PLANTATION MANAGEMENT PLAN

Tamil Nadu Newsprint and Paper Ltd.

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Tamil Nadu Newsprint and Paper Ltd

Plantation Management Plan

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Validity of the Plan:

The Management plan will be followed for 15 years i.e., from 2021 to 2036

REVISION

This document will be reviewed at least every 5years based on the inputs obtained. Minor updates may occur in the annual revisions with revised versions posted on as follows:

Version	Issue No	Date
PLTN/MGMNT/1	01	01/10/16
PLTN/MGMNT/2	02	01/01/18
PLTN/MGMNT/3	03	25/06/19
PLTN/MGMNT/4	04	20/05/20
PLTN/MGMNT/5	05	01/06/21
PLTN/MGMNT/6	06	04/06/22
PLTN/MGMNT/7	07	20/04/23
PLTN/MGMNT/8	08	28/06/23

Changes made in the current revision to address the following principles:

- **Compliance with law – CITES, Dispute Resolution mechanism**
- **Workers Rights and Employment Conditions – ILO conventions**
- **Indigenous Peoples Rights**
- **Community Relations**
- **Benefit from Forest**
- **Management Planning**
- **Monitoring Indicators**
- **Implementation of Management Activities**

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EXECUTIVE SUMMARY

The scope of this Plantation Management Plan (plan) is restricted to pulp wood plantation managed by Tamil Nadu Newsprint and Paper Limited's under various plantation scheme operated in farmers, institutions, and Government land holdings. This Plan has been developed to meet requirements of the TNPL's pulpwood. In addition, this plan incorporates the requirements of Forest Stewardship Council®, **Forest Stewardship Standard for India : FSC-STD-IND-01-2022 EN** for Assessing Forest Management in India.

Biological Diversity

In accordance with the legislation and requirements of various Forest acts like Indian Forest Act-1927 & Indian Biodiversity Conservation Act-2002 this plan seeks to assist with the conservation of biodiversity measures carried in the pulp wood plantation from land preparation to post harvesting operations to protect and minimize the damage to biodiversity if any available.

Ecosystem Health and Vitality

Various factors, such as fire, weeds, pests and diseases would have finite impact on plantation and associated ecosystem health that would result in economic and environmental loss. To address the issue the plan adopted measures include determining appropriate fire risk and maintaining surveillance and recording systems to control significant threats by weeds, pests and disease.

Soil and Water

Qualities of soil and water definitely have impact on plantation health and productivity. On the other hand pulpwood plantations protect the soil from erosion and conserve the water resources. The present plan outlines requirements and procedures to monitor soil, water conservation and management.

Climate change and carbon cycles

Greenhouse effect and associated climate change is becoming important issue globally. Impacts of climate change are still a debatable subject and over picture of climate change impacts are not fully understood. However, the plan outlines measures to reduce the potential impact of climate change on plantations such, improved silivicultural practices to conserve the water to climate change associated drought and increase the green cover in the country to sequester the CO2.

Productive capacity

The Plan outlines management measures for sustainable production and harvesting to maintain the plantation productive capacity and area. Improved pulpwood productivity by development and introduction of site specific high productive clones, effective resource utilization, reduce impact of disturbances and improved silvicultural activities.
Socio-economic benefits

The effective implementation, maintenance and management of pulpwood plantation results social and economic benefits to society both directly and indirectly. For example, creation of employment opportunity to local communities wherever the plantation available. The other benefits include that other than value based are aesthetic values, environmental protection carbon sequestration, water conservation, prevention of soil erosion etc. The plan includes effective engagement of various stakeholders to sustain and improve socio-economic benefits of pulpwood plantation management.

Plan Implementation and Management

TNPL Committed to continuously improve plantation management to implement best practice. Plantation management plan includes measure, such as, training and the transfer of knowledge, adaptive management, stakeholder engagement, transparent implementation process and internal as well as external auditing. **TNPL will proportionate to scale, intensity and risk of management activities, proactively and transparently engage affected stakeholders in its management planning and monitoring processes, and will engage interested stakeholders on request. TNPL committed to ensuring compliance with relevant legislation and FSC standards related Corruption and Crime Commission, Anti-discrimination, avoidance of child labour and avoidance of illegal harvesting. TNPL is committed to follow all the applicable laws, ratified international conventions and obligatory code of practice in its operating areas. The various applicable laws , etc are given in Appendix-C.**

Duration of Management Plan

This Management plan will be followed for 15 years from 2021 onwards. Since scientific technologies and methodologies are fast improving, the midterm revision may also be done on annual basis. Also if any suggestion or improvement strategies given in the Assessment/Monitoring that will be incorporated in the management plan during annual revision as per Annex-E.

Assessment of potential High Conservation Values

An assessment and management of High Conservation Values (HCVs) in plantation area has been undertaken in accordance with Forest Management Standard: Forest Stewardship Council®, Forest Stewardship Standard for India : FSC-STD-IND-01-2022 EN for Assessing Forest Management in India. The plan includes the measure that suggested making sure that HCVs are not threatened by plantation management activities within plantation boundary.

HCV 1: Species diversity

This value is intended to include areas with extraordinary concentrations of species, including threatened or endangered species, endemics, unusual assemblages of ecological or taxonomic groups and extraordinary seasonal concentrations. The TNPL FMUs do not operate in any of the global biodiversity hotspot (as declared by Conservation International) and no threatened or endangered plants or animals reported in these areas. However, the grey slender loris habitat has been found in nearby TNPL Unit II Plantation areas that is documented and protected by TNPL. The IUCN Red List of Threatened Species puts them as

least concern, which means they are doing well. TNPL protecting the grey slender loris which are present in the TNPL Unit II Plantation areas through proper protective measures such as planting more habitat trees, avoiding disturbances of habitats and spreading awareness among local people.

HCV 2: Landscape-level ecosystems and mosaics

This part of the HCVF definition aims to identify those forests that contain viable populations of most if not all naturally occurring species. All of the TNPL FMUs are considered low intensity or impact plantations and do not comprise of HCV 2 because the FMUs are operated privately owned farm lands and degraded Government and institutional land and have no significance at the landscape level.

HCV 3: Ecosystems and habitats

Some ecosystems are naturally rare, where the climatic or geological conditions necessary for their development are limited in extent. The TNPL FMUs do not contains ecosystems that are rare. No HCV 3 values present within the TNPL FMUs such as includes old-growth forest or genetically distinct populations that are important for conservation.

HCV 4: Critical ecosystem services

All forests provide some services of nature, such as watershed protection, stream flow regulation or erosion control. These services should always be maintained under good management, a fact reflected in the requirements of most forest management standards. HCV 4 values related to basic ecosystem services like clean water, irrigation supply systems and support for threatened and priority aquatic species present adjust to plantation activity will be identified and recorded. The plantation management plan will ensure that the plantation activity do not have any significant impact on these entities.

HCV 5: Community needs

The definition of HCVFs recognises that some forests are essential to human well-being. This value is designed to protect the basic subsistence and security of local communities that are dependent on forests - not only for “forest-dwelling" communities, but also for any communities that get substantial and irreplaceable amounts of income, food or other benefits from the forest. HCV 5 is not considered to be present within the TNPL FMUs because no local communities are significantly dependent TNPL FMUs to meet their basic needs. However, TNPL engaging local people for its plantation activities and improving the livelihood of local people.

HCV 6: Cultural values

As well as being essential for subsistence and survival, forests can be critical to societies and communities for their cultural identity. This value is designed to protect the traditional culture of local communities where the trees are critical to their identity, thereby helping to maintain the cultural integrity of the community. Cultural heritage values present within in the TNPL FMUs particularly, worship sites, trees with religious importance are marked as HCV entities.

The plantation management plan will ensure that these sites are not disturbed due to plantation activity and efforts will be made to protect and monitor these HCV sites. Other HCV 6 values present if any in the TNPL FMUs like scientific, aesthetic and social values will also be identified and protected.

1.0. INTRODUCTION

Tamil Nadu Newsprint and Papers Limited (TNPL) was established by the Government of Tami Nadu during early eighties to produce Newsprint and Printing & Writing Paper using bagasse, a sugarcane residue, as primary raw material. The Company commenced production in the year 1984 with a initial capacity of 90,000 tonnes per annum (tpa). Over the years, the production capacity has been increased to 2,45,000 tpa and the Company has emerged as the largest bagasse based Paper Mill in the world consuming about one million tonnes of bagasse every year. In addition to that TNPL operate 300 TPD each hardwood and waste paper fibre line. The Company completed a Mill Expansion Plan during December 2010, with addition of Paper machine 3, to increase the mill capacity to 4,00,000 tpa. TNPL also developed Board plant at Mondipatti in line with MeP. TNPL exports about 1/5th of its production to more than 50 countries. Manufacturing of quality paper for the past two and half decades from bagasse is an index of the company's technological competence. A strong record in adopting minimum impact best process technology, responsible waste management, reduced pollution load and commitment to the corporate social responsibility make the company one of the most environmentally compliant and socially responsible paper mills in the world.

TNPL commissioned its lime sludge and fly ash management project to convert the inorganic waste generated from the mill into cement. Also a new green filed project with 2,00, 000 TPA capacity to manufacture multi layer paper board. TNPL is committed to sustainable use and management of the resources, such as fibre, fuel, water and other natural capitals throughout its operational boundaries.

The National Forest Policy of 1988 resolved to phase out the supply of raw material to wood based industries and ultimately to stop the raw material supply totally from the forest. The policy also indicated that wood based industries have to become self-reliance in meeting the raw material demand by establishing direct linkages with the farmers by providing lending facilitates and other input needs. To meet the raw material requirement and also to sub-serve the 1988 National Forest Policy Guidelines of Indian Government, TNPL has initiated plantation programme during 2004-05 and has accelerated the pace to increase the area under pulp wood plantations.

Under TNPL plantation schemes, TNPL motivating and facilitating the farmers particularly small and marginal farmers to raise high-tech industrial pulpwood plantations, which in turn provides financial assistance, technical advice and harvesting and transport services, as stipulated by the National Forest Policy 1988. TNPL developing pulpwood plantations in the land belonging to small and marginal farmers and institutional, temple and government lands.

Sustainable plantation management is the process of managing plantation with regard to the production of a continuous flow of desired plantation products and services without undue reduction in future productivity and undesirable effects on the physical and social environment.

In line with this policy, TNPL motivated the small and marginal farmers and institutional, temple and government lands to raise pulpwood plantations under Farm Forestry and Captive Plantation schemes.

Under Farm Forestry scheme, TNPL motivates individual small and marginal farmers and institutions to raise fast growing pulp wood plantations by supplying high quality clones at subsidized rates and providing technical assistance to raise and manage pulpwood plantations.

Under Captive Plantation Scheme, TNPL enters into a MoU with land owners for establishment of plantation in their land either on lease rental or on gross revenue sharing basis. The minimum land holding should be 25 acres and above. As per the MoU, TNPL make all the expenditures right from land development, planting, maintenance to harvesting.

These schemes are being implemented throughout Tamil Nadu through 4 zones and 11 regions of Tamil Nadu which providing advice and technical assistance to pulpwood plantations growers.

As on 31.03.2023, TNPL developed about 233774 acres of pulpwood plantations in its operational areas by involving 45738. Out of which, about 213251 acres are covered under Farm Forestry Plantations and 20523 acres under Captive Plantations scheme.

The plantation programme implemented by TNPL has the desired result in green cover and thus restore the ecological balance of the operational area. Implementing the tree farming activity outside the forest area will enable definitely converting the underutilized degraded lands into green cover. Further, by establishing pulpwood raw material outside the forest area, an equal amount to this area of natural forest is conserved without disturbance for pulpwood and firewood.

TNPL initially defined the scope of its FSC® certification to include both plantation management operated by the farmers directly (Farm Forestry) and plantation management operations managed by TNPL (Captive plantations) on private and
government land. Later TNPL has re-defined its scope to include only Captive plantations managed by TNPL. Based on the increased demand on FSC certified paper and Company's thrust on environment & society development, TNPL included Farmers plantations also under Scope of FSC® certification.

TNPL has developed numerous strong relationships with individual landowners, plantation estate owners, customers, other stakeholders, and government agencies. Our attention to detail, knowledge of industry developments and the timely completion of complex projects ensure we deliver professional and sustainable plantation management to improve the productivity and stakeholder value.

Pulp and paper industry basically has strong relationship with biology and biotechnology, as the main source of paper making raw material comes from the plant source. TNPL has realized the importance of biotechnology and its application to paper industry and has created advanced research facility to work on the Biotechnology and Bio-energy.

TNPL has around 6000 square feet of built-up area to accommodate two major research facilities to work on Plant Biotechnology (Plant Tissue Culture and Microbial Biotechnology and bio-energy). Besides, facilities like Polyhouse, Shade Net and an experimental field station of around five acres are attached to the new facility and plan to introduce new plant breeding facility to cater to the needs of above research programs.

TNPL has commissioned a state-of-the-art clonal production centre of capacity with a 15 million plants/year in the mill site. It is the largest pulp wood clonal production, research and development centre at a single location with world-class infrastructure facilities in India. TNPL subsidises the price of tissue culture seedlings those are supplied to farmers to promote the disease resistant trees with high yield. In May 2007, the establishment of CPRC was started with 8000 sq.m of fogging and misting chambers, 4000 sq.m of hardening chamber and 10000 sq.m open nursery with updated technological innovations on par with international standards. Provisions are made to establish various research programmes in micro and macro propagation of Eucalyptus, Casuarina and other alternative pulpwood species. Clonal mini-gardens and breeding mini- orchards are being established in CPRC to carryout breeding and tree improvement works. This would facilitate production of preferred, site-specific clones suited to individual operational areas and reduce the cost of clones to the company and emerge as a profitable enterprise to the farmers. The existing clonal propagation facilities at TNPL Unit 1 with the annual production capacity of 15 million clones has been enhanced to 30 million clones by adding additional infrastructure during the year. In addition, the newly established Plant Propagation Centre (PPC) at Mondipatti, TNPL Unit 2 will be able to produce about 25 million clones per annum, which shall produce cumulatively about 55 million clones per annum. Further the plant distribution centres were also established as decentralized nurseries at Muthuservamadam, Ariyalur district, Thuvar, Pudukottai district and Kattrampakkam, Villupuram district.

TNPL carries certification under Forest Stewardship Council® (FSC)® Principles and Criteria. FSC Principles are shown in Appendix A.

1.1 Background

TNPL currently manages FSC pulpwood plantations comes under Captive Plantation scheme and now included the Farmers raised Plantations (Farm Forestry) also under Scope of FSC® certification.

The features of Captive Plantation scheme are as follows:

Captive plantation Scheme

- Large barren land holders having 25 acres and above will be motivated to put their land under productive use.
- The land may be owned by single individual, family, government department or institution.

- The land would be taken either on long term lease spanning over a period of 6 to 30 years or on revenue sharing basis

Captive plantations operations conducted by TNPL fall into two broad categories:

- Plantations on the Land owned by private farmers under lease model
- Plantation on the Land owned by private farmers under revenue sharing model
- Plantations on the Land owned by Government and institutions under lease model
- Plantations on the Land owned by Government and institutions under revenue sharing

Plantations on the Land owned by private farmers under lease model:

Under this model the land owned by private farmers are considered to raise pulpwood plantations under captive plantation scheme. The MoU will be executed with private land owners and the lease amount to be fixed is Rs.1000/Annum/Acre.

Plantations on the Land owned by private farmers under revenue share model:

Under this model TNPL and the private land owners will execute MoU to raise pulpwood plantations under Gross Revenue sharing basis(70:30). The land owner will get 30% of the gross revenue from the income generated by sale of produce to TNPL at the prevailing market price. The revenue share will be shared at the ratio of 50:50 for the subsequent rotation.

Plantations on the Land owned by Government and Institutions under lease model:

The government waste land will be taken by TNPL on lease rent basis to raise pulpwood plantations under this model. The Government of Tamil nadu will allot its wasteland to TNPL through GO's/MoU and the lease value will be fixed based on the guideline value of land.

Plantations on the Land owned by Government and Institutions/Industry under revenue share model:

Under this model TNPL will execute MoU with Government/Institutions/Industry to raise pulpwood plantations under Gross Revenue sharing basis (70:30). The Government/Institutions/Industry will get 30% of the gross revenue from the income generated by sale of produce to TNPL at the prevailing market price. The revenue share will be shared at the ratio of 50:50 for the subsequent rotation.

Salient Features of Farm Forestry Scheme:

- Small and marginal farmer are being motivated to establish the plantation and maintain up to harvest.
- TNPL will supply superior quality seedlings / clones to the farmers at subsidized price and deliver the plants at the farmer's land.

- TNPL will offer technical assistance for planting and advisory services for maintenance till harvest at free of cost.
- Buy back assurance by TNPL with minimum support price or the prevailing market price whichever is higher at the time of harvest.
- Harvesting and transport of pulpwood from the farmers' field to factory at TNPL cost.
  - **Marginal**: This category refers to the farmers that possess farmland below 1 hectare.
  - **Small:** This category refers to the farmers who possess land between 1 to 2 hectares.
  - **Semi-Medium:** The farmers who possess land between 2 to 4 hectares come under this category.
  - **Medium:** This category refers to those farmers who have farmland between 4 to 10 hectares.
  - **Large:** Farmers possessing above 10 hectares of land for cultivation come under this category.
  - The Farm Forestry scheme FMU's having land holding between 0.50 acres to 300 acres

Under TNPL's Management Policy the clearing and conversion of native forest to non-forest uses is not permitted. TNPL is committed to employing the same high standards of plantation management and quality control in all of its operations.

TNPL employs professionally qualified, highly trained staff, and maintains quality operating systems to ensure the viability of the company and the plantation resources we manage. TNPL's team of forestry professionals has extensive experience within the plantation industry with planning, assessments, associated permits and operational supervision along with associated experience in research and development. TNPL is committed to undertaking and managing silvicultural prescriptions conducive to the long-term productivity of the properties we manage. Within the context of State and Local Government regulatory frameworks, and our own management strategies, which ensure environmental protection, we work cooperatively to address the needs of our FMU's when selecting a plantation management regime.

TNPL is committed to delivering resource owners with maximum sustainable returns for their plantation resource commensurate with the productive capacity of the land. Correct segregation and treatment of the plantation resource ensures that pulpwood products are always directed to their highest end-use value when markets permit. This
in turn maximises the return to the landowner by selling their product at maximum value and not allowing higher value products to be undersold.

TNPL ensures that its plantation management is based on the results of current and ongoing scientific research where available, and other sources of information, including expert opinion and practical experience. TNPL actively supports the conduct of relevant research activities carried out by other organisations.

1.2 Purpose of this Document and Planned Reviews

The purpose of this TNPL Plantation Management Plan is to outline TNPL's Corporate Goals for plantation management and describe the systems in place to achieve them. There are following four levels of management planning documents which together outline TNPL's approach to plantation management

- Forest management plan,
- Monitoring of plantation,
- Natural and High Conservation Value.
- Environment and Social Impact Assessment.

TNPL Forest Management Plan represents the top level of management planning, giving over-arching objectives for how plantation areas will be managed and describing the systems in place to achieve them.

FMU data is collected to cover each operational area under long-term management and the management of the values found within them. Operational specific management plans are developed for areas in which planting and harvesting are occurring.

The initial draft of our Plantation Management plan was distributed to a range of stakeholders including Local Government, community and environmental groups, and landowners in the regions where we had current operations. Comments from them were reviewed and, where appropriate, incorporated into this document.

TNPL welcomes feedback at any time and all comments will be considered for inclusion in our current and future policies, procedures and management plans. A major review of this Management Plan will take place at least once in every 5 years. Other minor revisions of the Plan may be made in the interim, in response to significant changes in legislation, standards or TNPL policies.

1.3. Management Planning

This topic covered all the applicable elements of Principle 7 of Forest Stewardship Council®, Forest Stewardship Standard for India: FSC-STD-IND-01-2022 EN in its operating areas in order to complies in TNPL operating areas.

TNPL having this management plan consistent with its policies and objectives and proportionate to scale, intensity and risks of its management activities. The management plan will be implemented and kept up to date based on monitoring information in order to promote adaptive management. The associated planning and procedural documentation given in the management plan will be sufficient to guide staff, inform affected stakeholders if any and interested stakeholders and to justify management decisions.

TNPL will proportionate to scale, intensity and risk of its management activities, set policies (visions and values) and objectives for management, which are environmentally sound,

socially beneficial and economically viable. Summaries of these policies and objectives are incorporated into the management plan and publicized.

- TNPL is having Forest Management Policy and FSC-FM Policy (vision and values) that contribute to meeting the requirements of this standard
- TNPL is having specific operational management objectives which depicted in the Management Plan that address the requirements of this standard are defined
- TNPL invested sufficient resources in management plan development and implementation, to ensure the development of a functional, effective and implementable management plan, containing all elements of Annex D of FSC-STD-IND-01-2022 EN
- Summaries of the management objectives are included in the management plan and made available upon request

TNPL is prepared and implement this management plan for the Management Unit which is fully consistent with the policies and management objectives as established according to Criterion 7.1 of FSC-STD-IND-01-2022 EN. This management plan will describe the natural resources like soil, etc., that exist in the operating areas and explain how the plan will meet the FSC certification requirements. This management plan cover plantation management planning and social management planning proportionate to scale, intensity and risk of the planned activities.

- This management plan includes TNPL Plantation management actions, procedures, strategies and measures to achieve the management objectives
- This management plan addresses the elements listed in Annex D of FSC-STD-IND-01-2022 EN which is implemented. This also includes Land ownership details and use rights, Nursery productions, Responsibility Matrix to implement the Plantation activities
- TNPL officials well as contractors are trained in their roles in implementation of the management plan based on the scale and intensity of plantation operations & management

This management plan includes verifiable targets by which progress towards each of the prescribed management objectives could be assessed. Example of Verifiable targets, and the frequency that they are assessed, are established for monitoring the progress towards each management objective are as follows:

- Site productivity, yield of all products harvested;
- Growth rates, regeneration and condition of the vegetation;
- Composition and observed changes in the vegetation;
- Water quality and quantity;
- Soil erosion, compaction, fertility and carbon content;
- Biodiversity and status of High Conservation Values;
- Sensitive cultural and environmental resources;
- Stakeholder satisfaction with engagement;
- Benefits of management operations provided to local communities;
- Number of occupational accidents;
- Overall economic viability of the Management Unit

TNPL management plan will be update and revise periodically the management planning and procedural documentation to incorporate the results of monitoring and evaluation, stakeholder engagement or new scientific and technical information, as well as to respond to changing environmental, social and economic circumstances. **The Management Plan will be revised and updated periodically consistent with Annex E of FSC-STD-IND-01-2022 EN to incorporate:**

- Monitoring results, including results of certification audits;
- Evaluation results;
- Stakeholder engagement results;
- New scientific and technical information:
- Changing environmental, social, or economic circumstances

The management plan revision is detailed discussed in chapter "**Period of Management Plan and Intermediate Revision" of this Management plan.**

TNPL made publicly available a summary of this management plan at free of charge. Excluding confidential information, other relevant components of the management plan will be made available to affected stakeholders if any on request, and at cost of reproduction and handling.

- TNPL made available of summary of the management plan and map to stakeholders upon request at no cost
- TNPL will update the public summary of management plan when it is revised
- Relevant components of the management plan, excluding confidential information, are available to affected stakeholders if any on request at the actual costs of reproduction and handling

2.0 FOREST MANAGEMENT POLICY

TNPL is committed to the principles of sustainable plantation management for the production of pulpwood and other values, as well as managing and mitigating environmental, economic, social and cultural impacts.

TNPL has the policy that it will select and raise pulpwood plantations only in the land, which are not converted from natural forests since Oct'1980.

TNPL's Forest Policy is publically available on TNPL's website (https://www.tnpl.com)

3.0 MANAGEMENT OBJECTIVES

- To rehabilitate and restore the degraded and marginal farm lands through integrated land use and sustainable plantation management for sustained production of pulpwood.

- To reduce the pressure on natural forest and conserving/restoring them by establishing industrial wood plantations outside the traditional natural forest

- To improve the socio-economic status of the small and marginal farmers and local community

- To augur the edapho-climatic factors through integrated soil and water conservation strategies coupled with multiple cropping system

- To ameliorate the environment through multi species plantation forestry programme and to establish Clean Development Mechanism

- To augment the sustained supply to create self reliance in raw material availability

4.0 PLANNING

TNPL undertakes Four types of plantation management under Captive plantations and one type of management under Farm Forestry scheme:

Plantation management where TNPL manages plantations from planting to harvesting operations under:

Plantations on the Land owned by private farmers under lease model

- Plantation on the Land owned by private farmers under revenue sharing model
- plantations on the Land owned by Government and institutions under lease model
- Plantations on the Land owned by Government and institutions under revenue sharing

Similarly, TNPL is providing superior planting material at subsidized cost and free technical support to the farmers where the entire plantation is maintained by the Farmers. Under this scheme, TNPL is getting application from Farmers along with their basic details like Address details, land details, etc., to enroll them under Farm Forestry Scheme. Accordingly, they will become members of TNPL under TNPL plantation scheme.

An initial land assessment is conducted by a member of TNPL's operations team on lands where owners have asked for a proposal from TNPL to carry pulp wood plantation. This land assessment looks at various technical and commercial, silvicultural system proposed and any aspects of the land that may prevent acceptance into the TNPL Plantation Management System. If the land is suitable, TNPL will enter an agreement/application with land owner and planning work on the plantation development may then begin.

The planning for raising plantations has been scheduled up based on the guidelines given in the TNPL Plantation Management plan. The planning process takes into consideration:

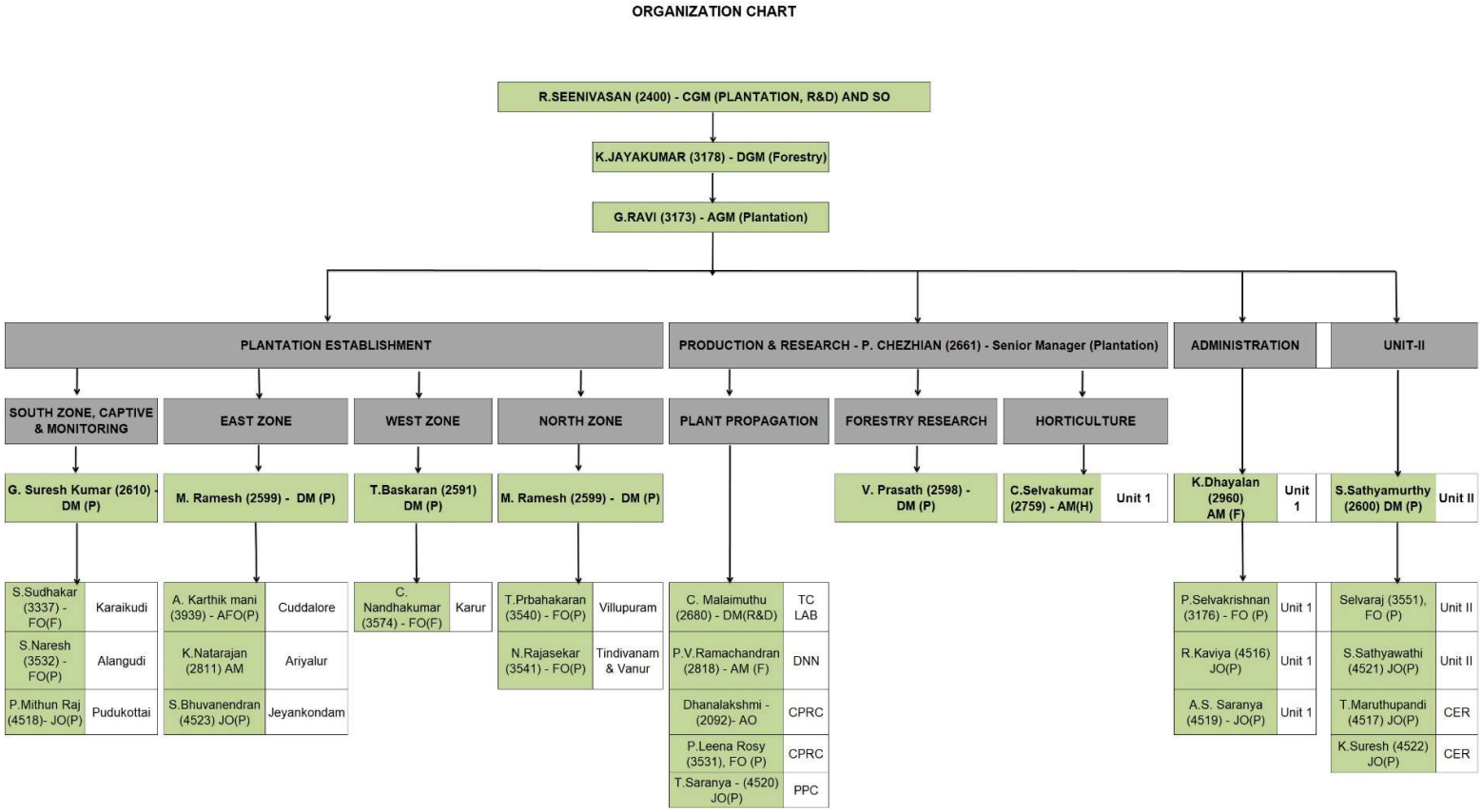
- Selection of species, varieties, etc.,
- The evaluation of natural, cultural, social, high conservation and biodiversity values if any
- Catchment management and stream protection if any
- Fixing up contractor for raising pulpwood plantations
- Stakeholder requirements

The planning process has a significant mapping component in which the entire captive plantation area will be mapped by using GPS technology. Also if any watercourses, and other natural and cultural values is available the same will also be mapped.

