given in Section 9.5.

15.6 Water flow and water quality

Water flow speed is measured during the uprooting period by the Field Officer at two week intervals using a travel time of a small stick in water between two marked points. Water quality is measured periodically during the biodiversity assessment by a reputed institute in the country for

drinking water. Factory waste water quality is annually measured. In addition, turbidity is assessed visually during the uprooting period.

15.7 Rainfall

Daily rainfall values are measured using rain gauges at each Sub-FMU to identify the impacts of the rainfall values, especially on rubber tapping.

15.8 Soil erosivity

Soil erosivity is measured by a small pit in uprooting area using a calibrated pole at two-week intervals.

15.9 Pest and disease

LRAD uses an integrated pest-management (IPM) program for the control of harmful pests as per with the IPM Policy. It gives priority to the use of physical, mechanical and cultural control methods and the least possible use of agrochemicals. In addition, LRAD does not use weedicides for plantations. As part of the program, the LRAD collects and record the following information about pest infestations.

Infestation dates and duration
Area and location
Type of pest
Control mechanisms used
Damages caused and Mitigation
Estimated costs of damage and control by Root cause analysis

15.10 Agrochemical use

Agro-chemical application is minimum at all Sub-FMUs of LRAD. However, as a policy, LRAD does not use any chemical banned by Sri Lanka Pesticide Registrar General, WHO or FSC. In the case of use, LRAD will follow strict regulations on the justification of using particular chemical/s, use of appropriate safety gear by the handlers and sprayers. Further, LRAD supports the integrated pest management approaches. Chemical use records will be maintained at all times in the relevant offices. The following guidelines are recorded in LRAD FMUs on agrochemical use.

Guidelines for chemical use

i. A record book is maintained at each Sub-FMU Office/ Group Office and the records should include product name, location of the site treated and the date, reason of apply, name of the sprayer/s, amount applied etc.

ii. Hazardous chemical containers are not disposed inside Sub-FMU after the use and those are handed over to the collectors registered in Central Environmental Authority.

iii. In case of spillage, those are collected with sand and disposed (buried) in an isolated point without making any possibility to contaminate with water courses. These places are also marked on maps.

iv. Store Keepers, Handlers and Sprayers wear safety gear when work with the hazardous chemicals.

v. All users of chemicals are properly trained.

15.11 Environmental hazard

Data on Environmental hazards are collected at different management activities. Tree uprooting figures are collected by Field Officer, Factory Officer, Watcher, Assistant Manager or FSC Coordinator. The detailed procedure of environmental hazard assessment monitoring is given in Section 6.4. The responsibilities of environmental hazard mitigation are given in Table 8.

15.12 Accidents, health and safety

Data on accidents occurred in FMU workplaces are recorded by Field Officer or Factory Officer. Once an accident is occurred, the patient is taken to the Estate Medical Officer and Sub-FMU Manager or Assistant Manager is informed. Data are kept at the Sub-FMU Office/ Group Office. Further details on this matter are available in Section 12.1 of this manual and the identified hazardous areas and mitigation methods are illustrated in Table 12.

15.13 Social impact

Impacts of the forest management activities on the social conditions of the workers are monitored by using a well-structured questionnaire. A sampling scheme is used for this purpose based on the worker population and the extent of each Sub-FMU. Results of the social survey are analysed by the FSC Coordinator. The following objectives are expected to achieve by the social assessment.

i. Finding out the social impacts due to the plantation management activities on the workers of the company

ii. Finding out the social impact of the forest management activities on the villagers living closer to the FMUs

iii. Finding out the environmental impacts of the forest management

15.14 Use of monitoring and evaluation results

The monitoring records collected on the above areas are analysed at regular intervals by an expert, Forestry Manager, FSC Coordinator or by a nominee of each Sub-FMU. Significant results are incorporated into the next management/ annual plan to minimise the negative impacts and to enhance the positive impacts.

CHAPTER 16: TRAINING

LRAD considers trainings as essential activities in managing forests in effective manner. Therefore different training programs are held to increase the awareness, to train the relevant staff and workers and to build the skills. LRAD obtains the support from the experts in different fields for the trainings required to make sure the delivery of the program to be complete.

16.1 Different training programs conducted

i. Training of staff and workers on operations

New recruits of NTFP collection such as latex tapping are trained by well-experienced senior workers. All new recruits have to undergo a thorough training program under them. In addition, employment trainings are conducted by the officers of the relevant authorities such as Rubber Research Institute, Coconut Research Institute, Coconut Development Board, Department of Export Agriculture etc. Records of attendance, photographs, thanking letters and the copies of the certificates are maintained at relevant Sub-FMU offices for future use.

ii. First aid program

First aid training programs are held annually for the workers, staff and managers to mitigate occupational health hazards in daily working environment and to give them a training on first aid activities. The Estate Medical Officer and Health Department of the area supports this training programme.

iii. Contractor training for their work

Instructions are given to the contractors regarding their work, especially for the timber uprooting activities. Those are further monitored by the Field Officers under the direct supervision of the FMU Manager/ Assistant Manager or Group Manager.

iv. Fire control training

A representative of a reputed company conducts an annual fire drill for factory workers to train them to take the control measures if there is a fire outbreak.

v. Other trainings

In addition to the above trainings, the following trainings programs have been conducted to increase the awareness of the relevant parties of the Sub-FMUs by reputed experts.

Environmental safeguard
Health and safety
FSC awareness
Child development program

CHAPTER 17: PREPARATION OF MEDIUM AND SHORT TERM MANAGEMENT PLANS

Short-term, mainly annual activity plans are prepared based on the information available in the long-term management plan. Those annual plans include the prescriptions for the work to be done in the forthcoming 12 month period in the relevant Sub-FMUs of LRAD.

The revision of the existing plan is also conducted at regular intervals, mainly at five year intervals to incorporate the findings of different assessments conducted in the previous years to minimise the negative impacts of forest management activities and to enhance the positive impacts.

Forestry Manager, FSC Coordinator and FMU Managers are responsible for the preparation of annual plans and revision of the existing plans. However, LRAD strongly believe the need of the support of an expert in forest management in revision and preparation of new plans. In addition to the continuation of the revised previous management actions, the changes identified in the social impact analysis, conservation area and HCVF analysis are especially considered in the management plan revision.

17.1 Specific management plans

Specific management plans are required to manage non-commercial landuses such as HCVFs, Conservation areas etc. Information regarding those activities is described in Chapter 10.

17.2 Availability of the public summary

Public summary of FMP is made available at Offices and in the Company website to enhance the transparency of the company's forestry related activities. Further, that information is given to the stakeholders on their request. It includes general information, forest details and other important information.

CHAPTER 18: DIFFERENTIATION OF CERTIFIED AND NON CERTIFIED PRODUCTS

18.1 Chain of custody aspects

As a rule, FSC and non-FSC wood or NTFP flow are controlled and separated to avoid mixing. However, all produces of LRAD are FSC certified and therefore additional efforts to stop such mixing are not required.

18.2 Transport of wood to the sawmill/ customers

Third parties or contractors transport the logs as LRAD does not have adequate man-poser for this activity. Therefore it's mainly their responsibility to do in proper manner. However, if such contractors are hired, LRAD management makes sure to separately transport the FSC certified and not certified products, if there will be such cases in future using the following procedure.

i. All forms used for loading and transport should indicate a label stating certified and non-certified products.

ii. If a mixed load is put on a single vehicle, FSC certified products should be easily identifiable (e.g., making a mark in green colour). When mixed loads and storage in road site depots, these are clearly marked and separately stacked.

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