TNPL maintains an operational planning process that sets annual management objectives and targets to support the achievement of corporate goals and the delivery of performance outcomes. This process is supported by reference to a captive journal maintained by TNPL which identifies and assesses the significance of aspects and impacts of activities relevant to the requirements of the FSC® certification standards that TNPL subscribes to. The TNPL administrative structure for effective planning and executions Plantations works are as follows:

4.1.Organizational Setup

The plantation department has created an organizational setup to cater the man power needs of plantation and harvesting sector. The organizational set up planned for the management of plantation is depicted below.



5.0 RESOURCE BASE

Under the Indian forest act 1988, an organization's Defined plantation area consists of:

an area of forest (including land and water) to which the requirements of this Standard are applied. It includes productive and non-productive forest areas, streamside reserves, conservation areas, and roads, etc….

TNPL defined the scope of its FSC® certification to include both plantation management operated by the farmers directly (Farm Forestry) and plantation management operations managed by TNPL (Captive plantations) on private and government land.

The plantations consist of predominantly multi-aged plantations of drier forest types, which are managed by TNPL through contractors. The FMU pools that the makeup captive plantation is subjected to changes periodically as land pass into and out of TNPL's management control.

Properties are included in the TNPL Forest certification pool once the agreement has been signed between TNPL and land owner. Later provisional boundaries defined and fixed for the new FMU and silviculture, natural, cultural, conservation values assessed.

Under Forest Stewardship Council certification, Plantation areas land is owned by land owner but managed by TNPL are considered individual Forest Management Units (FMUs). Under this captive plantation scheme TNPL enter a MoU with the land owners. The land owners giving their land to TNPL to raise pulpwood plantations either on lease or revenue share basis. The pulpwood plantations will be raised on this land by TNPL by its own cost. Hence all activities carried out on this land starting from land development till harvest is done by TNPL only and the land owners is not having any responsibility on this except giving land to TNPL. TNPL has management control and responsibility over plantation areas included in the FMUs. Under Farm Forestry scheme, the entire plantation is managed by farmers where TNPL is providing superior planting material at subsidized cost and free technical support

5.1. TNPL Plantation Operation area

Though, TNPL has very limited land resources, it motivates land owners of large extent of unutilized lands and willing farmers to raise pulpwood plantations. Initially TNPL operates all over the Tamil Nadu to establish pulpwood plantations in a decentralized approach but now the operational area has been categorized into 4 zones and 12 regions (Table.1) and the plantation programme is now through regional approach.

5.1.1. Regional Approach

The TNPL plantation programme has been prioritized to establish plantations on a regional approach. The entire state of Tamil Nadu has been divided into 12 regions and based on the availability of resources coupled with soil quality and the community interest the plantation have been developed.

5.1.2. Regional Management Plan

Each region has been headed by Regional Officer and assisted by Supervisors and Field Assistants. The regions are monitored by Deputy Manager Plantations. The Regional Officer in consultation with the head unit of plantation department carries out plantation activities like land preparation, land management, pitting, planting, plantation management, harvest and transportation.

Table .1 TNPL Plantation Operational Regions and Responsibilities to implement Plantations Activities

ZONE	Responsibilities	REGION	Responsibilities
NORTH ZONE	Zonal Manager	TINDIVANAM	Regional Officer
		VANUR	Regional Officer
		VILLUPURAM	Regional Officer
EAST ZONE	Zonal Manager	ARIYALUR	Regional Officer
		CUDDALORE	Regional Officer
		JAYANKONDAM	Regional Officer
SOUTH ZONE	Zonal Manager	ALANGUDI	Regional Officer
		PUDUKKOTTAI	Regional Officer
		KARAIKUDI	Regional Officer
WEST ZONE	Zonal Manager	KARUR	Regional Officer
		KULITHALAI	Regional Officer
		MANAPPARAI	Regional Officer

Responsibility Matrix

DETAILS	TNPL	FARMERS	CONTRACTORS	WORKERS
Implementation of Plantation Activities				
Raising Plantation				
Maintenance of Plantations				
Monitoring of Plantations				
Harvesting Plantations				
Training on Various Aspects				
Maintaining Safety in Working Areas				
Identification & Protecting HCVF				
Assessing and Safeguarding Environment Values				
Assessing and Safeguarding Socio Economic Values				

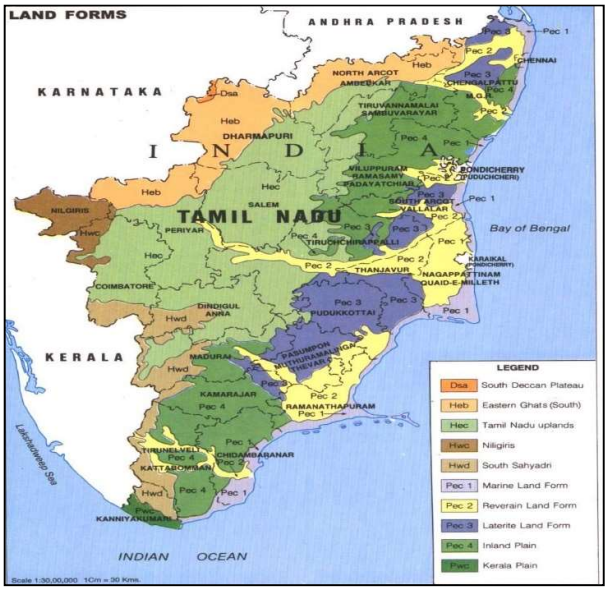
	HIGH
	MEDIUM
	LOW

6. DESCRIPTION OF THE RESOURCES

6.1. Configuration of the Ground:

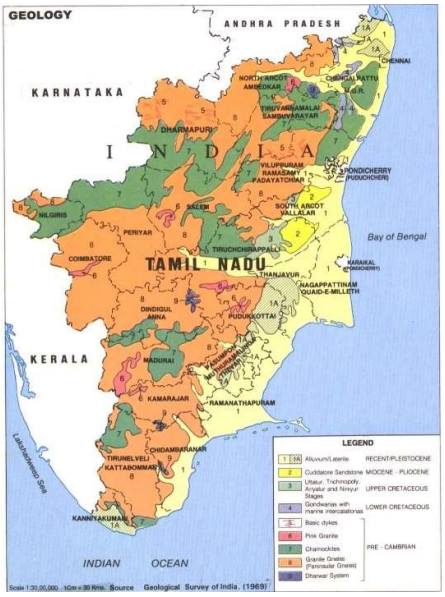
The areas of operation of TNPL are almost lying in plains with some slight undulations. Otherwise lands are with flat topography in general. Some areas in Kadavur block of Karur Region and some portions of Dharmapuri & Krishnagiri districts have some undulating lands and depressions. Altitudes of these lands vary for a few meters above the mean sea level ranging from 10 to 200 meters. Slope is almost gentle in all the areas.

Generally they are barren lands having poor fertility and productive capacity with unimportant natural vegetation cover with scattered thorny bushes here and there. In some districts rain fed cultivation is done. Occasionally fields having irrigation facilities also are used for raising such plantation crops (Topography map).

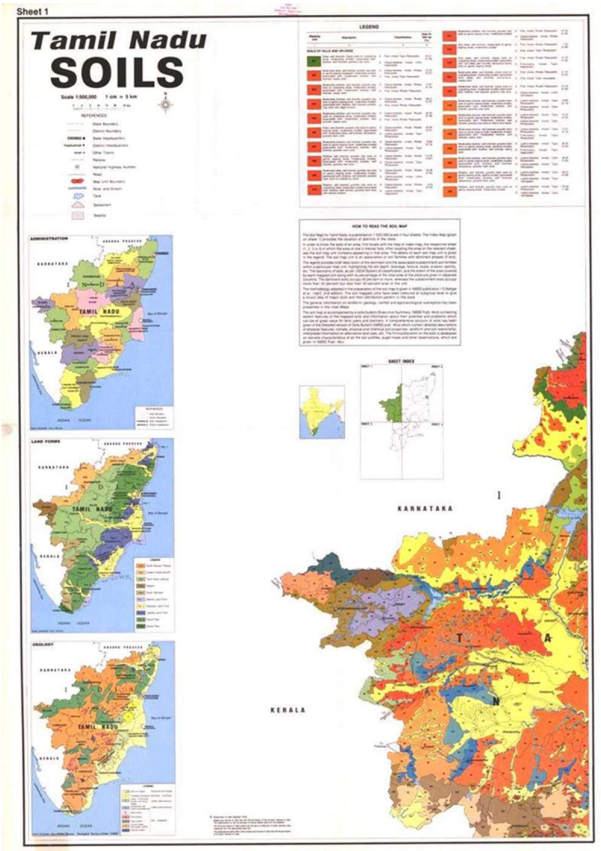


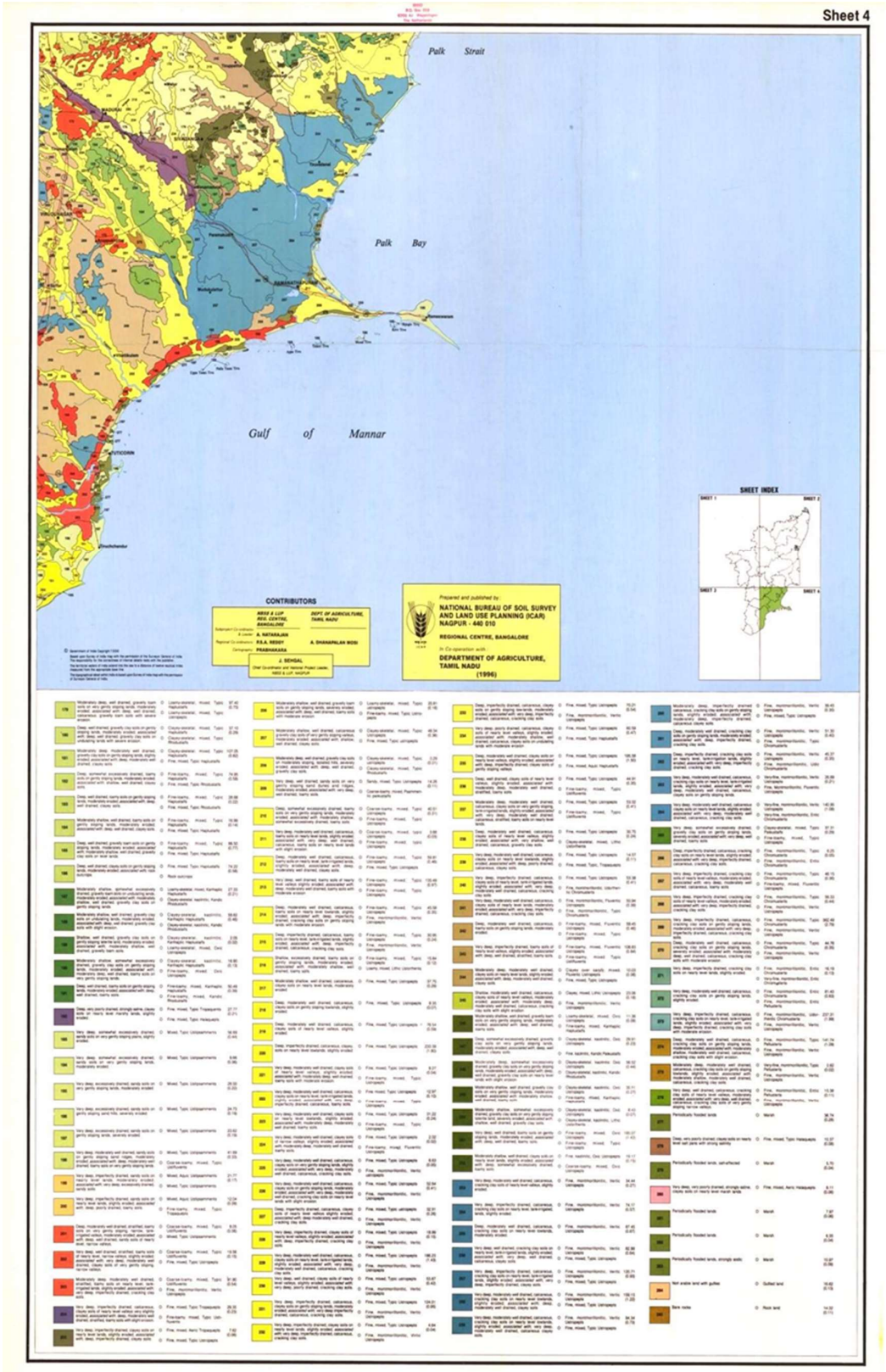
6.2. Geology, Rock and Soil:

The area represents various geological formations and is widely ranging from oldest Archeans to the recent laterites and alluvium. Sandstones occur in Villupuram and Sivagangai Regions. Deep alluvial deposits are found in certain portions of Thanjavur, Thiruvarur, Trichy and Theni districts. Major parts of Villupuram district and Pondicherry are covered with metamorphic crystalline rocks of Archean age belonging to the Charnokite khondalite group. Pudukottai and part of Trichy district comprise of Gneisses and Granites with pockets of Cretaceous sedimentary deposits. Ancient crystalline rocks occur in most part of Sivagangai and Ariyalur districts. (Geology Map).



The soils occurring here are broadly classified as red soils, black soils, lateritic soils, alluvial soils, sandy soils and alkaline soils. Sandy soils occur in some parts of Sivagangai, Cuddalore, Nagappattinam districts and in Pondicherry. Lateritic soils are seen in all regions except some parts of Villupuram district. Alluvial soils are observed in Trichy, Thanjavur, Thiruvarur and Pudukottai districts. Patches of alkaline are seen in all regions in small extents with its preponderance in certain parts of Villupuram, Sivagangai and Ariyalur districts (Soil map)

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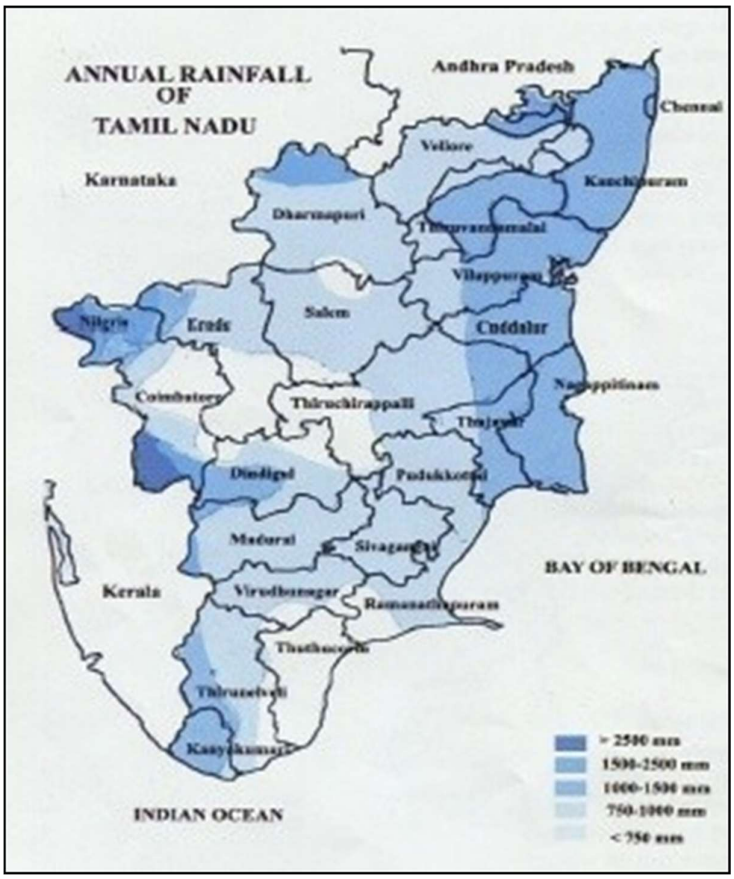
(1996)

6.3 Climate and Rainfall

The climate is typically tropical. The climate is hot and dry in general and low degree of humidity is experienced in the regions of TNPL. The temperature exceeds more than 40oc in hot months and go down to 22oc in winter. The areas of operation of the regions of TNPL receive both South West and North East monsoon ranging from 35% to 43% and 42% to 52% respectively. The balance rainfall is obtained in winter season and in hot weather season. The North East monsoon is received mainly in the form of cyclonic rains during October to December. The annual rainfall ranges from 215 mm to 1200mm per annum. (Rainfall map)



High Rainfall Regions: It covers The Nilgiris, the coastal belt of the Cuddalore, Kancheepuram districts and Palani hills.

Medium Rainfall Regions: Western part of Cuddalore, Tiruvallur districts, whole of Vellore, Thiruvannamalai, eastern parts of the Salem, Western part of Thanjavur, Nagapattinam, eastern and northern parts of Trichy, eastern part of Madurai, Dindigul, northern part of Ramanathapuram, Sivaganga, Virudhunagar, Coimbatore and Salem.

Low Rainfall Regions: Central and Southern parts of Ramanathpuram, Sivaganga, Virudhunagar, Thoothukudi and Tirunelveli districts and Central part of Coimbatore, Central and Western parts of Madurai, Dindigul and the Southern half of Tiruchirapalli.

6.4. Agro Climatic Zones of Tamil Nadu:

The State was divided into 7 Agro climatic zones viz., north eastern, north western, Cauvery delta, western, southern, high rainfall and hilly zones. However, TNPL Plantation area falls mostly in the five agro climatic zones except high rainfall and hilly zones of the state. The Agroforestry practices in these zones are confined mostly to the traditional silvipastoral model (with Acacia leucophloea and Cenchrus ciliaris) coupled with silviagricutural systems. The dominant trees planted across farm lands in a sporadic manner included Teak, Neem, Casuarina, Acacia, Vengai etc. However, Agroforestry plantation on a large scale to meet the industrial raw material requirement is dismally modest in the operational district areas.

S.NO	Agro-Climatic Zone	District
1.	Western zone	Coimbatore, Erode, Dindigul, Theni
2.	Southern zone	Madurai, Ramanathapuram, Tirunelveli, Sivaganga, Virudhunagar, Thoothukudi, Pudukottai, Karur
3.	North Eastern zone	Kancheepuram, Thiruvallur, Vellore Thiruvannamalai, Cuddalore, Villupuram
4.	North Western zone	Dharmapuri, Krishnagiri, Salem, Namakkal, Perambalur
5.	Delta zone	Thanjavur, Thiruvarur, Nagapattinam Tiruchirapalli
6.	High Rainfall zone	Kanyakumari
7.	Hilly and Tribal zone	Nilgiris

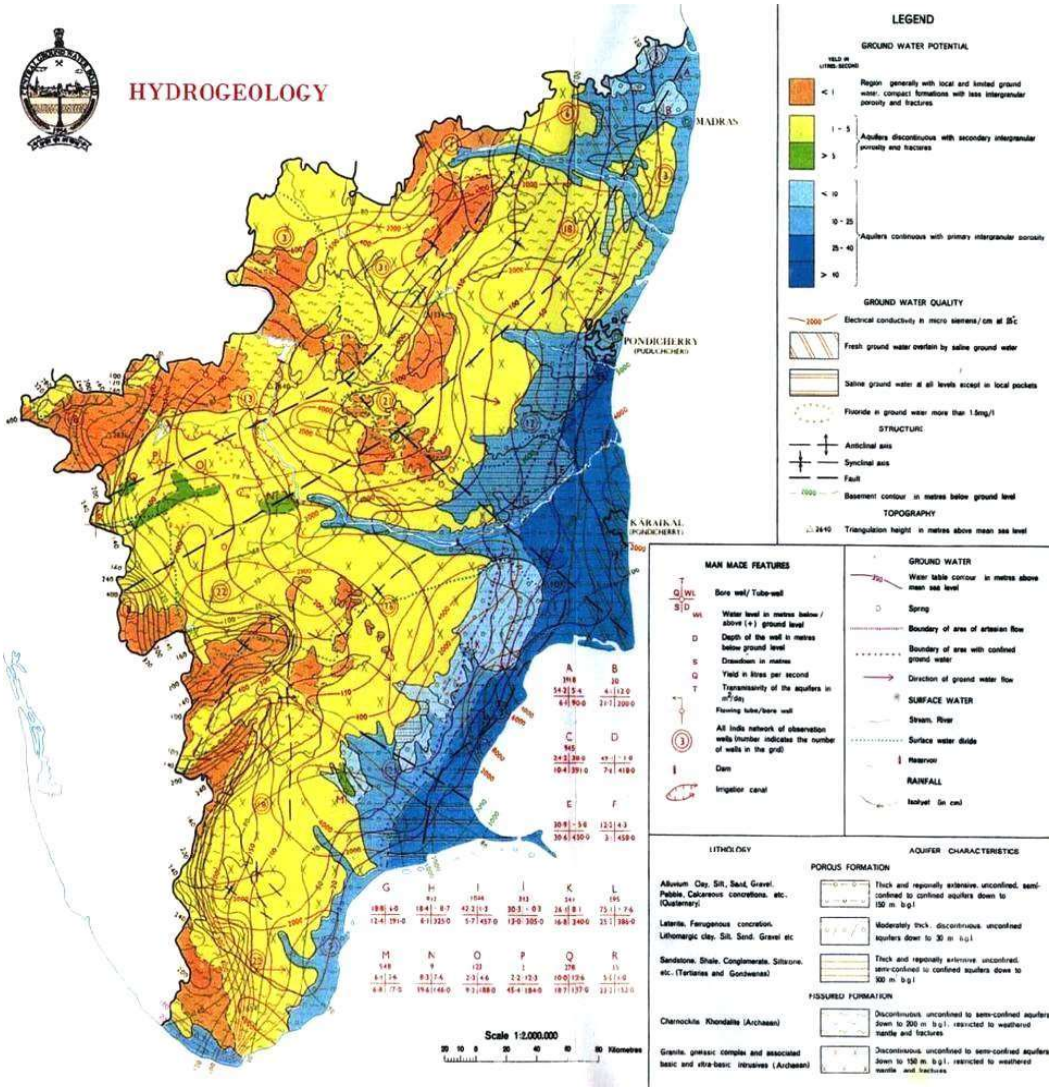
Climatic, Edaphic and topographic factors of the locality

Source: Dept. of Economics & Statistics, TN

S.No	Name of the District	Area (Sq.kms)	Latitude	Longitude	Temperature		Avg. Rainfall (mm)
					Max	Min	
1	Thiruvallur	3422	12°15' and 13°15' N	79°15' and 80°20' E	37.9° C	18.5° C	1104.40
2	Kanchipuram	7857	11° 00' to 12° 00' N	77° 28' to 78° 50' E	36.6° C	19.8° C	1213
3	Thiruvannamalai	6191	11.55° and 13.15° N	78° 20' to 79° 50' E	34.93° C	19.36° C	1028.7
4	Vellore	6077	12° 15' to 13° 15'N	78° 20' to 79° 50'E	39.5 °C	15.6 °C	917
5	Krishnagiri	2,024	11º 12' N to 12º 49' N	77º 27' E to 78º 38' E	38.5 °C	19.4 °C	830
6	Vilupuram	7222.03	11°38' N & 12°`20' S	78°15' W & 79° 42' E	35 °C	21.2 °C	617.4
7	Cuddalore	3,678	15°5/11 11' and 12°35' N	780 38' and 800 E	37.7° C	20.2° C	528
8	Perambalur	3690.07	11.23° N	78.88° E	36.8° C	20.0° C	908
9	Ariyalur	1949	11.28° N	78.62° E	37.1° C	20.4° C	875
10	Thanjavur	9250	9°50' and 11°25' N	78° 45' and 70° 25' E	36° C	20.1° C	1008
11	Thiruvarur	2097.09	10° 20' and 11° 07' N	79° 15' and 79° 45' E	39.7° C	22.6° C	481.15
12	Nagapattinam	2715.83	10.10' and 11.20' N	79.15' and 79.50' E	32° C	24.6° C	1188.6
13	Pudukottai	4663	9.50' and 10.40' N	78.25' and 79.15' E	38.7° C	19.6° C	921.6
14	Thiruchirapalli	4,403.83	10° to 11° 30' N	77° 45' to 78° 50' E	37.7° C	18.9° C	821.4
15	Namakkal	3363	11.00' and 11.36' N	77.28' and 78.30' E	44.2°C	20.1°C	303.45
16	Salem	5205	11°14' and 12° 53' N	77° 44' and 78° 50' E	37.9° C	20.0° C	363.5
17	Dharmapuri	4497.77	11°47' and 12°33' N	77° 02' and 78°40' E	38° C	17° C	895.56
18	Karur	2,895.57	11.00' to 12.00' N	77.28' to 78.50' E	37.1° C	19.1° C	307.55
19	Erode	8161.91	10°36' and 11°58' N	76°49' and 77°58' E	37.9°C	20°C	660.10
20	Coimbatore	7469	10 ° 10' and 11 ° 30' N	76 ° 40' and 77 ° 30' E	39.2° C	16° C	259.5
21	Dindigul	6266.64	10°5' and 10° 9' N	77°30' and 78°20' E	34.3°C	8°C	494.35
22	Sivagangai	4,189	9.43' and 10.2' N	77.47' and 78.49' E	38° C	23° C	345.5
23	Ramanathapuram	4089.57	9° 05' and 9°50' N	78°10' and 79°27' E	37.8°C	22.3° C	827
24	Madurai	3741.73	9°30'and 10°30' N	77°and 78°30' E	39.5° C	21.9° C	214.25
25	Theni	3242.3	9°30' and 10° 30' N	77° and 78° 30' E	38.5° C	21.3° C	281
26	Tirunelveli	6,823	08° 8' and 09° 23' N	77° 9' and 77° 54' E	37.1° C	20° C	814
27	Viruthunagar	4232	11° 00' and 12° 00 N	77° 28' and 78° 50' E	37°C	20°C	812
28	Thoothukudi	4,621	8.72° N	78.12° E	40.5° C	18.4° C	468

6.5. Water supply:

Water supply is mostly obtained from wells, ponds and tanks in all regions. Cauvery and Coleroon are the two main rivers and they traverse along with their tributaries in Karur, Trichy, Perambalur and Cuddalore districts of TNPL. During the summer, most of the streams, rivers and tanks usually remain dry till the outbreak of monsoon. All the regions will suffer from water scarcity during summer. Water table varies from place to place. It is as high as 2 to 3 meters in coastal areas and areas which are close to rivers. But it is more than 30 to 40 meters in dry areas. (Hydrogeology map)



6.6. State of Boundaries:

In the smaller extent captive plantations the plantation boundary usually tallies with the field boundary of the survey field. In the case of large plantations, survey the areas through Government Survey department, maintain the certified survey maps and to demarcate the boundary by pillars to avoid disputes in future.

6.7. Legal Position:

All lands dealt under Captive plantations by TNPL belong to the owner of the lands ie., either farmers or the Government/organizations whose lands have been taken over by TNPL for raising plantations either on lease or on revenue sharing basis as per the agreement executed by TNPL and the Land owner. Whereas , under Farm Forestry scheme, the possession of land belongs to Individual Farmers/organization and institution and the entire plantation maintained by them on their own. TNPL recognises the importance of ensuring that its plantation management practices comply with requirements of all relevant legislation and policies at both the State and central government level and agreements. The formal agreements/applications entered between TNPL and land owners are structured to ensure that TNPL establishes a clear legal and long term rights to use the land and manage the plantations under its control for which the certification are sought.

6.8. Rights and Concessions:

The admitted rights for both TNPL and Landowners are permitted as per the agreement/applications terms and conditions. Since the land taken by TNPL for raising plantations are legally patta land of either individual farmers or institutions or government, the local communities/stakeholders are not having any legal or customary tenure or use rights on these lands and to utilize the plantation resources. TNPL also raising the pulpwood plantations based on the agreement/application executed between TNPL and land owners by which the landowners knows the pulpwood plantation establishment activities by TNPL. Hence, there will not be occurrence of free and informed consent to local communities/stakeholders/affected parties. TNPL plantations are developed with an objective to improve the socio-economic status of local communities and not having any undesired impact on society. So, there will not be any affected parties in and around TNPL captive plantations operating areas.

Since TNPL is always committed to work towards welfare of the society, TNPL engages the local labourers for its clonal production, plantation establishment and harvesting activities. Every year TNPL is procuring about 10.00 lakhs MT of pulpwood to its Units @ 3000 MT/day. About 10.00 lakhs Mandays are required for harvesting 10.00 lakhs MT of pulpwood @ 1 Manday/MT. Similarly, for producing 510 lakhs clonal in a year about 1.68 lakhs Mandays is required @ 460 Mandays/day. Further, TNPL generates employment opportunities for about 0.10 lakhs Mandays in a year towards plantation establishment activities. In cumulative TNPL providing employment opportunities for local communities about 11.78 lakhs Mandays in a year for its plantation activities. By generating and providing this much huge quantity of employment opportunities, TNPL improves the socio-economic status of local community, farmers and labourers.

Further, TNPL also permitting the local communities to collect and remove firewood without causing damage to the stumps. It also helped to avoid any fire occurrence in the plantations.

TNPL also permitting the local communities to graze their animals in the plantation area without affecting the stumps. TNPL also permitting the local communities to worship the cultural sites, i.e., temple available in the land if any. For example, A/m.Gandhimathi Amman temple is located near to Paruthipadu captive plantation (FMU Code : S04031). The local

villagers are requested to allow about 50 acres of land for this temple festival activity and graze their animals. Therefore, TNPL not raised plantations in these 50 acres and permitted the local villagers to utilise the land for the festival activities as well as grazing activities. By these ways, TNPL ensures the welfare of the local communities.

TNPL involved the local communities, stakeholders, affected parties if any, various research institutes and socio-environmental organizations to develop and implement plantation management plan to promote its plantation schemes.

6.8.1. Community Relations:

In TNPL plantation areas there is no presence of local communities those that are affected by management activities. Further, TNPL operating its plantation schemes in the PATTA LAND where the legal rights bind to the land owner and local communities are not having legal or customary tenure or use rights on that land area. Due to this no situation that requires FPIC in the TNPL plantation operating areas.

However, if any legal or customary tenure or use rights of local communities are present in future in TNPL operating areas then TNPL will take the following actions to complies the Principle 4 of Forest Stewardship Council®, Forest Stewardship Standard for India: FSC-STD-IND-01-2022 EN in its operating areas.

TNPL will identify the local communities that exist within the Management Unit and those that are affected by management activities if any. TNPL will then, through engagement with these local communities, identify their rights of tenure, their rights of access to and use of forest resources and ecosystem services, their customary rights and legal rights and obligations that apply within the Management Unit.

- The local communities that exist in the Management Unit and/or those that may be affected by management activities (either upstream or downstream) will be identified.
- Through culturally appropriate engagement with the local communities identified the following will be documented and/or mapped:

    - Their legal and customary rights of tenure;
    - Their legal and customary access to, and use rights, of the forest resources and ecosystem services;
    - Their legal and customary rights and obligations that apply;
    - The evidence supporting these rights and obligations;
    - Areas where rights are contested between local communities, governments and/or others.
    - Summary of the means by which the legal and customary rights, and contested rights are addressed by TNPL; and
    - The aspirations and goals of local communities related to management activities.

TNPL will recognize and uphold the legal and customary rights of local communities to maintain control over management activities within or related to the Management Unit to the

extent necessary to protect their rights, resources, lands and territories. Delegation by local communities of control over management activities to third parties through Free, Prior and Informed Consent.

- Through culturally appropriate engagement local communities will be informed of when, where and how they can comment on and request modification to management activities to the extent necessary to protect their rights
- The legal and customary rights of local communities to maintain control over management activities will not be violated by TNPL
- In case the evidence exists that legal and customary rights of local communities related to management activities have been violated the situation is corrected, if necessary, through culturally appropriate engagement and/or through the dispute resolution process
- Free, prior and informed consent will be granted by local communities prior to management activities that affect their identified rights through a process that includes:
    - Ensuring local communities know their rights and obligations regarding the resource;
    - Informing the local communities of the value of the resource, in economic, social and environmental terms
    - Informing the local communities of their right to withhold or modify consent to the proposed management activities to the extent necessary to protect their rights and resources; and
    - Informing the local communities of the current and future planned forest management activities
- If the process of Free Prior and Informed Consent has not yet resulted in an FPIC agreement, TNPL and the affected local communities will be engaged in a mutually agreed FPIC process that is advancing, in good faith and with which the community is satisfied.

TNPL will provide reasonable opportunities for employment, training and other services to local communities, contractors and suppliers proportionate to scale and intensity of its management activities.

- Qualified people in the local communities will be given preferential opportunities in employment and contracting.
- TNPL will give preference to local vendors of equipment and services, subject to cost considerations.

TNPL will implement additional activities, through engagement with local communities that contribute to their social and economic development, proportionate to the scale, intensity and socioeconomic impact of its management activities.

- Opportunities for local social and economic development will be identified through culturally appropriate engagement with local communities and other relevant organizations
- TNPL will supports activities that contribute to the social and economic development of the area

Through engagement with local communities, TNPL will take action to identify, avoid and mitigate significant negative social, environmental and economic impacts of its management activities on affected communities. The action taken will be proportionate to the scale, intensity and risk of those activities and negative impacts.

- Through culturally appropriate engagement with local communities, measures will be implemented to identify, avoid and mitigate significant negative social, environmental and economic impacts of management activities.
- When negative social, environmental and economic impact are reported, prevention and mitigation measures will be identified and implemented in consultation with local communities
- TNPL will conducts such assessment once in a year or at least once during the lifetime of the management plan, or sooner if there is any significant change in management or scope and scale of operations
- TNPL will undertakes a due process of stakeholder engagement during the social and environmental assessments, and maintains records.

TNPL through engagement with local communities, TNPL will have mechanisms for resolving grievances and providing fair compensation to local communities and individuals with regard to the impacts of management activities of TNPL.

- A publicly available dispute resolution process will be in place, developed through culturally appropriate engagement with local communities
- The dispute resolution process developed by TNPL has, at the minimum, the following components:
  - Process for complaint receipt - including formal, informal or anonymous complaints
  - Acknowledgement of complaints
  - Time period for attending to the complaint
  - Setting up an ombudsman authority to investigate any complaints or disputes
  - Further steps available to the aggrieved parties in case the matter is not resolved to satisfaction
- Grievances related to the impacts of management activities will be responded to in a timely manner, and are either resolved or are in the dispute resolution process
- An up to date record of grievances related to the impacts of management activities will be held including;
  - Steps taken to resolve grievances
  - Outcomes of all dispute resolution processes including fair compensation to local communities and individuals; and
  - Unresolved disputes, the reasons they are not resolved, and how they will be resolved.
- TNPL will cease operations in areas while disputes exist of Substantial magnitude, Substantial duration and Involving a significant number of interests.

Through engagement with local communities, TNPL will identify sites which are of special cultural, ecological, economic, religious or spiritual significance, and for which these local communities hold legal or customary rights. These sites will be recognized by TNPL, and their

management and/or protection will be agreed through engagement with these local communities.

- Sites of special cultural, ecological, economic, religious or spiritual significance for which local communities hold legal or customary rights will be identified through culturally appropriate engagement with the participation of local communities and are recognized by TNPL
- Measures to map and protect such sites will be agreed, documented and implemented through culturally appropriate engagement with the local communities. Such sites will be documented, demarcated on maps, and, where possible, in the field. If local communities determine that physical identification of sites in documentation or on maps would threaten the value or protection of the sites, then other means will be used.
- TNPL officials, contractors, workers, etc., will be trained in procedures for identification and protection of such sites of special significance.
- Wherever sites of special cultural, ecological, economic, religious, archaeological or spiritual significance are newly observed or discovered, TNPL will cease its activities immediately in the vicinity until protective measures have been agreed to with the local communities, and as directed by local and national laws.

TNPL will uphold the right of local communities to protect and utilize their traditional knowledge and shall compensate local communities for the utilization of such knowledge and their intellectual property. A binding agreement as per Criterion 3.3 of standard will be concluded between TNPL and the local communities for such utilization through Free, Prior and Informed Consent before utilization takes place, and will be consistent with the protection of intellectual property rights.

- Traditional knowledge and intellectual property will be protected and will be only used when the owners of that traditional knowledge and intellectual property have provided their Free, Prior and Informed Consent formalized through a binding agreement.
- Local Communities will be compensated per the binding agreement reached through Free, Prior and Informed Consent for the use of traditional knowledge and intellectual property
- TNPL will establish and implement procedures for Access and Benefit Sharing (ABS) agreed with local communities and as directed by applicable laws and conventions

6.8.2. FPIC PROCEDURES

Based on FSC Guidelines for the Implementation of the Right to Free, Prior, and Informed Consent (FPIC) FSC-GUI-30-003 V2.0 – EN, TNPL prepared guidelines of FPIC procedures, elements of each step and actions to be considered for each elements of steps as follows:

What are the elements of FPIC?

Free: consent is given voluntarily and absent of coercion, intimidation or manipulation. The process is self-directed by the community from whom consent is being sought unencumbered by coercion, expectations or timelines that are externally imposed.

Prior: consent is sought sufficiently in advance of any authorization or commencement of activities.

Informed: engagement and type of information that should be provided prior to seeking consent and also as part of the ongoing process. Information should be accessible, clear, consistent, accurate, constant, and transparent and delivered in appropriate language and culturally appropriate format.

Consent: refers to the collective decision made by the rights-holders and reached through the customary decision-making processes of the communities.

STEP BY STEP FPIC PROCESS

Step 1: Identify rights holders and their rights through engagement

Step 2: Prepare for further engagement and agree on the scope of the FPIC process

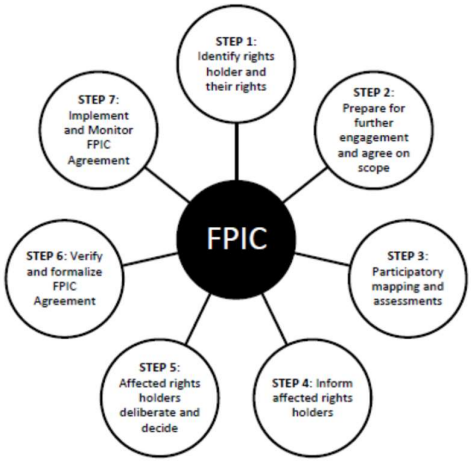
Step 3: Undertake participatory mapping and impact assessments

Step 4: Inform affected rights holders

Step 5: Negotiate and allow rights holders to decide on an FPIC proposal

Step 6: Verify and formalize the FPIC agreement

Step 7: Implement and monitor the FPIC agreement.



STEP 1: Identify the Rights Holder and their Rights through Culturally Appropriate Engagement

Elements of Step 1

1.1 Explore regulatory approaches to FPIC

- Using the Best Available Information, determine the applicable laws and regulations

- Consult with the FSC National Office, SDG, interim national standards and CBs to find out if they have already evaluated national laws relevant to upholding the right to FPIC.
- Consider consulting with national level Indigenous peoples' organizations or non-governmental organizations (NGOs) involved in protecting human rights.
- There may be an opportunity to collaborate with organizations within a region or state to conduct a regional gap analysis.

1.2 Identify rights holder and their rights

- Consider engaging local experts, regional organizations and secondary information sources (e.g., census data research and grey literature) and the FSC National Office, ensuring the experts are made aware of the use of the information in the FPIC process.
- Prepare a preliminary overview of all rights holders within the FMU or those that may be affected by management activities.

1.3 Identify representatives and governance structures

- Identify and document decision-making institutions of all rights holders.
- Document the type of governance system used, e.g., traditional/customary, state-legislated/imposed, or other).
- Document the role of women, youth and elders, keeping in mind UNDRIP (Articles 21 and 22) and ILO 169

1.4 Inform rights holder of proposed management activities

Provide information on the FSC system, including:

- Status as a voluntary system that in most cases goes beyond legislation for forest management and stakeholder engagement,
- Inclusion of customary rights as legitimate rights claims.
- Provide information that is a fair reflection of what can be expected from the proposed management activity; do not exaggerate the potential benefits or hide the risks.
- Provide information in a language and format that is clear and appropriate to the context and provide resources for expert assistance, if required.
- Verify that the information was understood.

1.5 Identify claims of legal and/or customary rights

- Document all claims of existing rights identified through research and engagement with the rights holder, whether they are affirmed by the rights holder or not.
- Be inclusive and respectful of cultural protocols and decision making when identifying customary rights

1.6 Determine willingness to participate in future negotiations on proposed management activities

- Communicate an understanding of the decision to continue engagement, or not, in a full FPIC process.
- Alternative engagement processes may be discussed.
- Continue to make available all management activity information requested by the rights holder, to the extent necessary to protect their rights.
- If the right holder has not taken a decision, indicate whether the process in ongoing
- Demonstrate that the ongoing process is satisfactory to the rights holder

STEP 2: Prepare for Further Engagement and Agree on Scope of the FPIC Process Agreement

Elements of Step 2

2.1 Involvement of others in the engagement process

While the rights holder themselves, and their delegated representatives, are the primary parties to the engagement process, other mutually agreed experts and stakeholders might be asked for support. They include government institutions, NGOs, Indigenous Peoples' organizations, and scientific institutions that may have a critical role in the implementation of the FPIC process and the FPIC Agreement.

2.2 Establish a structure with trained personnel and resources

- Appropriate to scale, intensity and risk (SIR), establish an internal structure to deal explicitly with the rights holders' engagement processes.
- Receive comprehensive orientation on the culture of the rights holder.
- Be trained in recognizing and respecting the protocols and values of the rights holder.
- Be trained in effective communication and translation of complex legal issues.
- Be encouraged to seek additional expertise when needed.
- Ensure the certification team can intervene directly in the decision-making bodies of the organization with strong internal communication (e.g., board, management, council).
- Ensure the team has dedicated materials and equipment

2.3 Develop appropriate communication and information strategies

- Consider prioritizing direct communication (face-to-face) as the default method, unless high levels of literacy are apparent, or circumstances dictate otherwise.
- Consider developing a formal plan specific to the FPIC process to ensure that all aspects are communicated to the rights holder and CB.
- Ensure culturally appropriate methods for sharing information.
- Present complete information as early as possible

2.4 Engage with affected rights holder and develop a Process Agreement

- Establish a mutual understanding and agreement on the need for a Process Agreement, or protocol, to support the FPIC process.
- Consider hiring a community facilitator/interpreter.
- At this early stage consider the involvement of an independent verifier or observer to the FPIC process and discuss with the affected rights holder.
- Describe each of the steps that require engagement, and, potentially, a decision from representatives.
- Identify representatives chosen by the rights holder to participate in various steps of the FPIC process.
- Confirm the internal decision-making process to address FSC FPIC requirements and identify indicators of its successful implementation.

2.5 Further define management activities likely to affect rights holder

- When possible, confirm that external advisors to the process are known, respected and trusted by the affected rights holder.
- Provide full content of the proposed management activities to the affected rights holder.
- Describe the resources proposed for harvesting (e.g., species, estimated volume, etc.) and the type of potential benefits as a result of The Organization's management role (e.g., management costs and value-added opportunities).
- Determine the need for participatory mapping and impact assessment in cooperation with the affected rights holder

STEP 3: Participatory Mapping and Assessments

Elements of Step 3

3.1 Ensure sufficient community capacity for mapping and assessments

- Review the Process Agreement for expectations on mapping and assessments, including Required/requested scale of maps for mapping and assessment purposes.
- Support the building of community readiness, including Encouraging the rights holder to identify individuals to carry out the mapping/assessments; and Making resources available where they do not already exist.
- Recognize community mapping is an iterative and living process that will evolve

3.2 Participatory mapping

- Consider using 'works in progress' on mapping and assessments (for other sectors of development or governance purposes) on lands and territories proposed for development in the FSC process
- Make available a mechanism to enable the inclusion of all new information in maps and assessment reports as it becomes available
- Prepare a map or alternative overview showing all claims and land usage, all HCVs relevant to the affected rights holder, and the rights of the identified communities

- Acknowledge cumulative development impacts on the rights holder, their lands, resources, and territories

3.3 Disputes between affected rights holders

- Develop an understanding of the land stewardship responsibilities of the affected rights holder.
- Consider making dispute resolution support available for the affected rights holder.
- Review dispute resolution mechanisms agreed to in the Process Agreement.
- Acknowledge the ability of rights holders to seek resolutions independently.
- Consider mapping 'use zones', 'shared use areas', 'common areas', etc. rather than boundaries in the context of property rights.
- Observe and record boundary discrepancies for audits.
- Refer to claims identified as a preliminary baseline and refine when new information becomes available.
- Document informed objections to the FPIC process and planned forest activity.
- Investigate the nature and scope of the dispute and the role of forest activities in the dispute.

3.4 Engage in participatory impact assessments

- Determine whether the affected rights holder has protocols, laws and policies that address forest management.
- Respecting the legal boundaries of confidentiality, discuss the economic, social and environmental values of the forest resources extracted through management activities.
- Consider requirements for HCVs in Principle 9.

STEP 4: Inform Affected Rights Holders

Elements of Step 4

4.1 Proposed management activities are revised, and the affected rights holder is informed

- Revise management activities and adapt the draft management plan; in some cases, this may be integrated with participatory mapping and impact assessments.
- Consider how requirements under Principles 2 and 5 may fulfil some of the needs and concerns of the affected rights holder.

4.2 The affected rights holder decides on further negotiations

- Ensure all members of the certification team understand the benefit of culturally appropriate engagement with affected rights holders in all aspects of FSC P&C implementation.
  - Present draft final proposal for consideration and negotiation towards a final FPIC agreement.
  - Acknowledge and support the affected rights holder's decision-making process.

- If the affected rights holder decides not to engage in further negotiations, The Organization may attempt to:
  - Understand the risks of proceeding with proposed activities affecting their rights, resources, lands, or territories,
  - Modify or postpone activities to avoid any impacts on their rights, and/or
  - Continue engagement with the affected rights holder.

STEP 5: Prepare for Rights Holder Deliberations on the FPIC Agreement

Elements of Step 5

5.1 Determine the readiness of all parties to enter negotiations

- Review all parties' obligations and targets established through the Process Agreement.
- Verify The Organization's understanding of the affected rights holder's decision-making process (i.e., who has authority to represent and conclude negotiations).
- Ensure negotiators are fully resourced to enter negotiations with the affected rights holder.
- Document the fulfilment of benchmarks of community capacity readiness

5.2 Negotiate mitigation, compensation, restoration and benefit sharing

- Do not rush negotiations and ensure the Process Agreement is implemented. Take the time needed to negotiate in good faith and to the satisfaction of those affected.
- Confirm the process by which representatives will conclude the negotiation process.
- Ensure there is a complete set of records for the negotiation process (e.g., meeting minutes); these documents may be co-developed.

5.3 Establish arrangements for resolving disputes

- Review established dispute resolution process included in the Process Agreement
- Provide the affected rights holder with a reliable contact who is available and able to communicate in their preferred language and format.
- Schedule regular meetings with the affected rights holder so that individuals or the community can raise their concerns.

5.4 Set up a participatory monitoring process

- Identify and communicate to the affected rights holder who within The Organization will be responsible for monitoring the FPIC agreement.
- Distinguish between monitoring established in the Process Agreement and monitoring the implementation of the FPIC Agreement.

5.5 The affected rights holder adopts a decision regarding proposed management activities

- Ensure that time and resources are available for the affected rights holder to decide according to their internal decision-making process

STEP 6: Verify and Formalize the FPIC Agreement

Elements of Step 6

6.1 Consider using a third-party verification mechanism

- Discuss the use of independent verification with the affected rights holder, particularly in complex operating environments. Mutual agreement is an essential provision for the engagement of an independent observer.
- Document and share independent verification results with the affected rights holder as per the Process Agreement.
- Work to reach mutual agreement on the content and format of the FPIC Agreement.

6.2 Formalize the FPIC Agreement

- Maintain appropriate records of all agreements, including written accounts and audio or film records. Make records available to the parties of the agreement in their preferred language and media formats.

STEP 7: Implement and Monitor the FPIC Agreement

Element of Step 7

7.1 Implement and jointly monitor the FPIC agreement

- Ensure monitoring is participatory and focuses on whether the FPIC Agreement and the associated management plans are being implemented as agreed.
- Monitor the FPIC Agreement and make records available to all parties to the Agreement.
- Maintain relationships in good faith, understanding that at any time an affected rights holder may give reason for withdrawing consent, thereby triggering the dispute resolution process.

CULTURALLY APPROPRIATE ENGAGEMENT

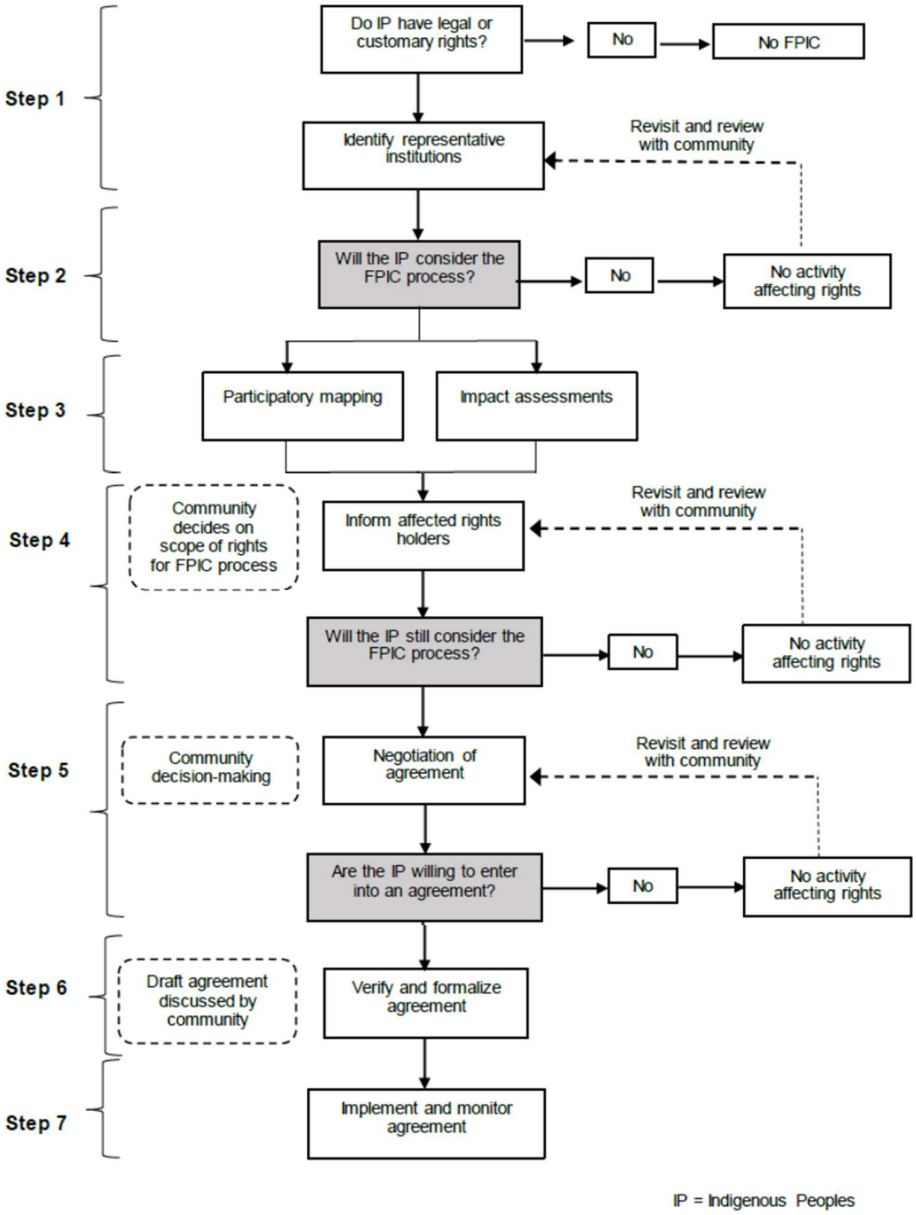
The phrase ‘culturally appropriate’ is defined in the FSC Glossary of Terms and used throughout the FSC P&C and IGIs concerning the design and implementation of dispute resolution and engagement processes with workers, stakeholders and rights holders. It is a concept closely aligned with all elements of the FPIC process.

Culturally appropriate processes consider cultural differences, such as:

- Preferences for direct or indirect negotiation;
- Attitudes towards competition, cooperation, and disputes;
- Desire to preserve relationships among complainants;
- Authority, social rank, and status;
- Ways of understanding and interpreting the world;
- Concepts of time and time management;
- local belief system and worldviews, e.g., ceremony and spirituality;

- Attitudes towards third parties, and
- The broader social and institutional environment in which management activities occur.

AN FPIC PROCESS DIAGRAMM



6.9. Local Government

Plantation operations managed by TNPL are located across local government areas in some of the areas. TNPL will have interaction with local government authorities and strives to proactively build relationships with them through communication and interaction.

6.10. Access and Security

Individual properties are generally monitored by the field supervisors and officers. TNPL staffs and representatives on behalf of TNPL have the rights to visit and assess the plantations raised under TNPL Plantations scheme. Staff and contractors are aware of their responsibilities regarding access and security of FMUs.

6.11. Design and layout of the Plantations

TNPL plantations are raised with suitable design and layout to meet out its pulpwood requirement. The design and layout of the plantations are prepared by considering the site conditions, species selected and its diversity, presence of streamside zones/buffer zones or wildlife corridors if any, rotation & harvesting, scale of operations and landscapes. However, TNPL plantations are not having any wildlife corridors in their plantations areas that also considered while preparing layout and design for establishing its plantations. Through this well systematic design and layout, TNPL not only increase the pulpwood plantations outside the natural forest areas and also reduce the pressure on natural forest which ultimately protect, restore and conserve the natural forest.

6.12. Representative sample

Since the TNPL plantations are established in the degraded and dry /irrigated land belongs to farmers, institutions and government, the presence of diversified vegetation (ecosystem) is not witnessed as in natural forests. Further, the natural forests, key biological areas, ecosystem are comes under ownership of state and central government which will not be allotted to anyone to raise any plantations and conserved without any disturbances.

However, TNPL is maintaining the representative sample in their natural state in its captive plantations areas to protect in their natural state. By this representative sample, the native state of captive plantations area are protected and maintained which also will be a tool to know the positive impact of TNPL plantation activities in that area. This representative samples area are selected based on the scale and intensity of operations and uniqueness of the natural state. Representative samples are also maintained to compare between natural state and after development of pulpwood plantation of that areas.

TNPL also utilizing its knowledge acquired through environmental organizations, local government officials and scientific authorities to maintain and protect the representative sample in its natural state within the plantation areas.

6.13. Conservation Zones / Buffer Zones

TNPL captive plantations are established in the degraded and dry land belongs to farmers, institutions and government, hence the presence of diversified vegetation (ecosystem) is not witnessed as in natural forests. Similarly, the conservation importance zones are not comes where the farmers plantations raised under Patta land. Further, the natural forests, key biological areas, ecosystem are comes under ownership of state and central government which will not be allotted to anyone to raise any plantations and conserved without any disturbances. So there will not be any ecosystem conservation zones in TNPL plantation areas except buffer zones/habitat conservation zones in few Captive plantations. Further, the grey slender loris habitat has been found in nearby TNPL Unit II Captive Plantation areas which is documented and protected. TNPL has taken remarkable protective measures to protect this habitat. The IUCN Red List of Threatened Species puts them as least concern, which means they are doing well. TNPL protecting the grey slender loris which are present in the TNPL Unit II Plantation areas through proper protective measures such as planting more habitat trees, avoiding disturbances of habitats and creating awareness among the public. The areas of slender loris habitat trees present in the Unit-II are demarked as **Conservation Zones** and they are well protected without any disturbances.

TNPL maintain the buffer zone in the channel bank or pond or nearby forest area if any i.e., **"No Development Area".** The plantations will be raised with a required distance (minimum 10 m width) from water channel or pond in which no plantation activities will be taken up and protect the buffer zone in its natural state. By maintaining and protecting the buffer zone if any, TNPL ensures the watercourses like channel bank or pond or nearby forest area if any are not affected by TNPL captive plantation activities. The buffer zone if any of captive plantations will be GPS mapped and maintained without any disturbances. Hence, TNPL is taking all effort to maintain the ecological balance of an area and the same is evidenced in its operating areas.

6.14. RIL guidelines while harvesting areas adjoin to conservation zones/buffer zones

Reduced impact logging (RIL) is the intensively planned and carefully controlled implementation of pulpwood harvesting operations to minimize environmental impacts on plantations areas and soils. The RIL concept may be followed in the areas which are nearer to conservation zones/buffer zones to avoid damage or negative impact on them. The following RIL guidelines to be followed while harvesting the pulpwood nearer to conservation zones/buffer zones:

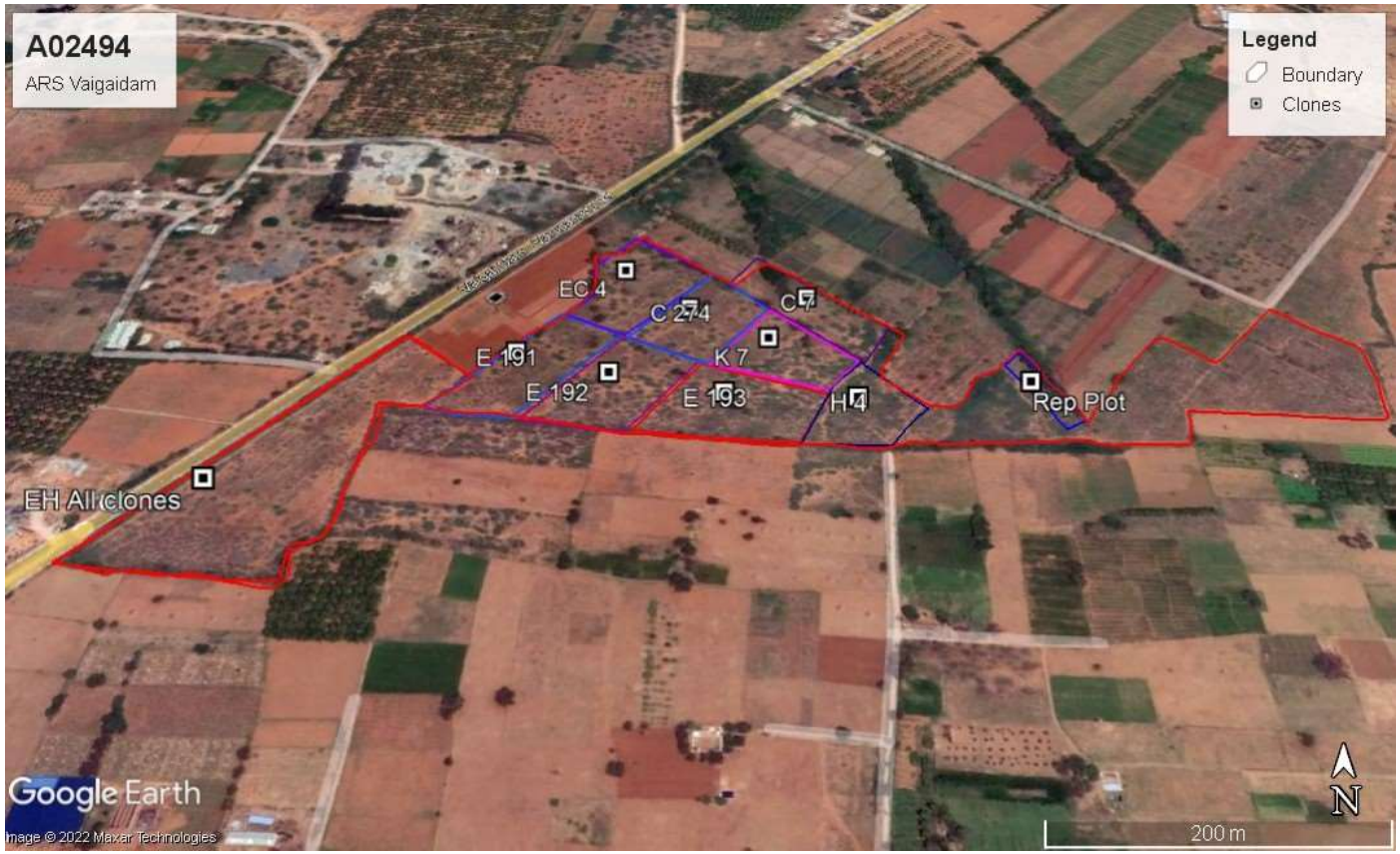
- Preharvest inspection of harvesting area and conservation/buffer zones
- Marking and Location mapping of the trees to be harvested nearer to conservation zones
- Removal of side branches/climbers if any
- Planning the felling direction to avoid damage on conservation zones
- Logs to be placed on landings of minimal size
- Harvesting operations should only be conducted under favorable conditions (e.g. when soils are dry, Favorable wind conditions)
- Well trained labourers to be engaged for harvesting the plantations
- Post harvest assessment to be done in harvesting area and conservation/buffer zones

6.15. Chain of Custody

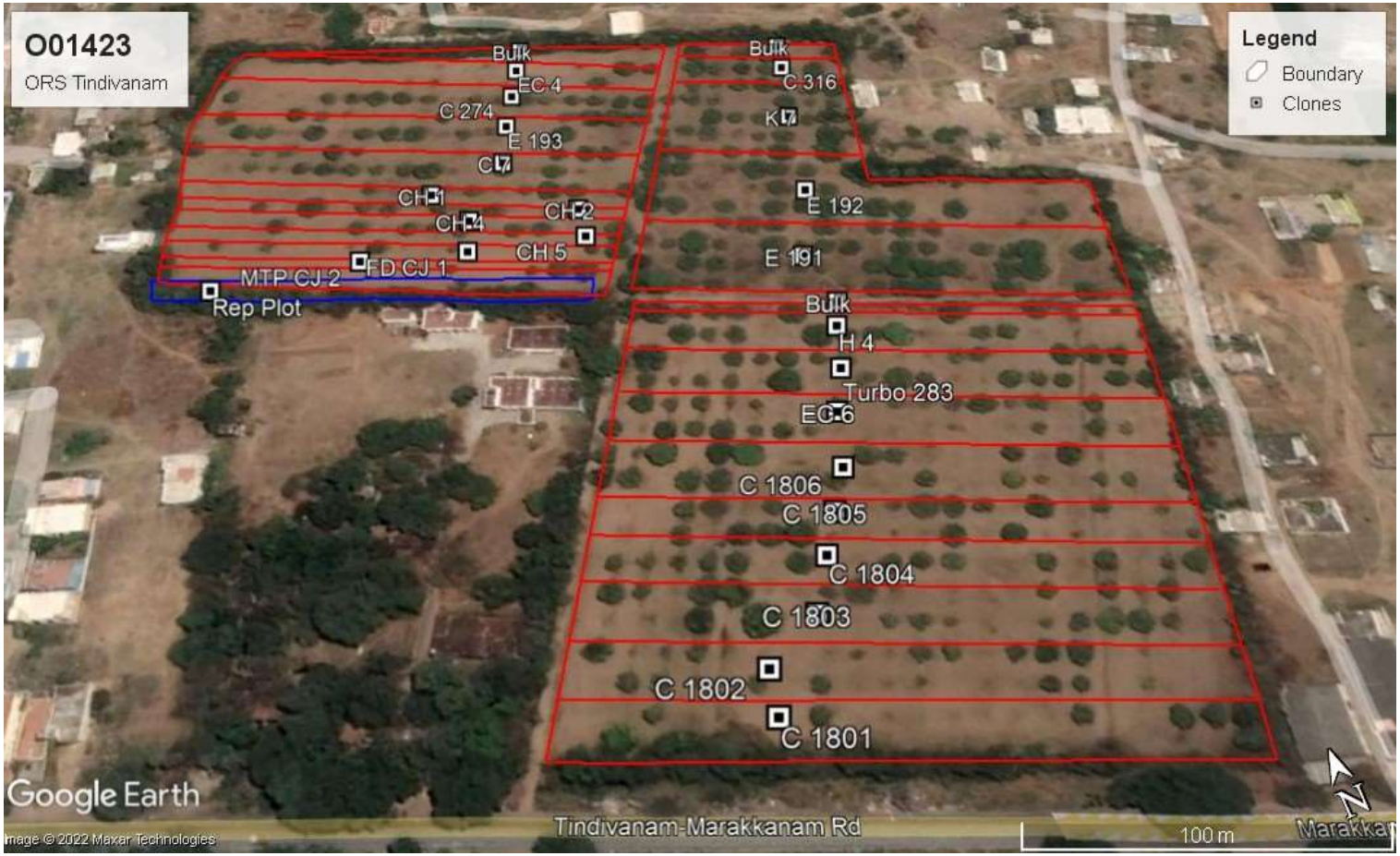
TNPL ensures that identification & segregation of FSC 100% material from the FMUs by the provision of appropriate documentation. To achieve this TNPL maintains policies and procedures that demonstrate control of the forest products up to the point of mill gate. The TNPL FM-COC manual explain chain link of pulpwood brought from field and making into pulp.

Sample Lay Out and Maps of Captive Plantations

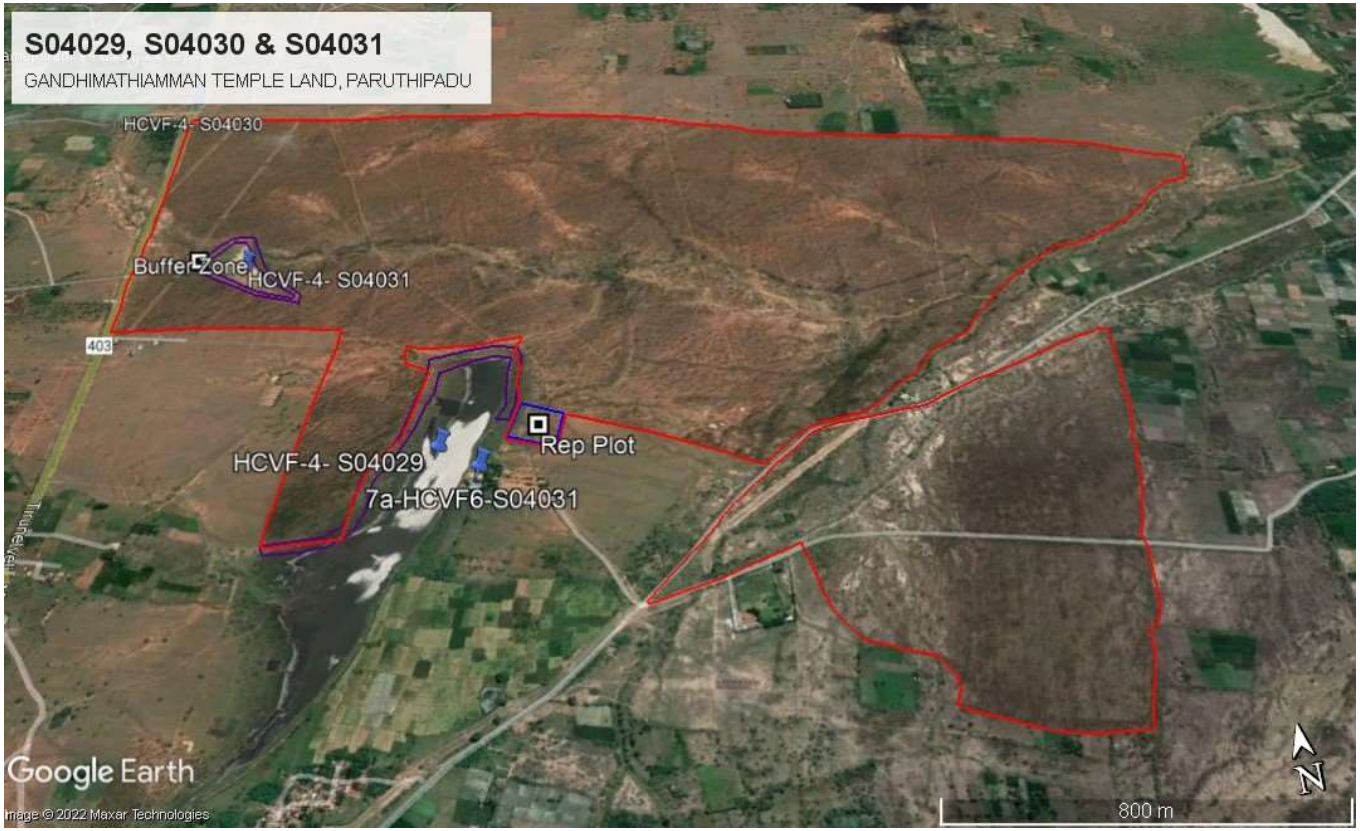
A02494 – ARS Vaigaidam Land



O01423 Oilseed Research Station Land, Tindivanam



S04029, S04030 & S04031 Gandhimathiamman Temple Land, Paruthipadu



D02484 – Dryland ARS, Kanadukathan

7.0. CORPORATE GOALS

TNPL's commitment to the Corporate Goals stated herein as, "successful implementation of plantation management system to meet the pulp wood requirement and also meets the Forest Stewardship Council®, Forest Stewardship Standard for India : FSC-STD-IND-01-2022 EN for Assessing Forest Management in India, are subjected to periodic external audits".
TNPL has developed a management system to demonstrate its commitment to the following:

- Sustainable Plantation Management
- Environmental Protection
- Social Responsibility

7.1 Goal: Sustainable Plantation Management

Objective: TNPL undertakes plantation management in a manner which will maintain or enhance the productive capacity of the land.

7.1.1. Soil Conservation Practices

The following activities are planned to manage the sites towards plantation establishment and conservation of soil & water.

Bush clearing and land development activities:

Since most of the sites taken for Plantation are degraded or barren land, these sites mostly not having any bushes and it may be sometime covered with unwanted bushes and thorny shrubs. These bushes are having shallow root system only. These unwanted bushes will be removed with utmost care not to create any soil degradation.
Low weight tractors and labourers are used to carry out soil working in TNPL captive plantation areas which will not have any adverse effect on soil. The following soil working activities will be carried out.

Disc ploughing:

The whole area will be ploughed with disc plough or sub-soilers. This type of soil working is good for areas with flat to gentle slope and in grassy locality, which will help in loosening of soil, collects maximum rain water and allows the water to percolate in the subsoil and thereby controls the runoff and soil erosion.

Compartmental/Contour Bunding and Boundary trenching:

Contour bunding will be carried out in the sloppy land and make compartments within the field to avoid runoff and soil erosion and collect the rain water with in the field. This will ensure better success rate of plantation by means of providing good root zone and highest

water penetration rate. In case of plain land boundary trenches are to be taken to control cattle damage and to act as micro water harvesting structures.

Soil reclamation

In the case of Saline and Alkaline soil, ploughing, sowing green manure crop and incorporation into the soil are highly recommended. If the land is having waterlogging problem, drainage channels are to be provided. The plantations raised by TNPL are improving the soil organic content and also improves the biological activity in the soil.

Based on the above, it is confirmed that the plantation activities carried out by TNPL doesn't result in soil degradation which in turn improves or enhances the soil in terms of structure, fertility and biological activity.

7.1.2. Species Selection

Plantation species are generally chosen on the basis of their site suitability, potential for high sustainable growth rates, and prevailing market opportunities for products. Plantation species which may come under the management of TNPL primarily include Eucalyptus spp and Casuarina spp and some alternate pulpwood species like Melia, Sissoo, Acacia etc.,

In India, the Eucalyptus and Casuarina species were introduced during 19th century itself. Even though these species were introduced to India, now they became naturalized to Indian conditions and become as local species in India. These species are comparatively better in adoptability, growth and productivity than native species of India under the prevailing eco-climatic conditions.

Since these species are naturalized to Indian conditions, there will not be any unusual mortality, disease or insect outbreaks in its plantation areas. The eucalyptus clones used for TNPL plantation schemes are gall resistant clones which prevent the gall infections. Though these pulpwood species doesn't have any unique pest and disease outbreaks, TNPL is having its own pest and disease prevent mechanism. TNPL also periodically monitoring its captive plantations to check whether is there any unusual mortality, pest & disease outbreaks and spontaneous regeneration within or outside plantation areas.

TNPL conducted various research multi locations trails (MLT) on pulpwood species/clones before including in plantation implementation plan. Based on these trails and experience in research field, it is confirmed that the exotic pulpwood species promoted by TNPL are ecologically well adapted to the site and not having any invasive characteristics. Generally, the pulpwood species promoted by TNPL are harvested in vegetative stage itself i.e., 3 years for Casuarina/Melia and 5 years for Eucalyptus and other species. So there will not be seed setting in the TNPL plantations. Due to these facts, the species used in TNPL plantation programme are not invasive, not having significant negative ecological impacts on other ecosystems and there will not be any spontaneous regeneration within or outside

plantation areas. So the pulpwood species promoted or planted by TNPL are doesn't have any adverse effect on environment.

Strategy for controlling invasive plant introductions:

TNPL is always having higher concern about the environmental protection and social welfare of the community. So any species which are invasive in nature are not used by TNPL in its plantation programmes. TNPL also introduced any pulpwood species in its plantation implementation plan after they tested in multi-location trials in various aspects like ecologically well adapted to the site, not having any invasive characteristics and productivity, etc., Hence, not using the invasive nature species in TNPL plantation programmes is the strategy followed by TNPL.
The general description of the pulpwood species used in TNPL plantation programme are as follows,

Species	Description	Avg. Pulp yield (%)	Rotation
Eucalyptus	Eucalyptus is a fast growing, medium- sized to tall tree attaining 20-50m in height and upto 2m in diameter and strongly coppicing tree possessing a wide range of soil and climatic adaptability. Basically a light demander, the growth of the species is very much reduced under shade. Eucalyptus is known for its drought hardiness, although annual rainfall of 800 mm is preferred. The species is also moderately salt tolerant and relatively fire resistant & grows under a wide range of climatic/soil conditions from warm to hot, sub humid to humid and from good to degraded soils.	45.0	5 years

Species	Description	Avg. Pulp yield (%)	Rotation
Casuarina	Casuarina is a fast growing, light demanding species. It is very sensitive to excess soil moisture, fire and frost. It comes very well under well drained sandy soil and grows poorly in heavy soils and does not tolerate clay. It is very sensitive to drought. On the coast it survives a long dry season, but this apparently due to the high water table in those areas. In general it does not coppice. Rare instances of natural regeneration and root suckers are noticed. It improves soil fertility by virtue of its vigorous root nodulation with nitrifying bacteria.	47.0	3 years

Dalbergia sissoo	D. sissoo is a native sp., medium to large deciduous tree with a light crown and can grow up to a maximum of 25 m in height and 20 to 30 cm in diameter. It can withstand average annual rainfall up to 2,000 millimeters (79 in) and droughts of 3–4 months. Soils range from pure sand and gravel to rich alluvium of river banks; shisham can grow in slightly saline soils.	48.0	5 years
Gmelina arborea	It is a native species which is also a light demander. It tolerates high temperature of the tropics and grows best where the rainfall is between 1000 to 3000 mm. It grows well in loamy soils, clayey loam and sandy loam.	51.0	5 years
A. mangium hybrid	*Acacia mangium* hybrid is a major plantation species in the humid tropical area. It can also tolerate a minimum annual rainfall of 1000 mm. It's having extremely vigorous growth rate and very well adapted to a wide *range of soils and environmental conditions. It grows rapidly in sites with low levels of soil nutrients, even on acidic soils and degraded sites and suits well in coastal belt of Tamil Nadu.*	52.0	5 years
Melia dubia	*Melia dubia is light demander and come very well under moist deciduous region. It grows on variety of soils. However deep a fertile sandy loam soil shows optimum growth, while shallow gravelly soils shows stunt growth. It's having a highest rate of growth and will attain 20m of height with a spreading crown and a cylindrical straight pole of 9 m length and 1.2 – 1.5 m girth. It coppices well and produce root suckers when the roots are injured.*	51.8	3 years

7.1.3. Silvicultural And Management System

TNPL aim is to maximise the productive potential and value of the plantation whilst maintaining and/or enhancing the sustainability and environmental values of the land and socioeconomic status the community who depended on plantations.

The selection of appropriate silvicultural system and species requires the consideration of a number of factors. These include but are not limited to site environmental factors, natural and cultural values, longterm property objectives, operational constraints, certification requirements and community expectations.

The following silvicultural system will be adopted for plantation management.

Species	Silvicultural system	Description
Eucalyptus	Simple coppice System	The Simple Coppice System consists in clear felling a fixed area annually, and regenerated by coppiceshoots. The best season for coppicing is a little before the growth starts in spring because, at this time, there is a large reserve of food material in roots, which is utilized by the coppice shoots. The stumps should be neither be too low or high. The first thinning is usually carried out in the second year and in this the number of shoots is reduced one to two per stool; the operation being known as the singling out operation.
Casuarina	Clear-felling system	The Clear-felling system is defined as a silvicultural system in which equal or equi-productive areas of mature crop are successively clear-felled in one operation to be regenerated, most frequently, artificially but sometimes naturally also. The clear-felled coupes will regenerated by planting of clones. After planting the tending operations like Thinning, Pruning, Nutrient application and Pest and Disease management, etc., will be carried out for better growth of plantation.
D. sissoo	Simple coppice System	The Simple Coppice System consists in clear felling a fixed area annually, and regenerated by coppice shoots. The stumps should be neither be too low or high. The first thinning is usually carried out in the second year and in this the number of shoots is reduced only to one per stool; the operation being known as the singling out operation.

Species	Silvicultural system	Descriptions
Gmelina spp	Simple Coppice System	The Simple Coppice System consists in clear felling a fixed area annually, and regenerated by coppiceshoots. The best season for coppicing is a little before the growth starts in spring because, at this time, there is a large reserve of food material in roots, which is utilized by the coppice shoots. The stumps should be neither be too low or high. The first thinning is usually carried out in the second year and in this the number of shoots is reduced only to one per stool; the operation being known as the singling out operation.
A. mangium hybrid	Clear-felling system	The Clear-felling system is defined as a silvicultural system in which equal or equi-productive areas of mature crop are successively clear-felled in one operation to be regenerated, most frequently, artificially but sometimes naturally also. The clear-felled coupes will regenerated by planting ofseedlings or clones. After planting the tending operations like Thinning, Pruning, Nutrient application and Pest and Disease management, etc., will be carried out for better growth of plantation.
Melia dubia	Simple Coppice System	The Simple Coppice System consists in clear felling a fixed area annually, and regenerated by coppiceshoots. The stumps should be neither be too low or high. The first thinning is usually carried out in the second year and in this the number of shoots is reduced only to one per stool; the operation being known as the singling out operation.

7.1.4 Plantation Establishment And Maintenance Plan

Activities to be followed for establishment & management of pulpwood plantation:

Eucalyptus spp.:

Plan of activities	Activities to be followed
Selection of Clones	- Site specific clones based on soil analysis
Site development	- Bush clearing, Disc ploughing or deep ripping on compact sites and compartmental bunding
Espacement	- 3mx1.35m

Planting Season	- June to October
Pit size	- 45 cm x 45 cm x45 cm
Manuring	- 250g of Vermicompost or Farmyard manure per pit
Irrigation	- Protective irrigation is essential, in case of monsoon failure. Drip irrigation may provide for irrigated sites
Ploughing	- One cultivator ploughing at the end of November - Disc ploughing during the month of February
Weeding	- 1 hand weeding and soil working after ploughing
Nutrient management	- Application of 500 grams of MLSS per plant
Singling out	- Singling of multiple shoots, by retaining 1 or 2 at each plant in terms of coppiced area after 6 months
Causality replacement	- Causality replacement within one month after planting
II year maintenance	- One Disc ploughing during the pre-monsoon period and one cultivator ploughing at the end of the rainy season - Hand weeding and soil working - Application of 500 grams of MLSS per plant
III year maintenance	- Two Disc ploughing - Application of 500 grams of MLSS per plant
IV year maintenance	- Two Disc ploughing
V year maintenance	- One Disc ploughing based on plantation growth
Intercropping	
a.Rainfed	- Sowing of Green Manure crop seeds (Kolunji, Sanappai & Thakkaipoondu) @ 20 kg per Ha to boost soil nutrient status and also to control weeds
b.Irrigated area	- Agricultural crops like Sunflower, Tomato, Ground nut, etc., as intercrop during the first 2 years.

Casuarina spp.:

Plan of activities	Activities to be followed
Selection of Clones/Seedlings	- Site specific Clones/Seedlings based on soil analysis
Site development	- Bush clearing, Disc ploughing or deep ripping on compact sites / cultivator ploughing for felled sites and land levelling
Espacement	- 1.5m X 1.5m
Planting Season	- June to September & Dec to Jan

Pit size	- 30 cm x 30 cm x30 cm
Manuring	- 250g of Vermicompost or 500g FYM per pit
Irrigation	- For once in every 10-15 days or Drip irrigation
Ploughing	- One rotavator ploughing to suppress weed growth
Weeding	- 1 hand weeding and soil working after ploughing
Nutrient management	- 250g of Vermicompost or 500g FYM per pit - Application of 500 grams of MLSS per plant
Causality replacement	- Causality replacement within one month after planting
Pruning	- Branches are pruned flush to the stem of up to 1/3rd of the stem height
II year maintenance	- Branches are pruned flush to the stem of up to 1/3rd of the stem height - Application of 500 grams of MLSS per plant
III year maintenance	- Application of 2 grams of MLSS per plant
Intercropping	- Agricultural crops like Sesame, Ground nut, etc., can be cultivated as intercrop during the first year

Dalbergia sissoo:

Plan of activities	Activities to be followed
Selection of Clones	- Site specific clones based on soil analysis
Site development	- Bush clearing, Disc ploughing or deep ripping on compact sites and land leveling
Espacement	- 3 X 1.35m -
Planting Season	- June to Oct
Pit size	- 45 cm x 45 cm x45 cm
Manuring	- 250g of Vermicompost or Farmyard manure per pit
Irrigation	- Irrigation is very essential and needed frequently.
Ploughing	- One cultivator ploughing at the end of November - Disc ploughing during the month of February
Weeding	- 2 hand weeding and soil working after cultivar ploughing

Nutrient management	- 250g of Vermicompost or 500g FYM per pit - Application of 500 grams of MLSS per plant
Causality replacement	- Causality replacement within one month after planting
II year maintenance	- One Disc ploughing during the pre-monsoon period and
	one cultivator ploughing at the end of the rainy season - Hand weeding and soil working - Application of 500 grams of MLSS per plant
III year maintenance	- Two Disc ploughing - Application of 250 grams of MLSS per plant
IV year maintenance	- Two Disc ploughing
V year maintenance	- One Disc ploughing based on plantation growth
Intercropping	- Agriculture crops like horsegram, blackgram, groundnut, etc., can be cultivated as intercrop during first 2 years.

Gmelina arborea:

Plan of activities	Activities to be followed
Selection of Clones	- Site specific Clones based on soil analysis
Site development	- Bush clearing, Disc ploughing or deep ripping on compact sites and land leveling
Espacement	- 3 m x 1.5 m
Planting Season	- Should be done during rains when the moisture is available at depths of 12"
Pit size	- 30 cm x 30 cm x30 cm
Manuring	- 250g of Vermicompost or 500g FYM per pit
Irrigation	- For once in every 10-15 days initially
Ploughing	- One rotavator ploughing to suppress weed growth
Weeding	- 2 hand weeding and soil working after ploughing
Nutrient management	- 250g of Vermicompost or 500g FYM per pit - Application of 500 grams of MLSS per plant
Singling out	- Singling of multiple shoots, by retaining 1 or 2 at each plant in terms of coppiced area after 6 months of planting
Causality replacement	- Causality replacement within one month after planting
II year maintenance	- Branches are pruned flush to the stem of up to 2/3rd of the bole - Application of 500 grams of MLSS per plant
III year maintenance	- Application of 250 grams of MLSS per plant
IV year maintenance	- Two Disc ploughing
V year maintenance	- One Disc ploughing based on plantation growth

Acacia mangium hybrid:

Plan of activities	Activities to be followed
Selection of Clones	- Site specific clones based on soil analysis
Site development	- Bush clearing, Disc ploughing or deep ripping on compact sites and land leveling
Espacement	- 3 X 1.35 m
Planting Season	- June to August
Pit size	- 45 cm x 45 cm x45 cm
Manuring	- 250g of Vermicompost or FYM per pit
Irrigation	- Irrigation is very essential and needed frequently and Drip irrigation also may provide
Ploughing	- One cultivator ploughing at the end of November - Disc ploughing during the month of February
Weeding	- 2 hand weeding and soil working after cultivar ploughing
Nutrient management	- 250g of Vermicompost or 500g FYM per pit - Application of 500 grams of MLSS per plant
Causality replacement	- Causality replacement within one month after planting
II year maintenance	- One Pruning should be done up to 2–3 m height - One Disc ploughing during the pre-monsoon period and one cultivator ploughing at the end of the rainy season - One Hand weeding and soil working - Application of 500 grams of MLSS per plant
III year maintenance	- One Pruning should be done up to 5-6 m height - Two Disc ploughing - Application of 250 grams of MLSS per plant
IV year maintenance	- Two Disc ploughing
V year maintenance	- One Disc ploughing based on plantation growth
Intercropping	- Agricultural crops like green beans, horsegram, blackgram etc., as intercrop for the first 2 years.

Melia dubia:

Plan of activities	Activities to be followed
Selection of Clones	- Site specific clones based on soil analysis
Site development	- Bush clearing, Disc ploughing or deep ripping on compact sites and land leveling
Espacement	- 3 X 1.5 m
Planting Season	- June to August

Pit size	- 45 cm x 45 cm x45 cm
Manuring	- 250g of Vermicompost or Farmyard manure per pit
Irrigation	- For once in every 10-15 days
Ploughing	- One Disc ploughing and one cultivator ploughing
Weeding	- 2 hand weeding and soil working after ploughing
Nutrient management	- Application of 500 grams of MLSS per plant
Singling out	- Singling of multiple shoots, by retaining 1 or 2 at each plant in terms of coppiced area after 6 months of planting
Causality replacement	- Causality replacement within one month after planting
II year maintenance	- One Disc ploughing during the pre-monsoon period and one cultivator ploughing at the end of the rainy season - Hand weeding and soil working - Application of 500 grams of MLSS per plant
III year maintenance	- Two Disc ploughing
Intercropping	- Agricultural crops like Turmeric, Ground nut, etc., can be cultivated as intercrop for the first two years.

7.1.5.a. Management Plan for Major Pests and Diseases of Pulp Wood Plantations

Integrated Pest Management Plan

The plantation programme with large scale monocultures of plantations will harbour wide range of pest and diseases. In certain cases, these pests may become a very big threat due to its epidemic nature. Hence Tamil Nadu News Prints and Papers Limited has established a elaborate pest management plan to monitor, identify and control the pests both at initial and established stages. The pest management plan is headed by an Entomologist assisted by Pathologist and a Silviculturist. The pest surveillance have been carried out once in a year atelase in all plantation areas besides TNPL has established prevention and control measures to control the pests through silviculture, biological, mechanical and lastly bio-chemical methods of control. Since the TNPL is involved in industrial plantation establishment programme during the last 17 years, it has identified the major pests and diseases and developed comprehensive control programme which are furnished below.

CROP	PEST & DISEASE	ETL	FAVOURABLE CONDITIONS	MANAGEMENT PLAN
EUCALYPTUS				
	1. Gall wasp *(Leptocybe invasa)* Outbreak of this pest on eucalypts plantations and nurseries was observed in India since 2007.	>25-30% leaves infested	Throughout the year mainly during April to October	1. Collection and destruction of infested leaves from the young seedlings control the spread of this pest. 2. Biological control of gall wasp using the natural enemies (parasitic wasp has already been imported from the ISRAEL by National Bureau of Agriculturally Important Insects – NBAII, Bangalore and is available for the management of gall wasp). 3. The development of gall tolerant clones is in progress in FC&RI,MTP. Once it is identified, it will be used for either breeding programmes or raising the clones. 4. The clonal material being used should be thoroughly checked for gall infestation before field planting. The highly susceptible clones should not be used. 5. The clones showing tolerance against the pest should be used in mixture. 6. Farmers, industries and forest department practicing clonal forestry should not establish clonal plantations of Eucalyptus merely with one

				or two clones instead such plantations should be established with a mixture of 10 to 15 clones to broaden the genetic base. As the adults of this insect get attracted to light, mercury vapour lamp hanging over a water trough or pit containing few drops of kerosene will prove helpful in killing the adults during emergence and check further egg-laying by the insect.
	2. Sucking pests Aphids, Thrips	2 insect /leaves	Dry weather conditions	1. Spray neem oil 0.5% (containing Azadiractin) effectively control the sucking pests. 2. Spraying of 2% soap solution can also control the aphid population.
	3. Foliar diseases (mostly in young seedlings and nurseries) *Cyindrocladium* leaf spot *Phaeoseptoria* leaf spot Leaf Rust (*Puccinia psidii*) *Alternaria* leaf spot *Cercospora* leaf spot	PDI>25	Throughout the year/serious after rainfall	1. The avoidance of overhead watering will reduce the incidence of the disease in young seedlings and nurseries. 2. Foliar spray with 0.5% *Pseudomonas fluorescens* TNAU Pf1 talc based formulation. 3. Foliar spray with 0.5% *Pseudomonas fluorescens* liquid formulation could effectively control the diseases.
	5. Stem diseases Pink disease (Corticium salmonicolor) Cankers (Cryphonectria, Coniothyrium)	PI >10	High (continuous) rainfall conditions	1. Application of Pseudomonas fluorescens talc based formulation @ 100 g / tree at the time of planting and at every 6 months or one year interval based on the intensity of the disease.

	6. Root diseases Woody root and stem rot / Gummosis (Armillaria, Ganoderma and Phellinus)	PI>10	Dry period following by summer shower or rainfall	1. Avoid injuries during pruning or cultural operations 2. The pruned or cut portions should be dressed with neem based fromulations 3. Application of talc based formulation of Pseudomonas fluorescens TNAU Pf1 @ 50 g/tree at the time of planting and at every 6 months or one year interval based on the intensity of the disease (before the onset of monsoon in case of dry conditions). 4. Application of VAM / Trichoderma viride TNAU TV1 @ 50 g / tree at the time of planting and at every 6 months or one year interval based on the intensity of the disease (before the onset of monsoon in case of dry conditions).
	7. Bacterial wilt : Ralstonia solanacearum Disease of both nursery and plantations	PI>10	High temperature (29-35ºC) favours pathogen growth and disease development.	1. Use only bacteria-free propagation material for planting 2. Provide good drainage facilities 3. Avoid root injuries during transplantation or other cultural operations. 4. Soil application of Pseudomonas fluorescens @ 50 g/ tree can reduce the population of bacterial wilt pathogen thereby reducing the disease incidence.

CASUARINA				
	Mealy bug (*Paracoccus marginatus)*	5 Nos/ branch	During summer seasons (Mar-Apr)	1. Removal and destruction of infested parts of the plant 2. Encourage the parasitoid activity and natural enemy population 3. Release of parasitoid viz., *Acerophagous papaya* (500 parasitoids in the hot areas) (available with the Department of Agricultural Entomology, Tamil Nadu Agricultural University as the mission was started to control this polyphagous pest) effectively control the mealy bug infestation. 4. Conservation of the released parasitoids and naturally occurring coccinellids by avoiding the use of chemical pesticides. 5. Use botanical insecticides like neem derivatives such as neem oil 2%, NSKE 5% and fish oil resin soap @ 25 g / litre of water.
	Bark eating caterpillar	>10% of plants infected	During summer seasons	1. Application of entomopathogenic fungi like *Beauveria bassiana, Metarhizzium* reduce the infestation.
	Termites Termites are important pest on nursery and young seedlings planted in the main field. They feed on underground rhizomes, roots and stem of forest tree species. Serious problem	Based on the severity /percent dead plants (>10%)	Throughout the year on red soil/serious problem during dry conditions	1. Addition of organic material to the soil Termites prefer to eat dead plant material. Their attacks are thought to be related to soils with low organic matter content. Thisis because such soils do not contain enough food for termites tolive and they resort to feeding on living plant material. Thus, addition of compost or well-rotted manure to the soil and sowing green manures helps to increase the organic matter in the soil. 2. Encourage predators Termites have many predators because they provide a source of protein. Insects that eat termites include spiders, beetles, flies, wasps and especially ants. Encouraging this kind of wildlife will help to reduce the number of termites. 3. Release of red ants collected from other fields could destroy the termites in nursery and young seedlings.

	in red soils and in poorly maintained gardens.			4. Mulching with items such as hay, manure, wood shavings, wood ash or threshed maize cobs dramatically decrease termite attacks. 5. Vetiver grass leaf mulch has been shown to prevent termite attack around the base of trees. 6. Plants which are suffering from disease or lack of water are generally more susceptible to termites than healthy plants. It is therefore important that plants are kept healthy. 7. Repeated digging and ploughing of the soil may reduce termite damage. Manual and explosive destruction of nests followed by the removal of the queen is also effective. 8. If the termites cause serious menace on grown up trees, it is better to whitewash/swab the tree with lime from earth surface to 3 feet uniformly.
	Blister disease or Stem wilt (Trichosporium vesiculosum)	PI>10	Dryweather conditions	1. Isolation of the trees by digging trenches 2. Removal and destruction of severely infected trees to reduce the source of inoculums 3. Application of bioinoculants such as Trichoderma viride, Pseudomonas fluorescens and VAM @ 50 g/tree.
MELIA DUBIA				
	Bacterial wilt : *Ralstonia solanacearum* Disease of both nursery and plantations	PI>10	High temperature (29-35ºC) favours pathogen growth and disease development.	• Use only bacteria-free propagation material for planting • Provide good drainage facilities • Avoid root injuries during transplantation or other cultural operations. • Soil application of *Pseudomonas fluorescens* @ 50 g/ tree can reduce the population of bacterial wilt pathogen therebyreducing the disease incidence. • Soil drenching with micromonospora @ 50 ml/ tree can effectively control bacterial wilt disease.

Pesticide Policy

"We, Tamil Nadu Newsprint and Papers Limited are committed to manage the captive plantations 100% by silviculture, organic pesticides or bio-control agents only and not by any chemical pesticides and maximum extent to Farmers Plantations" – TNPL's Pesticide Policy.

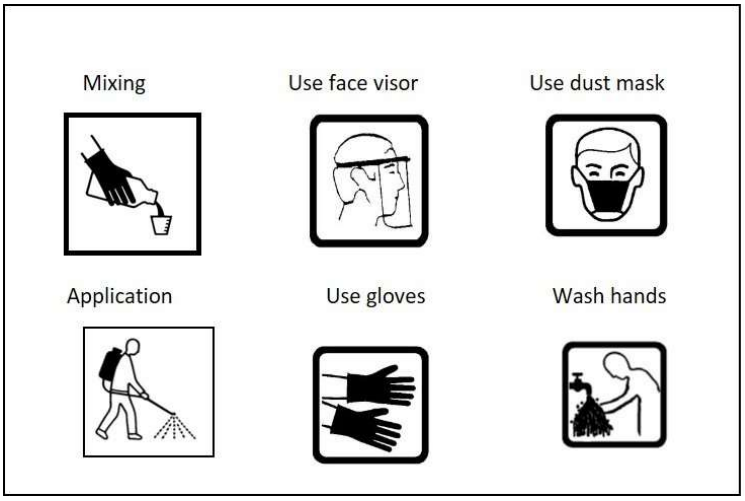
TNPL is not using or not recommending any pesticides or chemicals for its plantation activities. Hence, the application of ESRA as per FSC standards will not be applicable to TNPL Plantation Scheme".

TNPL is encouraging the farmers also for application of bio-pesticides to control the pest & disease incidence at field. However, TNPL is prepared a guidelines and safety procedure for application of pesticides and list of chemicals to be avoid which are hazardous to the applicator and the environment.

TNPL Pesticide Policy and Its Guidelines:

- The pesticides which are banned by FSC should not be used and only the least toxic pesticides should be used for control of pests
    - If less hazardous pesticides are to be used, the products and the application techniques must be selected carefully to avoid the impact on beneficial organisms, humans and the environment
- While selecting the pesticides the following points must be taken into account,
    - It should be effective in controlling the pest
    - It should be highly specific to the pest and does not significantly affect beneficial organisms
    - It should has a low human toxicity
- Spraying of pesticides should be done by skilled person and not by others
- Before using any crop protection product, always read the leaflet and label and make sure you understand all safety needs
- Check the spraying equipment whether it is in working conditions and there is no leakage before usage
- Should ensure only the recommended rate of pesticide for usage
- Should ensure there is no damage in the package before buying pesticides and buy only in the original packing and not in any other container
- Don't transport the pesticides along with food stuff
- Should keep the pesticides in proper place and keep under lock & key. Also it should keep in the place where it cannot be reached by children
- Don't keep the food stuffs near the site of application
- Should wear protective clothing as described in the label to avoid hazardous during applications
- Should prepare only the recommended and required quantity for immediate use
- Should use the stick for mixing of pesticides with water and mix it thoroughly

- Should use funnel for transfer of pesticides mixture into the sprayer to avoid spillage
- Don't drink or eat while pouring, mixing or spraying the pesticides
- Should spray the pesticides along with wind direction and minimum drift
- Should not spray the pesticides during high wind conditions
- To clear the blocked nozzles should use a soft bristle brush or compressed air and do not blow or suck the nozzles to clean them
- Should wash the mouth and hands with soap and water cleanly before eating or drinking
- Should take bath and clean the clothes after spraying of pesticides
- Should thoroughly clean all spraying equipments where the run-off will not create any hazard or contaminate the environment
- Should destroy the empty containers and it should not used for any other purposes especially to carry food or water
- Should have first aid kit that includes towel, clean clothing, soap, water at the site of application
- Should give first aid incase of any accidental poisoning and take him to hospital immediately. Also show the pesticide leaflet and container to the doctor for proper treatment
- In case of emergency you may call 108 for free ambulance service



7.1.5.b. The strategy to minimize or not using chemical pesticides/fertilizers:

In order to reduce or not using the chemical pesticides, the plantations are to be managed without any weeds and bushes which may be the reason for pest and disease infestations in plantations. Also the infected plants should be removed immediately to avoid the spreading of infestations. The suitable bio-control agents may be used to control pest and disease infestations. Using the pest and disease free clones for raising pulpwood plantations.

The strategy for achieving no use of chemical fertilizers to pulpwood plantations can be done

by two strategies viz. (1) effective use of soil nutrients and (2) exogenous application of relevant organic manures.

Effective use of soil nutrients

- ✓ Bio-fertilizers are the special formulation of specific beneficial microorganisms that promote the growth of plant crops by converting the unavailable form of soil nutrients into available form.
- ✓ These bio-fertilizers also induce rapid decomposition of organic residues inside the plantation in addition to increased pest and disease resistance in plants.
- ✓ Certain Bio-fertilizers have positive association with pulpwood plantations (Casuarina- VAM, Casuarina- frankia, Eucalyptus- Rhizobium, Melia- Rhizobium etc.) in improving the plant growth and development.
- ✓ In addition to this, N fixing bacteria, phosphorus solubilizing bacteria (PSB) and potassium solubilizing bacteria (KSB) are known better for increasing the availability of soil nutrients. Application of these bio-fertilizers along with organic manures improves the soil available nutritional status.
- ✓ Adopting right spacing of plantation will improve nutrient use efficiency and conserve the soil nutrients**.**

Exogenous plant nutrition

- ✓ The organic compost derived from farm wastes are applied @ 50 g/ plant as basal dose. This will improve the root development at initial stage of plant growth.
- ✓ Vermi- compost contains appreciable plants nutrients and hence soil application of vermi- compost to pulpwood plantations can eliminate the usage of chemical fertilizers.
- ✓ Weeding/ soil working/ interploughing in the pulpwood plantations assists for nutrient recycling as weed biomass and leaf litter fall is reincorporated into soil that contains essential plant nutrients.

Further, the following bio-pesticides and bio-fertilizers can be used to avoid the usage of chemical pesticides and fertilizers.

Biopesticides and Biofungicides

Bio pesticides are living organisms which can intervene the life cycle of insect pests in such a way that the crop damage is minimized. The agents employed as biopesticides are parasites, predators, fungi, bacteria and viruses which are natural enemies of pests. These bio agents can be conserved, preserved and multiplied under laboratory condition for field release.

Importance of Bio-pesticides

Bio pesticides are living organisms which can intervene the life cycle of insect pests in such a way that the crop damage is minimized. The agents employed as biopesticides, include

parasites, predators and disease causing fungi, bacteria and viruses, which are the natural enemies of pests. Further, they complement and supplement other methods of pest control. Utilization of naturally occurring parasites, predators and pathogens for pest control is a classical biological control. On the other hand, these bio agents can be conserved, preserved and multiplied under Laboratory condition for field release. Once these bio-agents are introduced in the field to build their population considerably, they are capable of bringing down the targeted pest' population below economic threshold level (ETL). However, the crux lies in their mass production and application at the appropriate time**.**

Major advantages of bio pesticides

Bio-pesticides are preferred over chemical pesticides for the following reasons:

- No harmful residues;
- Target specific and safe to beneficial organisms like pollinators, predators, parasites etc.;
- Growth of natural enemies of pests is not affected, thus reducing the pesticide application;
- Environmental friendly; cost effective;

Biofungicides

Biofungicides are an efficient microorganism that controls plant pathogenic fungi and bacteria. These are specific to the plant pathogens and are eco-friendly in nature. It also induces systemic resistance in crop plants.

Example : Pseudomonas florescence, Trichoderma viride , Trichoderma harzianu etc.,

Advantages:

1. It improves soil quality with subsequent uses.

2. It should not be mixed with antibacterial agents and inorganic fertilizers.

3. It effectively protects the plant from wilt, root rot, soft rot, blight and damping off effect.

Neem Based Products in Pest Control:

Neem kernel extract

Fifty grams of neem kernel are required for use in 1 litre of water. The neem kernel is pounded gently in such a way that no oil comes out. The outer coat is removed before pounding. This is used as manure. The seeds that are used for the preparation of neem kernel extract should be between three and eight months old. The pounded neem kernel powder is gathered in a muslin pouch and soaked overnight in water. The pouch is squeezed and the extract is filtered.

Neem leaf extract

For 5 litres of water, 1 kg of green neem leaf is required. The leaves are soaked overnight in water. The next day, they are ground and the extract is filtered. The extract is suited for use against leaf eating caterpillars, grubs, locusts and grasshoppers. The advantage of using neem leaf extract is that it is available throughout the year.

Neem Granules are used as a natural and environmental friendly fertilizer and manure. Neem Granules is the residue left after oil has been extracted from neem seeds or kernel. It has the highest azadirachtin content as compared to other parts of the neem tree.

Biolgical effects of Neem on insects:

1. Repellent
2. Insecticidal
3. Antibacterial
4. Antifungal
5. Feeding deterrent
6. Oviposition deterrent
7. Insect growth inhibiting
8. Nematicidal.

7.1.5.c. Management Plan for nutrient improvement in Pulp Wood Plantations

Fertilizer Policy

"We, Tamil Nadu Newsprint and Papers Limited are committed to manage the captive plantations 100% by organic fertilizers, bio-fertilizers only and not by any chemical fertilizers and maximum extent to Farmers Plantations" – TNPL's Fertilizer Policy.

Biofertilizers:

Biofertilizers are the special formulation of specific beneficial microorganisms that promote the growth of plant crops by converting the unavailable form of nutrients into available form. These biofertilizers also induce resistance in plants against pests.
Bio-fertilisers are living microorganisms of bacterial, fungal and algal origin. Their mode of action differs and can be applied alone or in combination.

Major advantage of Biofertilizers

Biofertilisers enhance the nutrient availability to crop plants (by processes like fixing atmosphere N or dissolving P present in the soil) ; and also impart better health to plants and soil thereby enhancing crop yields in a moderate way. It is a natural method without any problems like salinity and alkalinity, soil erosion etc..

Example: Azospirillum, Rhizobium, Phosphobacteria, VAM etc.,

Vermicompost

Vermicompost is earthworm compost for reclamation of soil and to enrich soil nutrient.

Advantages of earthworm compost

1. Earthworm compost boosts soil fertility, improving both the biological and physicochemical properties of the organic material.
2. It allows the utilization of essential nutrients from agricultural wastes in growing crops.
3. It aids the use of slow-release fertilizers, particularly its nitrogen content, which after one-third is used, becomes slow-release humic nitrogen.
4. It has a growth-promoting humic substance or phyto-hormone that accelerates root development.
5. It increases and diversifies the microbe phase, reducing pathological and pest incidence.
6. It minimizes nutrient loss as negatively charged organic material maintains and holds nutrients.
7. It produces humic substances (humates) with high buffering capacity for better soil management.
8. Promotes faster growth of plants, increases crop yield.
9. Produces crops with a better taste, and lasting quality, without toxic residues.
10. Improves groundwater recharge and reduces depletion of groundwater.
11. Reduces soil salinization and soil erosion.
12. Lessens pollution, as chemicals are not used.
13. Increases export of agricultural product with lower pesticide residues.
14. Lessens wasteland formation

7.1.5.d. Management strategy to minimize impacts of disease and pest outbreaks:

In order to minimize the impacts of disease and pest outbreaks, the following management strategy to be followed in TNPL plantations area:

- The infected plants should be removed immediately to avoid the spreading of infestations
- Pruning the infested branch of tree to avoid further spreading
- Using the suitable bio-pesticides or bio-control agents to control pest and disease infestations
- Ploughing the field in required time to avoid the disease infestations and for pest control.
- Using the pest and disease free clones for raising pulpwood plantations

7.1.6. Farm Road Construction Procedure & Guidelines:

Farm roads will be constructed for Plantations which are having more than 10 hectares if needed especially under Captive Plantation scheme. While constructing the farm road the numbers of factors leading to environmental & social impacts are to be taken into account and the roads are to be formed without affecting landscape, water source & soil. In this background, the guidelines are prepared by TNPL to ensure that the construction of farm roads in all phases are carried out in a manner that is compatible with environmental values and sustainable forest management.

Phases of Farm Road Construction:

Generally farm roads are formed on the existing roads / paths in plantations areas. Since at most care to be taken while forming the roads like without removal of the top soil, etc., the environmental impacts are almost zero. Proper care has been taken up in line with environmental values to form farm road with the following phases.

PHASE	AIM
Planning	Potential environmental risks if any and construction difficulties are identified at road planning stage to ensure and avoid negative environmental impacts
Design	The roads are to be designed with an objective to have approach to all the areas of the plantations covering boundaries and within the areas at specified intervals as per the requirement
Location	Roads should located in such a way that it minimise the risks to environmental values during all stages of formation and completion
Drainage	Even though the farm roads are formed with mud and stones, proper drainage facilities are to be provided to ensure the minimum runoff effect
Maintenance	Road surfaces are to be well maintained to minimise the environmental impact and ensure safety of the workers

Guidelines for Farm Road Construction:

1. The farm roads / approach roads are to be provided for the plantations which are more than 10 Ha if needed.
2. As far as possible, the existing path may be used as farm road and if it is not available, the points are to be marked at strategic locations for proper road formation during the time of land development
3. The field officers have to survey the land and mark the points for road formation wherever required
4. The road should be marked before ploughing and should keep the road path unploughed

5. If High Conservation Value trees (HCVF) or social and cultural important places are present on the border of the roads while marking, it should be kept intact
6. The minimum width of the road should be 3m and the length will vary based on the physiography of the land
7. Accurate measurements are needed when constructing a farm road to insure good drainage and low maintenance costs, and to minimize soil erosion
8. Dips are used for surface drainage of outsloped roads and for cross-drainage of crowned roads. On-site measurements of height and slope are needed in constructing dips
9. Depending on topographical location, soils, wetness and use, road surface may be insloped, outsloped or crowned to facilitate drainage. In any case, the side-to- side slope of the surface should be about 3 percent

7.1.7. Safety Guidelines

7.1.7.1. Fire safety

Since most of the plantations are established in degraded and dryland area there is no or minimal threat of fire. Eventhough the possibility of fire occurrence is very minimal Tamil Nadu Newsprints and Papers Limited have protected all the captive plantations through comprehensive insurance programme to mitigate the loss. The captive plantation programme have supervisors/watchers which are predominantly from the local community and their role is to keep watch on the occurrence of fire and to arrest with local resources available if any occurred. TNPL also working with Insurance agencies to framer policy works to include Farmers Plantations are also under Insurance Coverage.

Fire precautions

The captive plantation areas are introspected towards the occurrence of fire and it has been forecasted that the following types of fire may occur in the plantation areas.

Creeping fire: Creeping fire is a fire spreading slowly over the ground, usually with low flame. It occurs in forests that have no ground cover or undergrowth. The ground is usually covered with a layer or dry leaves which burn slowly in the absence of strong wind.

Ground fire: It is defined as a forest fire which burns the ground cover only (i.e., the carpet of herbaceous plants and low shrubs, which covers the soil).

Surface fire: This fire is defined as, 'a forest fire which burns not merely the ground cover but also the undergrowth vegetation. It occurs mostly in plain areas.

Crown fire: A forest fire that spreads through the crowns of trees and consumes all or part of the upper branches and foliage. Such fire generally occurs in forest of conifer na- ture. A severe damage is caused to the crowns of trees.

Expected damages due to fire

In case of fire occurrence the following damages are expected and forecasted.

- Damage to trees
- Damage to soil
- Damage to productivity of plantations
- Damage to recreational or aesthetic value

Preventive measures

Plan

A Comprehensive fire prevention and management plan is prepared specific to captive sites which can be adopted to Farmers plantations also. The prevention plan has the following measures.

- **Establishment of fire line or fire breaks:** Wherever a chance of fire a permanent fire line or fire breaks may be created all along the captive site area with the trenches.

- **Maintenance of fire breaks:** The fire line or fire breaks are need to be kept neat and free from any plant residues. The fire lines or fire breaks are cleaned before the summer to avoid fire in TNPL captive plantation areas.

- **Establishment of fire resistance live fences:** TNPL has identified the following species as fire resistant which act as a barrier and prevent the occurrence of fire. The green live fence may be created in the captive plantation site wherever required.
    - Agave americana
    - Agave sisalana
    - Morinda tinctoria
    - Erythroxylan monogyram
    - Protium cordatum
    - Opuntia spp.

Supervisor/Watchers

Where ever possible TNPL has a plan to deploy the local communities as a supervisor/watcher in order to assess and indicate the fire occurrence to the management unit and to take action to resolve the issues.

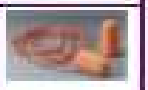
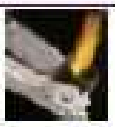
7.1.7.2.Safety Guidelines for Plantation Labour

- Child labours are strictly prohibited in the plantation development activities and felling areas
- First Aid boxes should be placed in planting as well as harvesting sites

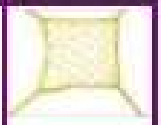
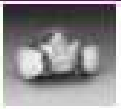
- If any persons attacked by snake or scorpion, they should take immediately to hospital after giving proper first aid
- If the person is attacked by snake bite, immediately tie with rope above the point of bite to arrest the spreading of poisons and take to hospital
- Proper care should be taken while using the tools in the plantation development activities / felling operations to avoid injuries
- If any Electricity lines (High Voltage lines) passed through the field, the power should be off through proper intimation to EB department officials before carrying out land development activities like removal of bushes, shrubs, etc.,
- If Electricity lines (High Voltage lines) passed through the field, minimum of 3 meters distance should be maintained on both sides of the lines without planting trees or else the trees to be maintained within permissible height which is not touching the electric wire at any occasion.
- Smoking is strictly prohibited in the plantations as well as felling areas
- Proper care should be taken while harvesting the plantations during windy period
- Labours should wear helmet and safety shoes while harvesting the plantations and also should be vigilance
- While using the power chain saw for harvesting the pulpwood, labours should wear helmet, eyeglass and shoes to avoid injuries
- In case of emergency you may call 108 for ambulance service and 101 for fire service which is given at free of cost

USAGE OF PERSONAL PROTECTIVE EQUIPMENTS (PPEs) AND SAFETY APPARATUS

Sl.No	TYPE OF PERSONAL PROTECTIVE EQUIPMENTS	PROTECTS AGAINST	USAGE AREAS	PICTURE OF PPE
01	Safety Helmet	Fall of objects, Hitting against objects etc.,	All working areas.	
02	Helmet (Basket Type) (Load carrying)	Fall of objects, Hitting against objects etc.,	Civil construction site while carry head load.	
03	Face Shield	Chemical splashing, striking of dust particles	Chemical handling areas in all sections and while taking samples as well as unloading of hazardous chemical from tankers.	
04	Welding shield	Eye Protection Against ultra violet rays	Arc welding area	
05	Panorama Goggles	Chemical / oil splashes	Hazardous chemical handling areas in all Sections	
06	Safety Goggles	Dust	CAP,CHP,Lime Godown,Bagasse yard,Pith Yard,Pulp Mill etc.,	
07	Grinding / Gas cutting Goggles	Flying metal particles	Grinding / Gas cutting Areas	

08	Welding Goggles	Against ultra violet rays	Arc welding area	
09	Ear Plug	Low Noise level	Paper Machine area, Boiler House	
10	Ear Muff	High Noise level	Compressor,TG House,Chipper House etc.,	
11	Leather Hand Gloves	Arc welding & Gas cutting	Welding & Cutting areas in all plants.	
12	Asbestos Hand Gloves	Heat radiation	Boiler House,SRP etc.,	
13	Acid / Alkali proof PVC gloves	Chemical Burns	Chemical handling areas in all sections and while taking samples as well as unloading of hazardous chemical from tankers.	
14	Nitrile Gloves	Resistance against certain acids , solvents and alkalis.	Chemical handling areas in all sections and while taking samples as well as unloading of hazardous chemical from tankers.	
15	Surgical Gloves	Skin Irritation	Clos and Laboratory.	

16	Electrical Resistance gloves	Electric Shock	All Electrical Power Supply Sources.	
17	Cotton gloves	Sharp objects	Material / Equipments Handling areas etc.,	
18	Safety Shoe with toe cap	Striking against object ,Struck by moving object ,fall of object from above steeping on sharp and hot objects.	All working areas.	
19	Gum boots	Hazardous Chemicals/Acid Burns.	Chemical / Acid handling areas in all sections.	
20	Leather apron	Falling of hot chips,slag etc	During welding and cutting works in all plants.	
21	PVC Full Suit with hood	Splashing of Chemicals	Chemical handling areas and while any major on line maint. Works.	
22	Fire retardant coat	Ultra violet rays,Falling of hot chips,slag etc	Welders while welding.	
23	Aluminized fire proximity suit	Heat radiation	During maintenance work in Paper Machine and any emergency periods in case of Fire.	

24	Safety Belt	Falling of persons from height	Any works above 2 mtrs height.	
25	Safety Net	Additional protection against falling of persons.	At all elevated working areas and erection sites.	
26	Pleated type nose filter	Against dust and powder particles	CAP,CHP,Lime Godown, Bagasse yard,Pith Yard,Pulp Mill etc.,	
27	Cup type nose filter	Fine dust,fumes etc.,	Hazardous Chemical Handling areas.	
28	Double cartridge gas mask	Chlorine / So_2 / Acid fumes.	Hazardous chemicals handling and storage areas.	
29	Self Contained air Breathing Apparatus(SCBA)	Certain airborne contaminants like chlorine , Clo_2 and So_2 etc.	Chlorine/So_2 godown, Clo_2 plant,WTP,Fire Section and any confined areas, in case of any emergencies.	
30	SAFETY BARRIER CREAM	Skin Irritation	ETP and Chemical handling areas.	

7.1.8.a Calendar of Operation for New Plantation Maintenance Operation

S.NO	ACTIVITIES	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR
A	**IDENTIFICATION & DOCUMENTATION**												
1	Area identification												
2	Document collection												
3	Obtaining legal opinion												
4	Field inspection												
5	Soil & water sample collection												
6	Agreement signing												
7	Registration of area												
B	**PREPLANTING**												
1	Contract fixation												
2	Survey and boundary demarcation												
3	GPS mapping												
4	Bush clearing												
5	Field layout & Block/road formation												
6	Ploughing												
C	**PLANTING**												
1	Ordering the required plants												
2	Transport of plants to field												
3	Planting of seedling/clones												
4	Providing life irrigation												
6	Fixing Field Board												
D	**MAINTENANCE**												
1	First Inter ploughing												
2	Weeding & soil working												
3	Fertilizer/ manure application												
4	Second interploughing												
5	Third interploughing												
F	**SUPERVISION**												
1	After planting inspection by Officer												
2	After planting inspection by Supr												
G	**MONITORING**												
1	Internal monitoring												
H	**ASSESSMENT & EVALUATION**												
1	External assessment & evaluation												

7.1.8.b Calendar of Operation for Existing Plantation Maintenance Operation

S.NO	ACTIVITIES	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR
D	**SECOND YEAR MAINTENANCE**												
1	First Inter ploughing												
2	Weeding & soil working												
3	Fertilizer/ manureapplication												
4	Second interploughing												
5	Third interploughing												
D	**THIRD YEAR MAINTENANCE**												
1	First Inter ploughing												
4	Second interploughing												
D	**FORTH YEAR MAINTENANCE**												
1	First Inter ploughing												
4	Second interploughing												
D	**FIFTH YEAR MAINTENANCE**												
1	First Inter ploughing												
E	**HARVESTING YEAR**												
1	Yield estimation												
2	Contract fixation												
3	Harvesting												
4	Clearing for regeneration												
F	**SUPERVISION**												
3	Inspection by Officer												
4	Inspection by Supr												
G	**MONITORING**												
1	Internal monitoring												
H	**ASSESSMENT & EVALUATION**												
1	External assessment & evaluation												

7.1.9. Raw Material Resource Plan & Achievement in TNPL Plantation scheme

TNPL commissioned the first paper machine with a capacity of 90,000 TPA and doubled the capacity in 1996 to 1,80,000 TPA by installing the second paper machine. Thereafter the capacity has been enhanced to 2,30,000 TPA through up gradation of both the Paper Machines during 2002. With the implementation of Mill Development Plan (MDP), the capacity is increased to 2,45,000 TPA in 2007-08. After the Mill Expansion Plan (MEP) the present production capacity is 4,00,000 TPA.

TNPL is also credited with the unique distinction of recycling waste into wealth by using bagasse as primary raw material. Bagasse is known to be the most eco-friendly renewable resource for papermaking. TNPL uses about 10,00,000 MT of bagasse every year instead of wood and has thus saved the forest cover in about 40,000 acres every year.

Pulp wood consumption and procurement status:

Currently, TNPL is consuming about 10,00,000 MTs of pulpwood per annum at its Unit-I and Unit-II. The company had signed a Memorandum of Understanding (MoU) with Tamil Nadu Forest Plantation Corporation Ltd (TAFCORN) for assured supply of Eucalyptus wood. In terms of the agreement, TAFCORN would supply up to 70% of their annual output or 1.70 lac MT of pulpwood whichever is higher to TNPL every year.

After considering the pulpwood available with TAFCORN, the industry is still left with a requirement of around 8.00 lac MT of pulpwood to be met from other sources. The consumption of pulpwood also gradually increased along with the production capacity improvement. In order to meet the balance shortfall and become self-sustenance in pulpwood raw material availability TNPL started its plantation activity in the year 2004 and started getting raw material from plantation areas from 2007-08 onwards. The details of pulpwood procured from TNPL plantations are given below:

Year	Quantity (MT)
2007-08	312
2008-09	28
2009-10	24136
2010-11	110945
2011-12	277011
2012-13	141028
2013-14	188491
2014-15	73353
2015-16	94906
2016-17	60034
2017-18	30195

Year	Quantity (MT)
2018-19	173988
2019-20	355986
2020-21	261518
2021-22	313919
2022-23	533320
Total	2639169

From the above table, it is understood that the supply from TNPL plantation sources are positive trend due to continuous improvement in planting programme of TNPL. Considering the pulpwood consumption/requirement, availability from TAFCORN, Existing captive plantations and the improvement in TNPL plantation area, the plan for procurement of pulpwood from TNPL plantations for the next 6 years is given below:

Year	Quantity (MT)
2023-24	6,00,000
2025-26	6,00,000
2026-27	6,00,000
2027-28	6,00,000
2028-29	6,00,000
2029-30	6,00,000

In the **National Forest Policy 1988**, in its resolution No.4.9 relating to Forest-based Industries the following has been highlighted:

- As far as possible, a forest-based industry should raise the raw material needed for meeting its own requirements, preferably by establishment of a direct relationship between the factory and the individuals who can grow the raw material by supporting the individuals with inputs including credit, constant technical advice and finally harvesting and transport services.
- Forest-based industries must not only provide employment to local people on priority but also involve them fully in raising trees and raw material. Farmers, would be encouraged to grow, on marginal/degraded lands available with them, wood species required for industries. These may also be grown along with fuel and fodder species on community lands not required for pasture purposes, and by Forest department/corporations on degraded forests, not earmarked for natural regeneration

In order to achieve self-sustenance in raw material resource and as per national forest policy guidelines, TNPL has introduced plantations scheme in Tamil Nadu during 2004-05. With the concerted effort, TNPL has raised 233774 acres of plantations till 31st March 2023.

7.1.10. Achievements in Plantation Sector

Initially i.e., 2004-05 & 2006-07 TNPL used only seedlings origin plantations to raise plantations. The area under plantation scheme also was less during those periods. Only from 2006-07 onwards Eucalyptus clones have been introduced. After the establishment of Clonal Propagation and Research Centre during 2008 only, the areas under Eucalyptus/Casuarina clones have been increased gradually under TNPL plantations scheme.

Pulpwood Plantation Raised By TNPL Upto 31.03.23 (in Acre)

YEAR	PLANTATION IN ACRE
2004-05	2659
2005-06	6715
2006-07	9986
2007-08	10592
2008-09	10668
2009-10	11766
2010-11	15307
2011-12	15139
2012-13	9614
2013-14	8527
2014-15	6245
2015-16	6897
2016-17	7346
2017-18	3365
2018-19	22345
2019-20	20444
2020-21	20065
2021-22	23600
2022-23	22495
TOTAL	**233774**

7.1.11. Rationale for Rate Of Annual Harvest And Species

EUCALYPTUS/ALTERNATE PULPWOOD SPECIES EXCLUDING CASUARINA

Harvesting techniques

The Silvicultural system of management followed is Simple Coppice system/Clear Felling system based on Eucalyptus or alternate pulpwood species. Pulpwood extraction work is

entrusted to the contractors by TNPL or by Farmers. The trees are felled by saw at a height of 15 cm above ground level. Wood with diameter of 5 cm and above is taken as pulpwood. The felling cut is to be slanting so as to avoid water stagnation on the cut ends of the stump. Slash or cut material, branches or billets are not be heaped on the stumps. The trees are felled, debarked and converted into 1.2 – 1.5 meter billets and then transported to TNPL through lorries. The FSC Certified Claim and FSC Certificate Registration Code will be affixed in the delivery document (i.e) Consignment note of FSC certified wood from FMU.

Rotation age

In order to meet out the pulpmill requirement the rotation age is fixed as 5 years for Eucalyptus/Other Alternate pulpwood species. Depending upon the vigorous coppice growth two more rotations have been planned to be followed in case of Eucalyptus. But at the same time under aged plantations are not felled. In the case, plantation is poorly stocked due to some reason like pest attack and damage due to other reasons and economic yield cannot be expected, such plantations are to be harvested early and replanted by using good planting materials.

Estimated yield from plantations

As on 31.03.2023 pulpwood plantations were raised in 213251 acres under Farm Forestry plantations and 20523 acres under Captive plantation scheme.

Yield estimate was carried by two different external technical agencies and the average expected yield is 50 MT/Ha based on the earlier harvested plantations experience after introducing clonal forestry. Based on current FMU list to be covered under FSC Scope of Certificate, the live Eucalyptus plantations available under TNPL various plantations scheme is 9848 Ha. The yield projections of these plantations are given in table as below:

Yearwise Projected Yield from Eucalyptus Plantations

Year of Raising / Coppicing	Extent (Ha)	Due for Harvest	Projected Yield (MT)
2018-2019	11		
2019-2020	2337	2024 - 2025	117396
2020-2021	1776	2025 - 2026	88792
2021-2022	2685	2026 - 2027	134257
2022-2023	3039	2027 - 2028	151975
Total	**9848**		**492420**

*Includes coppice plantations

CASUARINA

Harvesting techniques

The silvicultural system followed is planting, harvesting at rotation age, uprooting and replanting if preferred. Wood with diameter of 5 cm and above is taken as pulpwood. The trees are felled and converted into 1.2 to 1.5metre billets and 3-3.5 metre incase of Poles and then transported to TNPL through lorries. The FSC Certified Claim and FSC Certificate Registration Code will be affixed in the delivery documents (i.e) Consignment note of FSC certified wood from FMU.

Rotation age

The pulpwood rotation age is fixed as 3 years for Casuarina. On completion of 3 years, the trees are harvested flush with the ground since there is no scope for coppicing. After harvesting, the stumps are to be uprooted and the area to be replanted with seedlings of C.equisetifolia / clones of C.junghuniana depending upon the soil and rain fall of the area.

Estimated yield from plantations

Based on current FMU list to be covered under FSC Scope of Certificate, the live Casuarina plantations available under TNPL various plantations scheme is 10790 Ha. Yield estimate was carried by two different external technical agencies and the average expected yield is 100 MT/Ha based on the earlier harvested plantations experience after introducing clonal forestry. The casuarina pulpwood yearwise projection as follows:

Year of Raising	Extent (Ha)	Due for Harvest	Projected Yield (MT)
2020-2021	3157	2023 - 2024	394650
2021-2022	3845	2024 - 2025	480636
2022-2023	3788	2025 - 2026	473458
TOTAL	**10790**		**1348744**

TNPL Farm Forestry/Captive plantations are raised to meet the pulpwood requirement of mill. These plantations are raised only for harvesting pulpwood which is not raised for any non-timber forest products. So non-timber forest products will not be applicable to TNPL plantations. Further, there will not be any local processing of the pulpwood from TNPL Farm Forestry/Captive plantations.

Felling Plan for Eucalyptus/Alternate Pulpwood Species Plantations

Based on the live plantations available as on 31.01.2023 and FMU list proposed for FSC audit the yearwise pulpwood yield from Eucalyptus/Alternate Pulpwood species plantations are

estimated and tabulated in the above yearwise yield projection table. In order to ascertain the pulpwood for future from TNPL plantations Allowable Annual Cut method will be followed in harvesting operations.

7.1.11.a. Allowable Annual Cut (AAC)

The allowable annual cut is nothing but the maximum felling area which may be cut each year with the quantity of pulpwood to be harvested from the felling area. The Allowable Annual Cut has been determined based on the area & quantity available from TNPL plantations. The yield by area regulation method will be followed for attaining the sustainability in pulpwood from TNPL plantations. In order to maintain the sustainability, 80 % of the available area/quantity will be harvested every year and the balance 20 % will be taken into next year for Eucalyptus/Alternate pulpwood species plantations. Based on this the Allowable Annual Cut Area is fixed and tabulated as below for Eucalyptus/Alternate pulpwood species:

Allowable Annual Cut Area - Eucalyptus/Alternate Pulpwood species (Ha)

Due for Harvesting Year	Actual Area to be Harvested (Ha)	Allowable Annual Area to be Harvested (Ha)
2024-2025	2348	1878
2025-2026	1776	1890
2026-2027	2685	2503
2027-2028	3039	2969
Total	**9848**	**9240**

In line with this, the Allowable Annual Cut Quantity from TNPL plantations is fixed and tabulated as below:

Allowable Annual Cut Quantity - Eucalyptus/Alternate Pulpwood species (MT)

Due for Harvesting Year	Actual Quantity to be Harvested (MT)	Allowable Annual Quantityto be Harvested (MT)
2024-2025	117396	93917
2025-2026	88792	94513
2026-2027	134257	125164
2027-2028	151975	148431
Total	**492420**	**462025**

Similarly, to maintain the sustainability, 70 % of the available area/quantity will be harvested every year and the balance 30 % will be taken into next year for Casuarina species plantations. Based on this the Allowable Annual Cut Area/Quantity is fixed and tabulated as below for Casuarina pulpwood species:

Allowable Annual Cut Area - Casuarina (Ha)

Due for Harvesting Year	Actual Area to be Harvested (Ha)	Allowable Annual Area to be Harvested (Ha)
2023 - 2024	3157	2210
2024 - 2025	3845	3639
2025 - 2026	3788	3805
Total	**10790**	**9654**

Allowable Annual Cut Quantity - Casuarina (MT)

Due for Harvesting Year	Actual Quantity to be Harvested (MT)	Allowable Annual Quantityto be Harvested (MT)
2023 - 2024	394650	276255
2024 - 2025	480636	454840
2025 - 2026	473458	475612
Total	**1348744**	**1206707**

7.1.12. Future Plan For Plantation Development For Sustained Yield

As indicated earlier, consumption and procurement plan for the next 5 years the pulpwood requirement of TNPL is estimated to be around 10 lakh tones. Depending upon the vigorous coppice growth, two more rotations have been planned to be followed in case of Eucalyptus. In the case of Casuarina, all the pulp wood harvested from the plantations will not be available for TNPL.

The methodology adopted, proposed to be adopted for yield regulation is based on area method (Ram Prakash,2000). In this area method, the average projected yield taken as 50MT/Ha from clonal plantations of Eucalyptus in five year rotation and of 100MT/Ha for Casuarina clonal plantations in three year cycle. Based on this calculation the following plantation development plan is proposed to be carried out for next five years.

Plan For Plantations To Be Raised For Next 5 Years

QTY. REQUIRED FOR SUSTAINABLE SUPPLY (MT)				AREA TO BE PLANTED (ACRE)			
YEAR	Eucalyptus	Casuarina	Total	YEAR	Eucalyptus	Casuarina	Total
2024-25	150000	550000	700000	2024-25	10000	20000	**30000**
2025-26	150000	550000	700000	2025-26	10000	20000	**30000**
2026-27	150000	550000	700000	2026-27	10000	20000	**30000**
2027-28	150000	550000	700000	2027-28	10000	20000	**30000**
2028-29	150000	550000	700000	2028-29	10000	20000	**30000**

7.1.12.a. Implementation of Management Activities:

This topic is covered to compiles all the applicable elements of Principle 10 of Forest Stewardship Council®, Forest Stewardship Standard for India: FSC-STD-IND-01-2022 EN.

If the Eucalyptus Coppice growth of harvested plantation is good, then TNPL/Farmers will maintain the Eucalyptus Coppice plantations effectively for next rotation. If the coppice growth is not good then that plantations may be replanted with either Eucalyptus or other pulpwood species based on the site potential and interest of the farmers. TNPL is taking the atmost care not to create any negative impact due do harvesting the pulpwood plantations in FMU.

The Casuarina plantations are maintained for single rotation only through clear felling system. Once the plantations harvested the area may be replanted with either Casuarina or other pulpwood species based on the site potential and interest of the farmers. TNPL is taking the atmost care not to create any negative impact due do harvesting the pulpwood plantations in FMU.

TNPL use species for regeneration that are ecologically well adapted to the site and to the management objectives. TNPL shall use native species and local genotypes for regeneration, unless there is clear and convincing justification for using others if any. The Eucalyptus and Casuarina species predominantly used in TNPL Plantation programme are naturalised to Indian conditions even that are exotic species. Any new clones will be introduced in TNPL Plantation programme after documented field trials or empirical evidence demonstrates their suitability to the site as well as fulfillment of management objectives.

TNPL not using any alien species in its Plantations programme and it may be used when knowledge and/or experience have shown that any invasive impacts can be controlled, and effective mitigation measures are in place if any. Before using alien species for plantation management that will be verified with various research records and consultation with the

experts, regulatory agency. **TNPL not using genetically modified organisms in its Plantations programme.**

TNPL using silvicultural practices that are ecologically appropriate for the vegetation, species, sites and management objectives for its Plantation programme.

TNPL not using any chemical fertilisers in it Captive plantation area. Further, TNPL also recommending the farmers under Farm Forestry scheme to use organic fertilizers and TNPL taking care maximum care to minimize or avoid the use of fertilizers. The fertilizers will be recommend to use when it is equally or more ecologically and economically beneficial than use of silvicultural systems that do not require fertilizers, and prevent, mitigate, and/or repair damage to environmental values including soils.

TNPL using integrated pest management and silviculture systems which avoid, or aim at eliminating, the use of chemical pesticides. TNPL not using any chemical pesticides prohibited by FSC policy. When permissible pesticides are used by farmers if any, TNPL/Farmers will take maximum care to prevent, mitigate, and/or repair damage to environmental values and human health.

TNPL will minimize, monitor and strictly control the use of biological control agents in accordance with internationally accepted scientific protocols. TNPL is using environment associated bioinoculants in its Plantation programme under Nursery level which is not giving any negative impact to the environment.

TNPL plantation programme is concentrated in marginal dry/wet and waste land of Tamil Nadu. Initially TNPL plantation programme is implemented with seedling plantations where there will be a risk of pest & disease and poor yield. Especially the Gall wasp infestation in Eucalyptus plantations. To overcome this, TNPL taken a various research collaboratively with various Forestry research institutes like FC&RI, Mettupalayam and IFGTB, Coimbatore. As a result of this, TNPL developed pest & disease resistance, high yielding site specific clones for its Plantation programme. Through this well systematized research activities TNPL overcome the above mentioned risk which ultimately bring wealth to the farming community. TNPL also having a vision to dispose of waste materials in an environmentally appropriate manner.

7.1.13. Introduction of New Scientific And Technical Knowledge In Plantation Management

The TNPL has established separate Forestry Research and Development unit to cater the scientific and technical needs of the plantation programme. To sub serve the technical and scientific needs, the industry has established adequate research linkage with Forest College &Research Institute, Tamil Nadu Agriculture University, Institute of Forest Genetics and Tree Breeding, State Forest Department and other wood based industries in order to exchange germplasm, development of new varieties and hybrids, precision silviculture technologies to increase the productivity and to reduce rotation, integrated pest and disease management

and also socio economic and environmental impact. Hence the current establishments at TNPL and the multi partite linkages will help to introduce new scientific and technical knowledge to augment the pulp wood production.

Areas of New Technology & Scientific Intervention in TNPL Plantation

TNPL has identified following four major areas, where new technology and scientific knowledge to be introduced and thereby achieve qualitative and quantitative improvement in pulpwood production.

1. Tree improvement programme
2. Technology up gradation in Nursery operation
3. Precision silviculture
4. Mechanization

Tree improvement programme

In order to augment quality improvement in pulpwood production tree improvement is used as a tool and the major activities under this programme are as follows:

1. Selection of superior tree from local germplasm
2. Introduction of new germplasm of various provenance from abroad
3. Inter and intra species hybridization
4. Standardization of micro & macro propagation techniques
5. Conducting multi location adaptive trials

The tree improvement works carried out so far and the road map for future tree improvement programme is as follows:

S.No	Activities	Species	Works carried out so far	Road map for future development
1	Superior tree selection	*Eucalyptus*	80 CPT selected	Annually 100 best trees are to selected in differen agroclimatic zone& various type of soil to screen only 10 superior per annum
		Casuarina	33 CPT selected	
		Gmelina	8 CPT selected	
		Melia	25 CPT selected	
2	Introduction of new germplasm	*E.teriticornis*	Imported 5 provenances	Seedlings are to be tested in multi-location trial and selection of new germplasm suitable for local condition within 5 years. Import of proven high yielding inter species hybrid clones to avoid further time delay in bringing productive clones.
		E.camaldulensis	Imported 11 provenances	
		E.pellita	Imported 6 provenances	
		E.urophylla	Imported 8 provenances	
		E.gomphocephala	Imported 1 provenance	

		E. grandis	Imported 2 provenances	
		E. occidentalis	Imported 2 provenances	
3	Inter and intra species hybridization	*Inter species*	35,000 crosses made between *Eucalyptus* species	Selection of high biomass productive and high cellulose parents from various soil conditions for crossing to get better progenies suitable for Tamil Nadu soil & climatic conditions
		Intra species	10,000 crosses made in *E.camaldulensis & E.tereticornis*	
4	Standardization of propagation techniques	*Eucalyptus, Casuarina, Melia, Gmelina, Acacia, Thespecia*	Apical shoot multiplication through Mini hedge garden & Mini-cutting techniques	Standardization of nutrient requirement for individual clones of all species
5	Multi-location adaptive trials	*Eucalyptus*	8 Clonal testing trials, 4 Provenance trials, 6 Hybrid trials, 6 Halfsib trials 2 IFGTB & 13 FCRI trials,	Biometric observation and data collection to be carried out and superior clones are to be selected for massmultiplication and release of new clones
		Casuarina	7 Clonal testing trials, 2 Provenance trials, 4 Halfsib trials 2 IFGTB &2 FCRI trials,	Biometric observation and data collection to be carried out and superior clones are to be selected for massmultiplication and release of new clones
		Gmelina, *Dalbergia,* *Melia* *Thespecia* *Bamboo* *A.cadamba*	1 Clonal testing trials 2 Clonal testing trials 1 Clonal testing trials & 2 FCRI trials 2 Clonal testing trials 1 species trial 1 Provenance trials	

Technology up gradation in Nursery operations

Productivity of plantation is dependent on the quality planting material, which is supplied to the farmer's field. The seed routed plantation has its inherent disadvantages of low survival and low productivity, where-as the clonal material produced from selected proven superior trees, show uniformity, good pulp yield, high survival & growth rate and higher productivity.

The farmers were facing problem of availability of quality plants in time. The concept of clonal production centre was devised by TNPL to achieve self-sufficiency in planting material and production of quality clonal plants to the tune of 50 million clones per annum.

In May 2007 the establishment of Clonal Propagation and Research Centre was started and its present status is 8000 sq.m of fogging and misting chambers, 4000 Sq.m of hardening chamber and 26500 sq.m open nursery with updated technological innovations equivalent to international standards. Mini-gardens and breeding mini- orchards also established in CPRC to carryout breeding and tree improvement works. This would facilitate production of preferred, site-specific high yielding clones suited to individual operational areas and reduce the cost of clones to the company at the same time emerge as a profitable enterprise to the farmers.

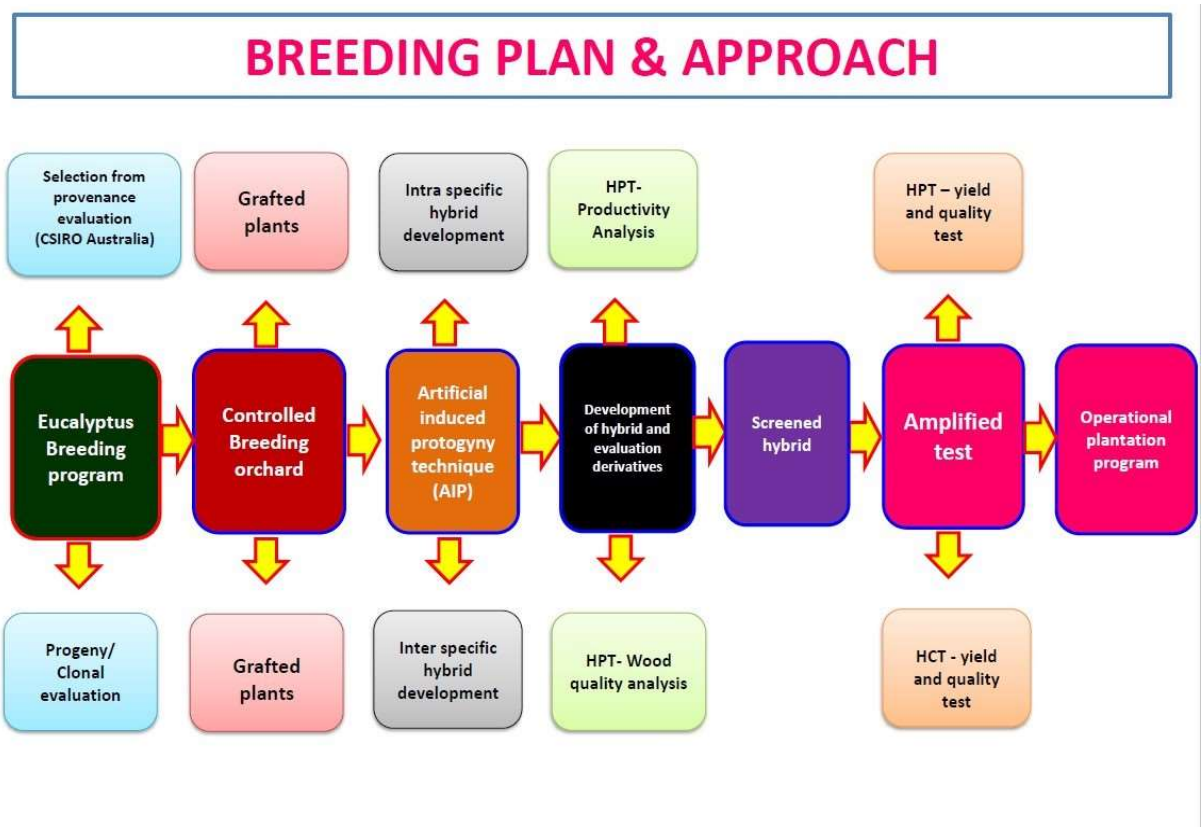
Precision Silviculture

The average growth rates of Pulpwood plantation in India ranges from 5 to 20 m3/ha/yr, whereas phenomenal growth rates have been recorded in Brazil up to75m3/ha/yr (Kageyama 1980) for specific sites. The Rotation age for industrially grown Eucalyptus and Casuarina is also brought down 3-5 years. Such high productivity is due to not only to the inherently aggressive growth characteristic of Eucalyptus and Casuarina, but also because modern silvicultural systems that accelerate this growth. The Pulpwood plantations are to be considered as tree farms, where there is considerable investment is to be made for intensive site preparation, fertilization, irrigation etc. apart from superior genetic planting material. Therefore TNPL also involved in developing precision silviculture models for different pulpwood species suitable for various kind of soil and climatic conditions. The following are the details of field experiments under progress and further scope for establishment of trial

Activities	Species	Works carried out so far	Road map for future development
Optimizing the tree population	*Eucalyptus*	3 spacing trials	Location specific density models to be developed
	Casuarina	4 spacing trial	
Standardizing nutrient requirement	*Eucalyptus, Casuarina, Dalbergia, Melia & Gmelina*		Multi-location fertigation trials to be established to standardize precision silviculture package for each species
Reclamation studies	*Salt tolerant pulpwood & fodder species*	Collection and analysis of salt affected soils from various regions & Documentation	Saline-sodic soil reclamation through Bioremediation & Pytoremediation

Forestry Research Development

To improve productivity per unit area, we are developing new high yielding, cellulose rich and disease resistant clones through selection and hybridization in native stand and imported provenances. We have established breeding orchard with various Eucalypt sp viz., E.camaldulensis, E.tereticornis, E.urophylla, E.pellita and E.grandis to develop inter and intra specific hybrids. The research trails were established in Unit I, Kagithapuram, Karur and Unit II, Mondipatti, Trichy for yield and quality parameters through systematic breeding plan and approach.



Objectives of Tree breeding program are as follows

- Higher productivity and economic returns from a unit area
- Site specific Clones for all types of soils
- Reduction in Rotation cycle
- Good response to intensive management
- To generate required wood with uniform pulp and fiber quality
- Pest and Disease tolerant clone
- Produce at a cheaper cost and quality planting material to farmers

We have established and maintaining research trails at TNPL Unit I, Kagithapuram and TNPL Unit II Mondipatti. For each and every trial, we are maintaining plantation research journals and documented the growth parameters annually. The plantation research journal contains land particulars, location map of trial plantation, Field GPS map, meteorological data, soil & water particulars, plant population details, plantation operation details, details of growth, observations of inspecting officers & officer-in- charge of plantations.

Research trials raised at TNPL Unit I

SN	Name Of The Trial	Extent (ha)
1	Eucalyptus Provinance trial Con III	0.27
2	Subabul provinance trial	0.73
3	Eucalyptus hybrid trial; 2011	0.24
4	Eucalyptus Wetland clonal performance trial	0.31
5	Eucalyptus MPK & JK clonal performance trial	0.10
6	IFGTB Casuarian performance trial	0.03
7	*C.equsetifolia* clonal perfromance trial	0.26
8	*C.junghuhniana* clonal performance trial	
9	Eucalyptus Dryland clonal performance trial	0.24
10	Eucalyptus Genebank I	0.24
11	Eucalyptus Genebank II	0.64
12	Eucalyptus Hybrid 529 cloanl performance trial	0.14
13	Eucalyptus Hybrid trial 2012	0.41
14	Melia spacing + nutrition trial	0.35
15	Casuarina spacing + nutrition trial	0.21
16	Eucalyptus spacing + nutrition trial	0.47
17	Eucalyptus Salt screening trial	0.52
18	Melia conventinal irrigation trial	0.08
Total		**5.25**

Research trials raised at TNPL Unit II

SN	Trials Name	Extent (Ha)
1	Agroforestry Models-Casuarina	0.23
2	Agroforestry Models-D.Sissoo	0.22
3	Agroforestry Models-Gmelina	0.22
4	Agroforestry Models-Subabul	0.09
5	Agroforestry Models-Sithakathi	0.49
6	Agroforestry Models-Custard Apple	0.22
7	Agroforestry Models-Kadamba	0.22

8	Agroforestry Models-Amla	0.22
9	Agroforestry Models-Acrocorpus Trial	0.36
10	Kadamba Field	0.10
11	Banana Agroforestry Trial	0.20
12	Melia GK-10	0.30
13	Casuarina Trial	0.10
14	*Sterculia Foetida* Trial	0.50
15	M.Dubia Trial	0.73
16	Introductory Species	0.14
17	Khaya Trial	0.17
18	Pongamia Trial	0.11
19	Casuarina (MTP-2)	0.49
20	Kadamba	0.10
21	Casuarina- CH-7 Trial	0.30
22	Melia -GK-1 Trial	0.30
23	Luceana Diversetifolia Trial	0.10
24	Eucalyptus Half-Sib Clone Trial	0.55
25	Eucalyptus Hybrid Clone Trial	2.36
26	Eucalyptus Provenance Clone Trial	0.63
27	TNPL E.529 Clone Trial	0.55
28	TNPL E.528 Clone Trial	0.51
29	TNPL E.526 Clone Trial	0.18
30	D.sissoo (DS-1)Trial	0.14
31	M.dubia (M.D-1 & 2) Trial	0.27
32	Melia Clone	0.26
33	Acacia Hybrid Trial	0.30
34	Casuarina equistifolia Clone Trial	0.06
35	Casuarina jhunghuniana Trial	0.19
36	Casuarina Provenace trial	0.08
37	T.populinia Trial	0.25
38	Eucalyptus Hybrid Clone Trial	0.75
39	Casuarina (CJS)	0.46
40	Eucalyptus CPT Trial	0.81
41	Eucalyptus Halfsib Trial	0.75
42	Gene Bank Trial	0.57
	Total	15.59
	Block Plantations	
44	Acacia	5.88
45	Bamboo	5.55

46	Casuarina	9.46
47	Eucalyptus	27.02
48	Kadamba	9.75
49	Kumil	2.90
50	Mangium	19.23
51	Melia	19.33
52	Sissoo	12.29
53	Subabul	2.03
	Total	113.44
	Grand Total	129.03

Provenance Trial

To establish genetic base for TNPL tree improvement program we have imported seedlots from ATSC (Australian Tree Seed Centre), CSIRO (Common Wealth Scientific Industrial Research Organisation), Australia, and collected from other native stands. These selected seed materials are raised and planted. The silvicultural operations like weeding, inter-ploughing and inputs like biofertilizers are applied. The growth parameters like GBH and height are recorded annually. Based the growth parameters the CPT's (Canditate Plus Trees) are selected and coppiced to collect shoots for Clonal Evaluation Trial. To conserve the genetic base the selected CPT are grafted and assembled in breeding orchards and used for hybridization program.

Breeding Orchard

The selected superior trees from provenances trials and from other sources are assembled in breeding orchards at TNPL Unit I for hybridization through AIP (Artificially Induced Protogyny). The mature fullsib seeds are collected from successful crosses to raise hybrid trial.

Major Species assembled in Breeding Orchard

SN	Species	Section	Trait
1	E.tereticornis	Exsertaria	Drought Tolerance, Rooting
2	E.camaldulensis	Exsertaria	Drought Tolerance, Rooting
3	E.grandis	Transversaria	Pulp yield
4	E.pellita	Transversaria	Pest tolerance, Density
5	E.urophylla	Transversaria	Density
6	C.equisetifolia	-	Bark, Density, Salt tolerance
7	C.junghuhniana	-	Disease & Drought tolerance, Coppicing ability

Hybrid Trial

The seeds collected from breeding orchards are raised in nursery and then planted across various agro-climatic zones of Tamilnadu. The Plantations are established under proper replicated experimental designs. The silvicultural operations like weeding, inter- ploughing and inputs like biofertilizers are applied. The growth parameters like GBH and height are recorded annually. Based the growth parameters the CPT's (Candidate Plus Trees) are selected and coppiced to collect shoots for Clonal Evaluation Trial. To conserve the genetic base the selected CPT are grafted and assembled in breeding orchards for further tree improvement program.

Clonal Evaluation Trial

The coppice shoots of CPT's collected from Provenance and hybrid trials are multiplied and planted under proper replicated experimental designs at multiple locations with commercial check clones. The silvicultural operations like weeding, inter-ploughing and inputs like biofertilizers are applied. The growth parameters like GBH and height are recorded annually. The superior genotypes out performing commercial checks are selected and amplified for On-farm trials.

On Farm Trial / Amplified Test

The selected superior clonal ramets over commercial clones are validated for pulping, pest & disease resistance, drought tolerances and other quality characters. The selected superior clonal ramets are planted across multi-locations to study the performance under various soil and climatic condition before commercialization.

Gene Bank

The genetic material form Provenence trials, hybrids and other planting materials which acts as a source of genes for specific traits like pest & disease resistance, quality improvement etc., are assembled in a location for the purpose of conservation.

Mechanization in silvicultural operations

The productivity and profitability of the plantations are directly correlated to the time and type of silvicultural operations. Hence, introduction and practice of mechanization in forestry operations from planting to harvesting is one of the major issues. The steps taken to mechanize the plantation activities in TNPL and further development to be made are given below:

S.No	Activity	Works carried out	Development to be made
1	Land preparation & Planting	Using heavy duty rippers to make deep furrows for rain water harvesting	Planting to be mechanized by introducing tractor drawn planting equipment
2	Harvesting	Petrol power chain saws are introduced to harvest the pulpwood.	Tractor power feller bunchers are to be introduced to harvest Casuarina and other pulpwood species
3	Debarking	Roller type debarking machines installed at mill site to debark the pulpwood from plantation areas, Mobile debarkers introduced to do the debarking in the field itself.	-

Mobile Debarker Machine

7.2. Goal: Environmental Protection

Objective: TNPL aims to conduct its plantation operations in a manner which will maintain and enhance the integrity of environmental and cultural values.

7.2.1. Conservation

7.2.1.1. Environmental and Cultural Values

Preliminary evaluations for the presence of natural and cultural values within the plantations are cascaded to planning process for each plantation operation. This evaluation addresses the requirements of Forest Stewardship Council Principles 6, 8 and 9 including High conservation.

The TNPL Plantation are raised mostly in dry/barren and patta lands which is not having ecosystem services as like natural forest. However, these plantations are having some positive services like presence of cultural trees, soil & water values, clean development mechanism, improvement of climatic factors of the plantations areas and socio-economic status in its working area. TNPL documented these services in its management plan and Environmental/Social Impact Assessment which will be carried out in every year. Further, TNPL complies with applicable requirements in FSC-PRO-30-006 and it may opt FSC Ecosystem Services Claims accordingly.

The identification and management of special values is undertaken in accordance with the TNPL Natural, Cultural and High Conservation Values Management Plan. Issues of potential environmental significance which may be present within the proposed operational area are assessed by TNPL staff. This process involves both field visits and desktop research using natural values databases to identify the location and/or potential presence of issues including flora, fauna, biodiversity, cultural heritage, soil and water, and visual landscape.

7.2.1.2. High Conservation Values

High Conservation Values (HCVs) are classified as values of outstanding and critical importance within plantations. They are intended to capture conservation and biodiversity issues of high priority or significance on a national, regional or global scale, and to ensure that values of national or international conservation and biodiversity significance are properly identified and addressed. HCVs may be identified during the planning process in much the same way as other natural and cultural values described above.

This management plan is based on the principle that the company's routine planning for biodiversity management will include consideration of High Conservation Values. Individual Property Management Plans under long-term management will include a description of any HCVs identified on that property, and the management approach to be employed. Stakeholder will be consulted regarding HCVs as new properties become Provisional Members. TNPL also assess and document the HCVF present in its plantation areas by

engaging experts, stakeholder consultation, national conservation databases like various conservation Acts, etc., The post-operational Conservation Monitoring system, to ensure that all High Conservation Values identified have been maintained and/or enhanced following harvesting will be implemented wherever required at FMU level.

The High Conservation Value Forests of the state (Reserve Forest, Protected Forest, etc.,) are owned by the State Forest Dept only and are protected as per the provision of Indian Forest Act 1927 and Forest Conservation Act 1980. The current captive plantation programme of TNPL is not concentrated in these plantations and hence, the question of Reserve Forest and Protected Forest does not arise. (The area of TNPL plantation activities along with the regular reserve forest area is furnished in the map). Moreover, the current plantation programme of TNPL is as per the direction of National Forest Policy 1988 concentrating more on degraded and marginal farm lands, which also lend support in this regard. Further, if any HCVF presents like Temple trees, Water catchment area, etc., will be identified, documented and protected as per the FSC standards.

Similarly, the question of protection of rare and endangered and threatened (RET) species does not arise in TNPL captive plantation areas. However, the grey slender loris habitat has been found in nearby TNPL Unit II Plantation areas which is documented and protected. TNPL has taken remarkable protective measures to protect this habitat. The IUCN Red List of Threatened Species puts them as least concern, which means they are doing well. TNPL protecting the grey slender loris which are present in the TNPL Unit II Plantation areas through proper protective measures such as planting more habitat trees and avoiding disturbances of habitats. Further, the following steps will be taken to identify and protect the Rare, Endangered and Threatened species in the plantation areas.

Identification of RET species

A base line survey will be conducted before initiation of the plantation programme and the existing species of both wild and domesticated will be documented and reported if any.

Rehabilitation of identified RET species

If any rare endangered and threatened species are found in the plantation area, measures will be taken to mass multiply and re-habitat them in the site of occurrence in order to protect and conserve the species. Necessary field boards will be placed in those localities indicating the status of the species and the need for protection of RET species.

Identification of wildlife resources and the associated corridors:

The TNPL Plantation Dept had detailed consultations with the respective DFOs of the plantation programme area and assessed that the Plantation Programme already established and to be established (Fig-Map) are not housed in the wildlife habitats or the corridor path of the wildlife and hence the plantation plan does not involve in these issues.

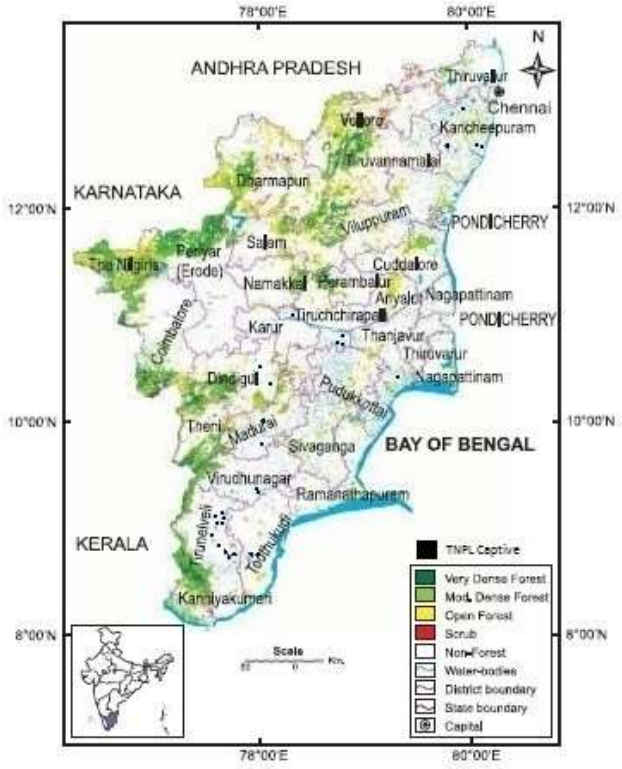
Startegies/Schedule of Management for Each HCVF

1. **Protection of Area**
   A. Category – sacred groves / temple trees / cultural sites / others
   B. Total extent
   C. Boundary coordinates

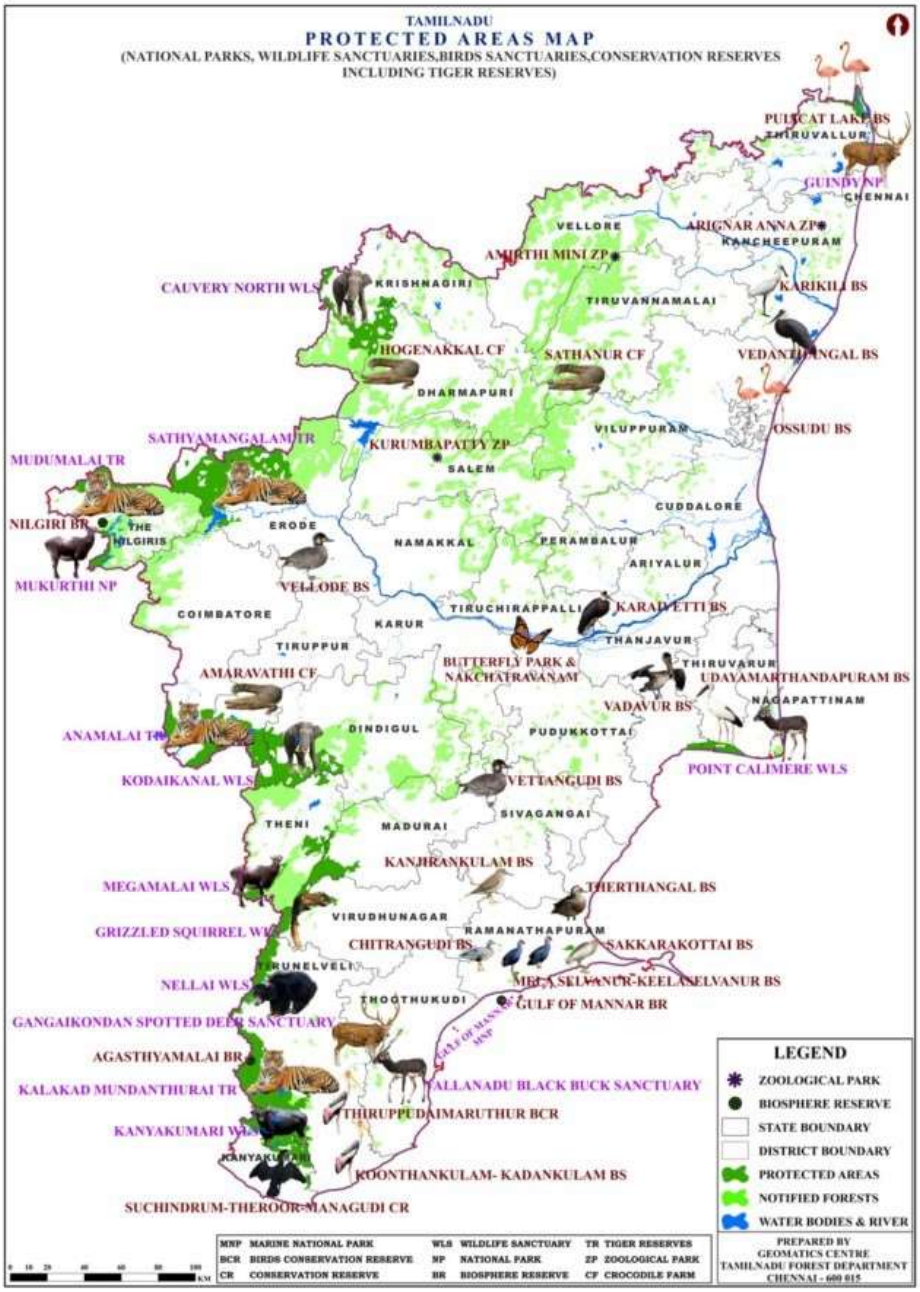
2. **Operational Prescription For Maintenance**
   A. Avoid heavy machineries entering into HCVF area
   B. Place the caution boards
   C. Protect the area with natural fences if necessary
   D. The HCVF are maintained without any disturbance in its natural state. TNPL is also taking maximum care not to create any impact or harm by its plantation activities.
   E. The status of HCVF is monitored by TNPL every year

3. **Restoration**
   A. Documentation of the alien species or riparian function
   B. Remedial action by planting the alien species removed or dried if any

TNPL SAMPLE PLANTATIONS LOCATIONS



MAP SHOWING THE AREAS OF WILDLIFE HABITAT



7.2.1.3. Soil and Water Values

The evaluation of natural and cultural values is the first step in the process of identifying soil and water values, and any potential impacts of a plantation operation on water quality. As part of this assessment process, the location and catchment areas of all watercourses within and adjacent to the proposed operational area are mapped. Parent rock materials, soil types, erodibility characteristics and slopes are all taken into consideration and contribute to the placement of plantation boundaries, and the types of machinery permitted in the plantations.

7.2.2 Impact Mitigation

7.2.2.1. Adjacent Land and Landscape-Level Impact

The lands adjoining TNPL's operations typically consist of cleared or bush grazing runs and other agricultural uses. At the scale and intensity that TNPL operates and given the non-contiguous nature of the operations, the impact on landscape-level values is limited or very low. In general the TNPL captive/Farm Forestry plantations activities are low impact activities only.

7.2.2.2. Operational Monitoring

TNPL regularly monitors all its active operations, and takes responsibility for ensuring that all contractors engaged comply with relevant environmental regulations. This includes the reports which check the operation for compliance with specific aspects of health and safety regulations, any regulatory requirements, and the specific silvicultural prescriptions to be employed. Where ever possible, reports are completed with the TNPL staff and contractor present. This provides an opportunity for all parties to discuss the progress of the operation. During the course of the harvest and shortly thereafter, progressive harvesting assessments are employed to assess the impact on soil and environment.

7.2.2.3. Use of Chemicals

TNPL is committed to not use the pesticides, herbicides and fertilisers in its operations. TNPL is able to avoid chemical use other than where absolutely necessary for management. When managing plantations, a small suite of chemicals may be used to address specific threats to the tree crop if necessary. All chemicals are applied by licensed operators and according to label conditions or off-label permits. Legislation covering chemical use is governed by State laws. If the use of chemicals that are prohibited under the FSC pesticides policy became necessary, a derogation application for their use would be submitted to the certification body prior to use. The Integrated Pest Management Plan maintained by TNPL is used to assist with the management of plantations pests and diseases.

7.2.2.4. Regeneration and succession

The success of plantation forestry in regular forest management system depends primarily on the regeneration pattern and the replacement of one plant community by others through biotic and abiotic successional forces. However, the current TNPL plantation programme is aimed to be concentrated in the marginal and degraded lands thereby, the question of regeneration and succession as happened in regular forest land does not arise. Moreover, the baseline survey study also indicated that there is no evidence of natural regeneration in the identified operational zones, which also attest the scope of current management plan

7.2.2.5. Genetic, species and ecosystem diversity

The TNPL Plantation Dept primarily concentrated on the promotion of traditional pulpwood viz., Eucalyptus and Casuarina in marginal farm lands by suitably incorporating the local agricultural crops as intercrops. Over periods, the Plantation Dept has developed introduction of new and alternate native pulpwood species namely Melia, Dalbergia and Gmelina, which are amenable for short rotation and agro-forestry system. This incorporation of new genetic resources will help to augment the genetic and species diversity besides creating eco-system diversity due to their adoptability in varied agro-climatic zones. The current plantation development plan is an additive action of auguring the genetic and eco-system diversity through the promotion of wide range of genetic resources coupled with multiple cropping systems through silvi- agriculture, silvi-pasture and silvi-horticulture and other Integrated Farming System models. Since the plantation programme is scheduled only in non-forest area and the industry has a long-term plan to reduce the pressure on natural forest by establishing its own plantation thereby it not only avoid to enters into the natural forest; rather it helps to protect and conserve the native genetic and eco-system resources of the forest land.

7.2.2.6. Natural cycles that affect productivity

The factors of locality particularly the land and soil resources decide the success of the plantation programme due to their role in productivity. These land and soil resources over years have been degraded due to inefficient and improper nutrient cycling which resulted in poor productivity of traditional plantations (5 to 7 M^3 per Ha per year). However, the current Captive Plantation/Farm Forestry Programme of TNPL has systematically incorporated Leguminous crops coupled with necessary soil improvements and conservation measures thereby help to reduce the surface run off, soil erosion by improving the soil porosity and water holding capacity. Hence, the captive plantation programme has a sustainable plan of improving the natural cycle of soil and water conservation through application of soil amendments, introduction and cultivation of green manure crops and other rain water harvesting methods like saucer basin planting, contour bunding, farm pond creation for productivity improvement to the tune of more than 10 M^3 per Ha per year.

7.2.2.7. Controlling the invasion of exotic species outside the plantations

In India, the Eucalyptus and Casuarina species were introduced during 19th century itself. Even though these species were introduced to India, now they became naturalized to Indian conditions and become as local species in India. These species are comparatively better in adoptability, growth and productivity than native species of India under the prevailing eco-climatic conditions.

Since these species are naturalized to Indian conditions, there will not be any unusual mortality, disease or insect outbreaks in its plantation areas. The eucalyptus clones used for TNPL captive plantation scheme are gall resistant clones which prevent the gall infections. Though these pulpwood species doesn't have any unique pest and disease outbreaks, TNPL is having its own pest and disease prevent mechanism. TNPL also periodically monitoring its captive plantations to check whether is there any unusual mortality, pest & disease outbreaks and spontaneous regeneration within or outside plantation areas.

TNPL conducted various research multi locations trails (MLT) on pulpwood species/clones before including in plantation implementation plan. Based on these trails and experience in research field, it is confirmed that the exotic pulpwood species promoted by TNPL are ecologically well adapted to the site and not having any invasive characteristics. Generally, the pulpwood species promoted by TNPL are harvested in vegetative stage itself i.e., 3 years for Casuarina and 5 years for Eucalyptus and other species. So there will not be seed setting in the TNPL captive plantations. Due to these facts, the species used in TNPL plantation programme are not invasive, not having significant negative ecological impacts on other ecosystems and there will not be any spontaneous regeneration within or outside plantation areas. So the pulpwood species promoted or planted by TNPL are doesn't have any adverse effect on environment.

Strategy for controlling invasive plant introductions:

TNPL is always having higher concern about the environmental protection and social welfare of the community. So any species which are invasive in nature are not used by TNPL in its plantation programmes. TNPL also introduced any pulpwood species in its plantation implementation plan after they tested in multi-location trials in various aspects like ecologically well adapted to the site, not having any invasive characteristics and productivity, etc., Hence, not using the invasive nature species in TNPL plantation programmes is the strategy followed by TNPL.

Even though the TNPL plantation programme is operating in degraded lands and there is no possibility for invasion of exotic species, TNPL will ensure to control the invasive exotic species if any presents through corporate social responsibility. The decentralized regional officers of plantation dept located across the state will resolve the issue if any rose through continuous monitoring methods.

7.2.2.8. Clean development mechanism

The massive industrial wood programme operating through people participation across various agro-climatic zones of the state will influence the microclimate of the locality in terms of reduction in temperature, optimum humidity and will augment rainfall patterns. This will indirectly help to improve the ecosystems of the locality and will benefit the agricultural cropping systems of the area. Trees in general and tree biomass in particular have the capacity to ameliorate and augment soil fertility status through concomitant addition of leaves and other organic debris. There is also growing international concern over the increase of carbon and the plantation programmes will help to address this issue wherein the industrial wood plantation will sequester and mitigate the carbon crisis thereby helping to develop clean development mechanism. The forestry plantations absorb carbon-di-oxide from the atmosphere and release oxygen which helps in improving the environment. A research study undertaken by the Institute of Forest Genetics and Tree Breeding (IFGTB), Coimbatore on pulpwood plantations (Eucalyptus & Casuarinas) has proved that, it plays a vital role in carbon sequestration. By way of absorbing Carbon-di-oxide from the atmosphere and releasing Oxygen to the atmosphere during the photosynthetic activity, the functions of **Carboncycle** and **Oxygencycle** are well maintained by these pulpwood plantations.

TNPL plantations are also improving the microclimate of the plantation by converting barren land into green cover.

7.2.2.9. Water absorption

Eucalyptus have become the focal point of controversy over the past two decades vis-à- vis their impacts on the environment. But, many issues are really myth and the possible realities are furnished. The criticism against Eucalyptus that it lowers ground water table is baseless as the roots of Eucalyptus rarely go lower than 3-4 mts. and hence it could not tap subterranean water and the shallow root system of Eucalyptus use only surface soil moisture. Eucalyptus roots can break up the soil structure of impervious hard pan and augment rain water percolation creating a net positive effect on the ground water level.

Several research trials in Australia have proved that Eucalyptus is the most efficient utilizer of scarce water resources and in fact the species itself is a good drought tolerant. The Economic and Planning Council of Karnataka (EPCK) Report (CSC, 1985b) argues that the roots of eucalyptus hybrids rarely go lower than 3 – 4 mts deep and usually do not spread out more than 1.5 mts. This indicates that eucalyptus hybrid only consumes subsurface seepage water and it cannot tap subterranean ground water.

Under TNPL plantation programmes, the clones of eucalyptus alone are used which lack tap root system with a secondary root length of 3-4 feet and the question of depleting water table will not arise as evidenced from the earlier reports.

Though TNPL plantations are in marginally dry and waste land, we also developed Standing Operation Procedure to Implement Plantation activities as follows:

- Identify the Environment values of the site
- Verify the same
- Document the Environment Value if any
- Implement Plantation activities without disturbing the Environment Value
- The positive Impact of TNPL Plantations are as follows:

Environmental safeguard: activities, issues, impact and mitigation measures

Activities	Issues	Anticipated level of impacts		Mitigation measuresfor Negative impact
		Positive	Negative	
a)Industrial wood plantation	1. Carrying capacity of land	5	-	
	2. Soil fertility status	4	-	
	3. Soil erosion	3	-	
	4. Agro-biodiversity	3	-	
	5. Crop diversification	4	-	
	6. Air quality	5	-	
	7. Forest cover	5	-	
b) Promotion of pulp	• Long rotation	-	2	Development of fast growing, short rotation clones
c)Alternate industrial wood species	• Identification of alternate industrial wood species	4	-	
d) Water consumption	• Issue on Eucalyptus plantation	-	3	i) The production and supply of clonal Eucalyptus with fibrous root system will help to resolve theissue. ii) Most plantation activities are concentrated in area where the ground water is more than 300 ft depth and hence the question of rapid water consumption does not arise iii) Screening alternate pulpwood species and their promotion will reduce the issue.

7.3. Goal: Social Responsibility

Objective: TNPL aims to conduct its plantation operations in a manner which is in harmony with local communities.

The TNPL plantation programmes will have technological advancement in terms of production, processing, harvesting and marketing of farm driven industrial raw material. The potential of releasing immediate gains like higher productivity will augment economical returns for small and marginal land holders. This technological advancement through clonal options will help to increase not only the productivity but also help to augment the socio economic status of the growers. This schemes aims at holistic participation of various levels of stake holders at all levels of production to consumption systems. The hi-tech nursery planning process along with precision plantation activity will help to convert unutilized farm lands into productive tree lands besides creating huge employment and income generation activity. These activities will have significant impact as source of subsistence for employment, revenue generation besides satisfying the raw material demand of industries. Hence the TNPL plantation activities have excellent scope to improve the socio economic status of the society.

7.3.1. Supporting Regional Communities

TNPL provides employment opportunities for regional harvesting contractors and local people. Where ever possible, regional process are used to process timber close to its source, returning value to the community. The recovery and value adding of otherwise wasted products will be encouraged wherever possible.

In carrying out operations, TNPL aims to protect and enhance the social framework in which it operates by informing the community of our operations and responding appropriately to community concerns. Examples of proactive community engagement include a field day at one of our operations for local government councilors and staff, the hosting of a work experience program for students at a regional high school.

7.3.2. Stakeholder Engagement

TNPL is committed to constructive culturally appropriate engagement with stakeholders. The concerns and priorities of the owner of the land on which operations are proposed may influence the flexibility with which TNPL is able to respond to the concerns of affect stakeholders, including neighbours, and other interested stakeholders. TNPL is committed to balancing the economic, environmental, social and cultural objectives of all interested and affected parties in the context of relevant legislation and contractual obligations. A register of interested and affected stakeholders is maintained and updated on a regular basis with stakeholder feedback and areas of interest being regularly reviewed by TNPL management. Comments may be made to the company at any time via the ‘Contact’ section of TNPL website (www.tnpl.com).

TNPL ensure that other individuals near the operation whose routine activities may not be affected by a proposed operation. This always includes the relevant local government authority. TNPL is open to meeting with stakeholder and other representatives to provide information in relation to local concerns, and negotiating a mutually acceptable outcome.

7.3.2.a. Culturally Appropriate Engagement

The phrase 'culturally appropriate' is defined in the FSC Glossary of Terms and used throughout the FSC P&C and IGIs concerning the design and implementation of dispute resolution and engagement processes with workers, stakeholders and rights holders. It is a concept closely aligned with all elements of the FPIC process.

Culturally appropriate processes consider cultural differences, such as:

- Preferences for direct or indirect negotiation;
- Attitudes towards competition, cooperation, and disputes;
- Desire to preserve relationships among complainants;
- Authority, social rank, and status;
- Ways of understanding and interpreting the world;
- Concepts of time and time management;
- local belief system and worldviews, e.g., ceremony and spirituality;
- Attitudes towards third parties, and
- The broader social and institutional environment in which management activities occur.

TNPL plantations scheme are implemented in the dry & marginal PATTA land where the rights are legally lies with land owner. However, TNPL taking steps to identify the affected stakeholders in its operating areas if any through stakeholder's consultation with all the level of stakeholders. Further, TNPL also taking the following measures to culturally appropriate engagement of affected stakeholders in all its management planning, monitoring and plantation activities process as below:

TNPL will proportionate to scale, intensity and risk of management activities, proactively and transparently engage affected stakeholders if any in its management planning and monitoring processes, and will engage interested stakeholders on request. The initial draft of our Plantation Management plan was distributed to a range of stakeholders including Local Government, community and environmental groups, and landowners in the regions where we had current operations. Comments from them were reviewed and, where appropriate, incorporated into this management plan.

- TNPL used culturally appropriate engagement of stakeholders to ensure that they are proactively and transparently engaged in the following processes:
    - Dispute resolution processes
    - Definition of Living wages – It is nothing but wages which are higher than the legal minimum wages
    - Identification of rights, Indigenous cultural landscapes sites and impacts

- Local communities, socio-economic development activities; and
- High Conservation Value assessment, management and monitoring

- TNPL engages neighboring communities and adjacent landowners to ensure the above elements and they are incorporated in the planning and management strategies of this management plan

- TNPL also committed to provide with an opportunity for culturally appropriate engagement in monitoring and planning processes of management activities that affect their interests for the affected rights holders and stakeholders if any in its operating areas
- Based on request from interested stakeholders they will be provided with an opportunity for engagement in monitoring and planning processes of management activities that affect their interests.

As mentioned above, TNPL engages all the stakeholders, affected parties if any, various research institutes and socio-environmental organizations to develop and implement this plantation management plan to promote its plantation schemes. They are culturally appropriately engaged to identify various rights, HCVF, socio-economic impact in addition to the coining of various monitoring indicators. Accordingly, TNPL envisaged this "Plantation Management Plan" and implemented to complies all the principles of FSC-STD-IND-01-2022 EN.

TNPL also formulated STAKEHOLDER CONSULTATION PROCEDURE as follows:

TNPL will conduct stakeholder consultation based as per of **FSC, Forest Stewardship Standard for India : FSC-STD-IND-01-2022 EN standard** in order to verify the adequacy of its control measures. The stakeholders from various sections will be invited for the consultation meeting and they are as follows:

- Government Agencies who deal with Forestry
- Research Institutes/University
- National/State Forest Agencies/Forestry
- Local/Regional NGO's-Social/Environment/Recreational
- Experts/NGO's
- Labour Union/Association
- Industries/Certificate Holders
- Wood Contractors/Consumers
- Local Public/Workers
- Farmers

The identified stakeholders from the above groups will be invited to participate in the stakeholder consultation through anyone of the following sources in the given stake holder consultation form:

- By phone call
- By sending mail
- By sending letter
- By in-person invitation

During this minimum of 45 days time, all the invited stakeholders will be provided access to the information that is relevant to the FSC 100% procured from Captive/Farm Forestry Plantations by TNPL. The invited stakeholders can be provided their feedback within this 45 days period of stakeholder consultation period. TNPL will also obtain the stakeholders consent to publication of their comments.

The invited stakeholders may be provided their inputs/complaints by the following means:

- By phone call
- By sending mail
- By sending written inputs/complaints through post/courier

TNPL will explain to all the participated stakeholders within 60 days after the stakeholder consultation period about how their comments if any were taken into account.

TNPL will maintain the records of consultation procedures including list of stakeholders, minutes of the meeting, etc., for future reference.

After completion of stake holder consultation TNPL will prepare a summary of the consultation process which will have the following details:

- The area for which the stakeholder consultation conducted
- List of stakeholders invited
- Summary of the stakeholders comments received after getting prior consent from the stakeholders
- Description about how the comments of stake holders are taken into account
- Justification for sourcing the pulpwood from Captive/Farm Forestry plantations as FSC 100%

Format for Stakeholders Consultations:

S.No	FSC-FM PRINCIPLES & Others	Comments
1.	Compliance with Laws and FSC Principles	
2	Workers Rights and Employment Conditions	
3	Indigenous People's Rights	
4	Community Relations	
5	Benefits from TNPL Plantations	
6	Environmental Impact of TNPL Plantations	

S.No	FSC-FM PRINCIPLES & Others	Comments
7	Socio Economic Impact of TNPL plantations	
8	Maintenance of High Conservation Value Forests in TNPL Plantations	
9	Child Labour & Sexual Harassment	
10	Dispute Resolution Process	
11	Indigenous cultural landscapes sites and impacts if any	
12	Any other Specific Remarks	

7.3.3. Assessing Economic and Social Impacts

TNPL has conducted an Impact Assessment appropriate to our scale of operations, and implemented a corporate Socio Economic Performance Plan which aims to protect and enhance the social and economic status community who live nearby our operation. TNPL take the concern of the appropriate stakeholders and respond appropriately and those information will be used to gauge the company's economic and social performance.

7.3.4. Complaint and Issue Resolution

TNPL has an appropriate complaint and Issues Resolution Procedure designed to find a consensus between TNPL and a complainant. This procedure respects and satisfies the ground rules of the FSC Standard. In cases where a dispute relates to the Principles and Criteria of the FSC, the certifying body will be informed in a timely manner as per TNPL complaint and Issues Resolution Procedure (Appendix-D).

7.3.5. Illegal Activities

TNPL identified based on its previous various plantation activities and stakeholders consultation that the illegal harvesting will be a threat in its plantation areas. We are taking all required action to prevent unauthorised or illegal activities within the FMUs where practical to do so like keeping watcher in its Captive plantation areas, contact point (contact person) in each villages of its plantation (Farm Forestry) operating areas. The plantation raised under Farm Forestry scheme will be protected by farmers themselves since it is raised on their own patta land. TNPL is having a multilayer management system by which the various threats like illegal harvesting, etc to the FMUs are controlled. The field officials will visit and monitor the FMU's frequently to eradicate the threats. TNPL officials will also have close association with local public who are like whistle blowers. If any unwanted activities happened in the plantations they will inform the same immediately and we will take corrective actions like recover back the value of loss, etc., These illegal activities if anything happened that will be

documented for reference and further action. **TNPL is committed not to offer or receive any not to offer or receive bribes in money or any other form of corruption and shall comply with anti-corruption legislations.**

7.3.6. Indigenous and Traditional Uses

The admitted rights for both TNPL and Landowners are permitted as per the agreement/applications terms and conditions. Since the land taken by TNPL for raising plantations are legally patta land of either individual farmers or institutions or government, the local communities/stakeholders are not having any legal or customary tenure or use rights on these lands and to utilize the plantation resources. TNPL also raising the pulpwood plantations based on the agreement-applications executed between TNPL and land owners by which the landowners knows the pulpwood plantation establishment activities by TNPL. Hence, there will not be occurrence of free and informed consent to local communities/stakeholders/affected parties. TNPL plantations are developed with an objective to improve the socio-economic status of local communities and not having any undesired impact on society. So, there will not be any affected parties in and around TNPL plantations operating areas. **Further, no schedule indigenous peoples are living in the TNPL plantation areas since it is operated in Patta lands.**

Since TNPL is always committed to work towards welfare of the society, TNPL engages the local labourers for its clonal production, plantation establishment and harvesting activities. Every year TNPL is procuring about 10.00 lakhs MT of pulpwood @ 3000 MT/day. About 10.00 lakhs Mandays are required for harvesting 10.00 lakhs MT of pulpwood @ 1 Manday/MT. Similarly, for producing 510 lakhs clonal in a year about 1.68 lakhs Mandays is required @ 460 Mandays/day. Further, TNPL generates employment opportunities for about 0.10 lakhs Mandays in a year towards plantation establishment activities. Incumulative TNPL providing employment opportunities for local communities about 11.78 lakhs Mandays in a year for plantation activities. By generating and providing this much huge quantity of employment opportunities, TNPL improves the socio-economic status of local community, farmers and labourers.

Further, TNPL also permitting the local communities to collect and remove firewood without causing damage to the stumps. It also helped to avoid any fire occurrence in the plantations. TNPL also permitting the local communities to graze their animals in the plantation area without affecting the stumps. TNPL also permitting the local communities to worship the cultural sites, i.e., temple available in the land if any. For example, A/m.Gandhimathi Amman temple is located near to Paruthipadu captive plantation (FMU Code : S04031). The local villagers are requested to allow about 50 acres of land for this temple festival activity and graze their animals. Therefore, TNPL not raised plantations in these 50 acres and permitted the local villagers to utilise the land for the festival activities as well as grazing activities. By these ways, TNPL ensures the welfare of the local communities.

TNPL involved the local communities, stakeholders, affected parties if any, various research institutes and socio-environmental organizations to develop and implement plantation management plan to promote its plantation schemes.

TNPL having a policy which includes a long-term commitment to forest management practices consistent with FSC Principles and Criteria and related Policies and Standards.

7.3.6.1. Indigenous People Rights:

TNPL plantations are raised in small piece and piece segmented marginal and dry Patta lands which is not having a significance of Intact Forest Landscape "a territory within today's global extent of forest cover which contains forest and non-forest ecosystems minimally influenced by human economic activity, with an area of at least 500 km^2 (50,000 ha) and a minimal width of 10 km (measured as the diameter of a circle that is entirely inscribed within the boundaries of the territory)". Similarly, not evidence of Indigenous cultural landscapes are living landscapes to which Indigenous Peoples attribute environmental, social, cultural and economic value because of their enduring relationship with the land, water, fauna, flora and spirits and their present and future importance to their cultural identity. An Indigenous cultural landscape is characterized by features that have been maintained through long-term interactions based on land-care knowledge, and adaptive livelihood practices.

TNPL plantations schemes are implemented in the patta land belongs to farmers, institutions, temples and various sections of Government where the land owners have the rights and responsibility on that land. Hence, there is not existence of indigenous people like schedule tribes in TNPL operating areas. In Tamil Nadu, the schedule tribes are living in forest/hilly areas mainly. Further, TNPL operating its plantation schemes in the PATTA LAND where the legal rights bind to the land owner. Due to this no situation that requires FPIC in the TNPL plantation operating areas.

However, TNPL will take the following actions to protect the rights of Indigenous people if any present in TNPL operating areas in future in order to complies the Forest Stewardship Council®, Forest Stewardship Standard for India : FSC-STD-IND-01-2022 EN for Assessing Forest Management in India principle of 3.

TNPL will identify and uphold Indigenous Peoples' legal and customary rights of ownership, use and management of land, territories and resources affected by management activities. TNPL will identify the Indigenous Peoples that exist within the Management Unit or those that are affected by management activities. The Organization will then, through engagement with these Indigenous Peoples, identify their rights of tenure, their rights of access to and use of forest resources and ecosystem services, their customary rights and legal rights and obligations that apply within the Management Unit. TNPL will also identify areas where these rights are contested.

- Indigenous Peoples that may be affected by management activities will be identified and the respective list will be documented.
- Through culturally appropriate engagement with the Indigenous Peoples identified the following will be documented and/or mapped:
    - ✓ Their legal and customary rights of tenure*;
    - ✓ Their legal and customary access to, and use rights, of the forest resources and ecosystem services;
    - ✓ Their legal and customary rights and obligations that apply;
    - ✓ The evidence supporting these rights and obligations;
    - ✓ Areas where rights are contested between Indigenous Peoples, governments and/or others;
    - ✓ Summary of the means by which the legal* and customary rights and contested rights, are addressed by The Organization;
    - ✓ The aspirations and goals of Indigenous Peoples related to management activities, Intact Forest Landscapes and Indigenous cultural landscapes.

TNPL will recognize and uphold the legal and customary rights of Indigenous Peoples to maintain control over management activities within or related to the Management Unit to the extent necessary to protect their rights, resources and lands and territories. Delegation by Indigenous Peoples of control over management activities to third parties through Free, Prior and Informed Consent.

- Through culturally appropriate engagement Indigenous Peoples will be informed when, where and how they can comment on and request modification to management activities to the extent necessary to protect their rights, resources, lands and territories
- TNPL will have a written commitment, signed by the top management, and publicly available, that it recognizes and respects all the legal and customary rights of indigenous peoples identified if any
- The legal and customary rights of Indigenous Peoples will not be violated by TNPL
- Where evidence exists that legal and customary rights of Indigenous Peoples related to management activities have been violated the situation is corrected, if necessary, through culturally appropriate engagement and/or through the dispute resolution process
- Free, prior and informed consent will be granted by Indigenous Peoples prior to management activities that affect their identified rights through a process that includes:
    - Ensuring Indigenous Peoples know their rights and obligations regarding the resource;
    - Informing the Indigenous Peoples of the value of the resource, in economic, social and environmental terms;
    - Informing the Indigenous Peoples of their right to withhold or modify consent to the proposed management activities to the extent necessary to protect their rights, resources, lands and territories; and
    - Informing the Indigenous Peoples of the current and future planned forest management activities

- Based on the guidance documents of FSC-GUI-30-003 –V2.0-EN FSC guidelines for the implementation of the right to free, prior and informed consent (FPIC) and Free, Prior and Informed Consent, a Manual by Food and Agriculture Organization (FAO)

- If the process of Free Prior and Informed Consent has not yet resulted in an FPIC agreement, TNPL and the affected Indigenous Peoples are engaged in a mutually agreed FPIC process that is advancing, in good faith and with which the community is satisfied.
- If the customary and traditional use rights have been settled legally, TNPL has in its possession the legal notifications for rights settlement and the orders from competent authorities in this regard are made publicly available.

In the event of delegation of control over management activities, a binding agreement between TNPL and the Indigenous Peoples will be concluded through Free, Prior and Informed Consent. The agreement will define its duration, provisions for renegotiation, renewal, termination, economic conditions and other terms and conditions. The agreement will make provision for monitoring by Indigenous Peoples of TNPL's compliance with its terms and conditions.

- Where control over management activities has been granted through Free Prior and Informed Consent based on culturally appropriate engagement, the binding agreement contains the duration, provisions for renegotiation, renewal, termination, economic conditions and other terms and conditions.
- Records of binding agreements will be maintained.
- The binding agreement will contains the provision for monitoring by Indigenous Peoples of TNPL's compliance with its terms and conditions, provisions for joint monitoring in case of any discrepancies noted, and mechanisms for dispute resolution.

TNPL will recognize and uphold the rights, customs and culture of Indigenous Peoples as defined in the United Nations Declaration on the Rights of Indigenous Peoples (2007) and ILO Convention 169 (1989). The rights, customs and culture of Indigenous Peoples as defined in UNDRIP, ILO Convention 169 and provisions of India legal code will not be violated by TNPL. Where evidence that rights, customs and culture of Indigenous Peoples, as defined in UNDRIP, ILO Convention 169 and as granted within the Indian legal code, have been violated by TNPL, the situation will be documented including steps to restore these rights, customs and culture of Indigenous Peoples, to the satisfaction of the rights holders.

TNPL through engagement with Indigenous Peoples, will identify sites which are of special cultural, ecological, economic, religious or spiritual significance and for which these Indigenous Peoples hold legal or customary rights. These sites will be recognized by TNPL and their management, and/or protection shall be agreed through engagement with these Indigenous Peoples.

- TNPL through culturally appropriate engagement with *Indigenous People*, will identify sites of special cultural, ecological, social, economic, religious or spiritual significance to them
- The measures to protect such sites to be agreed will be documented and implemented through culturally appropriate engagement with Indigenous Peoples. When Indigenous Peoples determine that physical identification of sites in documentation or on maps would threaten the value or protection of the sites, then other means will be used
- These sites will be demarcated on maps, and, where possible, in the field as well and documented in the management plan or any other appropriate document.
- TNPL officials/contractors/workers will be trained in procedures for protection of such sites of special significance
- Wherever sites of special cultural, ecological, economic, religious or spiritual significance are newly observed or identified, TNPL cease activities immediately in the vicinity until protective measures have been agreed to with the Indigenous Peoples, and as directed by local and national laws
- Identification of special sites of archaeological importance will be communicated to the appropriate authorities and TNPL abides by any restrictions or terms of use as imposed by the said authorities for such sites

TNPL will uphold the right of Indigenous Peoples to protect and utilize their traditional knowledge and shall compensate local communities for the utilization of such knowledge and their intellectual property. A binding agreement will be concluded between TNPL and the Indigenous Peoples for such utilization through Free, Prior and Informed Consent before utilization takes place, and shall be consistent with the protection of intellectual property rights.

- Traditional knowledge and intellectual property will be protected and are only used when the acknowledged owners of that traditional knowledge and intellectual property have provided their Free, Prior and Informed Consent formalized through a binding agreement
- Indigenous Peoples will be compensated per the binding agreement reached through Free, Prior and Informed Consent for the use of traditional knowledge and intellectual property
- TNPL will establish and implement procedures for Access and Benefit Sharing (ABS) with eligible Indigenous Peoples, if its management activities come under the provisions of the Biological Diversity Act, 2002.

LIST OF SCHEDULE TRIBES IN TAMIL NADU

Adiyan 2. Aranadan 3. Eravallan 4. Irular 5. Kadar 6. Kammara (excluding Kanyakumari district and Shenkottah taluk of Tirunelveli district) 7. Kanikaran, kanikkar (in Kanyakumari district and Shenkottah taluk of Tirunelveli district) 8. Kaniyan, Kanyan 9. Kattunayakan 10. Kochu Vclan 11. Konda Kapus 12. Kondareddis 13. Koraga 14. Kota (excluding Kanyakumari

district and Shenkottah taluk of Tiruneleli district) Kudiya, Melakudi 15. Kudiya, Melakudi 16. Kurichchan 17. Kurumbas (in the Nilgiris district) 18. Kurumans 19. Maha Malsar 20. Malai Arayan 21. Malai Pandaram 22. Malai Vedan 23. Malakkuravan 24. Malasar 25. Malayali (in Dharmapuri, North Arcot Pudukottai, Salem, south Areot and Tiruchirapali districts) 26. Malayekandi 27. Mannan 28. Mudugar, Muduvan 29. Muthuvan 30. Palleyan 31. Palliyan 32. Palliayar 33. Paniyan 34. Sholaga 35. Toda (excluding Kanyakumari district and Shemkottah Taluk of Tirunelveli district) 36. Uraly

7.3.7. Corporate Responsibilities

7.3.7.1. Occupational Health and Safety

Industry standards of health and safety are maintained by TNPL and enforced among its sub-contractors, in accordance with local and central legislation. All operations comply with the relevant Forest Safety code as verified by Safety Audits of contractors once six month recorded on TNPL's Forest Operation Compliance Monitoring Form. Any safety issues identified are managed using the company's Corrective and Preventive Action Procedure.

7.3.7.2. Employment and Skills Development

The importance of maintaining staff skill levels, which meet current industry challenges and requirements, is essential for sustainable forest management. Records of each employee's accreditations and qualifications are held by the training officer, training department and reviewed at the annual Management Review against the evolving needs of the company. Similarly, TNPL requires proof of proper accreditation from all its contractors for their individual employees and the tasks they perform. Workers and contractors are kept up to date with their skills and knowledge as TNPL management becomes aware of developments in the industry.

7.3.7.3. Workers' Rights and Employment Conditions

All staff at TNPL are engaged and promoted on the basis of qualifications, skills and experience. Each staff member undergoes an annual Employee Performance Review. TNPL is an equal-opportunity employer, which acknowledges the rights of employees and contractors to participate in labour organisations and collective bargaining, and to associate freely. Negotiations with workers are carried out in good faith and with best efforts to reach mutual agreement. A suite of company policies covering employee rights and responsibilities has been established and is available to all employees.

TNPL will uphold the principles and rights at work as defined in the ILO Declaration on Fundamental Principles and Rights at Work (1998) based on the eight ILO Core Labour Conventions. TNPL does not employ workers below the age of 15, or below the minimum age as stated under national, or local laws or regulations, whichever age is higher. It also

eliminated all forms of forced and compulsory labour and there is no discrimination in employment and occupation.

TNPL also promotes gender equality in employment practices, training opportunities, awarding of contracts, processes of engagement and management activities. All genders are paid the same wage when they do the same work. In Plantation the contractors are paid on Per Ha or Per MT basis for their works. The Contractors also paying to the labourers on per Ha or Per MT basis without any gender bias. The wages paid to the workers by TNPL and the Contractors are always higher than the minimum wages.

TNPL committed to ensuring compliance with relevant legislation and FSC standards related Corruption and Crime Commission, Anti-discrimination, avoidance of child labour and avoidance of illegal harvesting.

TNPL complies the Principle 2 of Forest Stewardship Council®, Forest Stewardship Standard for India: FSC-STD-IND-01-2022 EN in its operating areas.

TNPL complies the principles and rights at work as defined in the ILO Declaration on Fundamental Principles and Rights at Work (1998) based on the eight ILO Core Labour Conventions in which India ratified six ILO conventions. No person under the age of 18 is employed in hazardous or heavy work except for the purpose of training if any within approved national laws and regulation. TNPL has prohibited worst forms of child labour in its operating areas.

The following six ILO conventions are ratified by India:

- Forced Labour Convention (No. 29)
- Abolition of Forced Labour Convention (No.105)
- Equal Remuneration Convention (No.100)
- Discrimination (Employment Occupation) Convention (No.111)
- Minimum Age Convention (No.138)
- Worst forms of Child Labour Convention (No.182)

The following two ILO conventions are not ratified by India:

- Freedom of Association and Protection of Right to Organised Convention (No.87)
- Right to Organise and Collective Bargaining Convention (No.98)

TNPL complies the applicable elements of the above India ratified six ILO conventions in its Plantations schemes implementations.

TNPL eliminated all forms of forced and compulsory labour in its operations. Employment relationships are voluntary and based on mutual consent, without threat of a penalty in TNPL. There is no evidence of any practices indicative of forced or compulsory labour in TNPL including but not limited to, the following:

- Physical and sexual violence
- Bonded labour
- Withholding of wages /including payment of employment fees and or payment of deposit to commence employment
- Restriction of mobility/movement
- Retention of passport and identity documents
- Threats of denunciation to the authorities.

TNPL ensuring that there is no discrimination in employment and occupations. TNPL does not discriminate workers on the basis on caste, creed, religion, gender, age, region or sexual orientation. TNPL respects freedom of association and the right to collective bargaining.

- TNPL Workers are able to establish or join worker organizations of their own choosing.
- TNPL respects the rights of workers to engage in lawful activities related to forming, joining or assisting a workers' organization, or to refrain from doing the same; and will not discriminate or punish workers for exercising these rights.
- TNPL negotiates with lawfully established workers' organizations and/ or duly selected representatives in good faith and with the best efforts to reach a collective bargaining agreement.
- Collective bargaining agreements are implemented where they exist

TNPL is having gender equality in its employment practices, training opportunities, awarding of contracts, processes of engagement and management activities.

- TNPL is having the systems that promote gender equality and prevent gender discrimination in employment practices, training opportunities, awarding of contracts, processes of engagement and management activities.
- In TNPL job opportunities are open to both women and men under the same conditions, and women are encouraged to participate actively in all levels of employment.
- TNPL included the work typically carried out by women (nurseries, silviculture, etc.) is in training and health & safety programs to the same extent as work typically carried out by men.
- In TNPL all genders are paid the same wage when they do the same work.
- In Factory the payment to the women workers are paid directly to their bank account
- Maternity Leave and benefits are provided as per the provisions of the Maternity Benefits Act, 1961.
- TNPL ensures and facilitates active participation of all genders in meetings as well as decision making forums.

Confidential and effective mechanisms exist for reporting and eliminating cases of sexual harassment and discrimination based on gender, marital status, parenthood or sexual orientation.

TNPL has constituted an Internal Complaint Committee (ICC) in accordance with Section 4 of the Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2013 & Rules made thereunder.

TNPL implement health and safety practices to protect workers from occupational safety and health hazards. These practices are proportionate to scale, intensity and risk of management activities, meeting or exceeding the recommendations of the **ILO Code of Practice on Safety and Health in Forestry Work. (Refer TNPL Plantation Safety Manual).**

- TNPL kept records on health and safety practices including accident rates and lost time to accidents
- The health and safety practices are reviewed and revised regularly if needed and immediately after occurrence of major incidents or accidents

TNPL is paying wages that meet or exceed the minimum wages applicable. In the field, the workers are getting paid either by per Unit basis like per Ha or per MT which will be always more than the minimum wages applicable as per national laws. Hence, there is no existence of lesser payment than minimum wages in TNPL. However, if no minimum wages level exist in future, then wages are established through culturally appropriate engagement with workers and / or formal and informal workers organizations.

TNPL providing various job-specific training and supervision to safely and effectively implement the Management Plan and all management activities.

- The various job specific training are given to the workers as per Annex-B.
- TNPL is maintaining up to date training records given to all relevant workers.
- Based on consultation with workers, their representatives and local communities, TNPL identifies and provides workers with opportunities for training and upskilling to provide avenues for improving their economic well-being.

TNPL is having mechanisms for resolving grievances and for providing fair compensation to workers for loss or damage to property, occupational diseases, or occupational injuries sustained while working for TNPL. The CGM (Plantation, R&D) and SO is having the responsibility to sort out the disputes if any raised by any of the stakeholders who will be as Ombudsman for Plantation Implementation activities. In order to facilitate him, DGM (Forestry) will verify and assess the root cause of the nature of complaints and it will be sorted out as per TNPL Complaints/Inputs Procedure for Stakeholders. As per Factory premises concern, GM (HR) is having the sole responsibility for dispute solving mechanism. If the resolution given by Ombudsman or GM (HR) is not satisfactory for any of the stakeholders then they may contact the top management of TNPL *i.e.,* Chairman and Managing Director, TNPL Corporate Office, Chennai. Further, the disputes are not solved, they may take legal action in the District Court of Karur.

- TNPL plantation department is established dispute resolution mechanism through culturally appropriate consultation with workers and their representatives which includes, inter alia,

- A mechanism for receipt of complaints, both formal as well as informal, including anonymous complaints
- Acknowledgement of receipt of formal complaints
- Process of investigation of complaints received.

➢ Workers grievances are identified and responded to and are either resolved or are in the dispute resolution process.

➢ Fair compensation will be provided to workers for work-related loss or damage of property and occupational disease or injuries.

7.4. BIO DIVERSITY

Biodiversity

Biological diversity deals with the degree of nature's variety in the biosphere. This variety can be observed at three levels; the genetic variability within a species, the variety of species within a community, and the organization of species in an area into distinctive plant and animal communities constitutes ecosystem diversity.

Biodiversity Management Approaches

- Biodiversity Park – Multiple Tree Species
- Neem Park
- Medicinal Plant Garden
- Tree Nursery & Ornamental Plant Nursery

Biodiversity Park

TNPL has established a biodiversity park by assembling more than 100 species of trees at about 6.07 hectares of land in TNPL Unit I housing colony area and 33.23 ha of land in TNPL Unit II. This park is maintained free from pesticides to facilitate habitat of faunas like birds, insects, butterflies, reptiles and mammals. The ecosystem maintained in the Biodiversity Park is assessed periodically for effective monitoring of floras and faunas in the park. This assessment helps to study the population of different species and presence of any new species in the park.

List of Plants at TNPL Unit I & Unit-II

SN	Name of the Species	Extent (ha)
1	*Khaya senegalensis*	3.4
2	*Swietenia mahagoni*	12.65
3	*Mosaic Plants*	2.5
4	*Azadirachta indica*	16.9
5	*Terminalia arjuna*	1.85
6	*Simarouba glauca*	0.4
7	*Thespesia populnea*	6.58

8	*Pongamia glabra*	4
9	*Pterocarpus santalinus*	3
10	*Dalbergia nigra*	3.42
11	*Santalum album*	2.1
12	*Grevillea robusta*	0.7
13	*Tectona grandis*	20.35
14	*Albizia lebbeck*	2.63
15	*Pterocarpus marsupium*	1.6
		82.08

S.No.	Scientific Name	Common Name
	ORNAMENTAL PLANTS	
1	Caryota urens	Fish tail palm
2	Cycus circinalis	Cycus
3	Cycus revoluta	Cycus
4	Ficus elastica	Rubber
5	Phoenix sylvestris	Wild date palm
6	Polyalthea longifolia	Ashoka tree
7	Wodetiya bifurca	Fox tail palm
8	Ficus benjamina	Weeping fig
9	Ficus panda	Ficus tree
10	Ravenella madacascariensis	Travellers palm
11	Jatropha pandaurifolia	Physic nut
12	Neerium oliander	Arali
13	Hamelia patens	Scarlet bush
14	Calliandra erythrocarpa	Powder puff
15	Allamanda purpurea	Allamanda
16	Ixora coccinea	Vetchi poo
17	Tabernaemontana coronaria	Nandhiyavattai
18	Hibiscus rosasinensis	Sembaruthi
19	Furcaria sp	Green aloe
20	Sansivaria sp	Snake plant
21	Bambusa vulgaris	Bamboo
22	Bambusa ventricosa	Buddhas Belly
	TIMBER TREES	
1	Acacia auriculiformis	Australian wattle
2	Acacia mangiam hybrid	Mangium
3	Albezia lebeeck	Vagai
4	Alangium salvifolium	Alangium
5	Antocephalus kadamba	Kadambam
6	Bambusa bamboo	Bamboo
7	Casurina equisettifolia	Savuku
8	Dalbergia latifolia	Rose wood
9	Dalbergia sissoo	Sissoo
10	Gmelina arborea	Kumil
11	Grevelia robostra	Silver oak
12	Kaya sengalensis	African mahagoni
13	Melia dubia	Malai vembu
14	Populus deltoides	Cotton wood
15	Pterocarpus marsubium	Vengai
16	Samania saman	Rain tree
17	Tectona grandis	Teak
18	Terminalia arjuna	Neer marudu
19	Terminalia bellirica	Thandri
20	Casuarina junghniana	Savuku
21	Bambusa tulda	Bamboo
22	Bambusa balcooa	Bamboo
	SHADE TREES	
1	Bombax ceiba	Silk cotton
2	Entralobium cyclocarpum	Elephant ear tree
3	Ficus bengalensis	Banyan tree

S.No.	Scientific Name	Common Name
	FRUIT TREES	
1	Achrus sapota	Sapota
2	Citrus aurantifolia	Acid lime
3	Anona muricata	Bull heart
4	Anona squomosa	Custard apple
5	Artocarpus heterophyllus	Jack
6	Carissa corondus	Kala
7	Ficus glomorata	Fig
8	Inca dulci	Jungle jelabee
9	Mangifera indica	Mango
10	Phyllanthus acidus	Star goosberry
11	Munngtingia calabura	Singapore cherry
12	Psidium gujava	Guava
13	Punica granatum	Pomegranate
14	Sizegium cumini	Jamun
15	Tamarindus indica	Tamarind
16	Persea americana	Avacado
17	Cocus nucifera	Coconut
	MEDICINAL TREES	
1	Alstonia scholaris	Devils tree
2	Areca catechu	Pakku
3	Azardiracta indica	Neem
4	Calliophyllum inophyllum	Punnai
5	Melia azadiracta	Malai vembu
6	Mimosops elengi	Makilam
7	Phyllanthus emblica	Amla
8	Pterocarpus santalinus	Red sanders
9	Santallum album	Sandal
10	Sterculia foetida	Sterculia
11	Prosophis cineraria	Vanni
12	Aegle marmelos	Vilvam
	FLOWERING TREES	
1	Bauhinia purpurea	Orchid tree
2	Cassia fistula	Golden shower
3	Cassia siamea	Kassod tree
4	Delonix regia	Gulmohar
5	Glyricidia maculata	Seemai agathi
6	Hibicusus tiliacious	Malai poovarasu
7	Kigelia pinnata	Sausage tree
8	Millingtonia hortensis	Cork tree
9	Peltophorum ferruginum	Copper pod tree
10	Plumaria alba	Temple tree
11	Plumaria rubra	Temple tree
12	Spathodea companulata	African tulip tree
13	Swietenia mahagony	Mahogany
14	Tabaebuia argentia	Trumpet tree
15	Tabaebuia heterophylla	Trumpet tree
16	Thespesia populenia	Poovarasu
17	Plumaria pudica	Temple tree
18	Tecoma stans	Yellow bells

S.No.	Scientific Name	Common Name
4	Ficus religiosa	Peepal tree
5	Holoptelea integrifolia	Aavi
6	Pongamia pinnata	Pungam
7	Simaruba glaucca	Paradise tree
8	Terminalia catapa	Badam
9	Ficus microcarpa	Kallichi

Neem Park

TNPL established neem park in 1.17 hectares of land at TNPL housing colony during 2008 and 6.84 hectares of land in TNPL Unit II. The park is maintained free from pesticides and chemicals to protect the ecosystem available inside the park. This facilitates enrichment of faunas in the park.

Medicinal Plant Garden

Multiple species of medicinal plants are assembled in TNPL Unit I housing colony area and TNPL Unit II to preserve the species and as well as for medicinal use.

List of Medicinal Plants in TNPL Unit I Colony

S.No	Name of The Plant
	Shrubs (short)
1	*Acalypha indica (Kuppai meni)*
2	*Aloe vera (Sothu Katralai)*
3	*Andrographis paniculata (Siriya nangai)*
4	*Asparagus racemosus (Sathavari)*
5	*Bacopa monnieri (Neer bramhi)*
6	*Bryophyllum pinnetom (Rana kalli)*
7	*Catharanthus roseus*
8	*Centrella asiatica (Vallari)*
9	*Coleus aromaticus (Omavalli)*
10	*Costus speciosus (Insulin plant)*
11	*Curcuma aromatica (Kasthuri manjal)*
12	*Eclipta alba (Karisilankanni)*
13	*Hemigraphis colourara (Murikooti)*
14	*Mentha citrataez (Pudina)*
15	*Ocimum basilicum (Tiruneetru patchilai)*
16	*Ocimum sanctum (Tulsi)*
17	*Phyllanthus amarus (Keela nelli)*
18	*Phyla nodiflora (Podu thalai)*

19	*Piper longum (Val milagu)*
20	*Wedelia calendulacea (Manjal karisilankanni)*
	Shrubs (Tall)
21	*Adathoda vesika (Adathoda)*
22	*Alpinia galanga (Sitharathai)*
23	*Calotrophis gigantea (Velerukku)*
24	*Cassia angustifolia (Senna)*
25	*Euphorbia tirucalli (Tirukalli)*
26	*Hibiscus rosacynensis (Sembaruthi)*
27	*Lawsonia inermis (Maruthani)*
28	*Vitex nugunda (Notchi)*
	Creepers/ Climbers
29	*Clitoria ternata (Sangu puspam- blue)*
30	*Cissus quatrangularis (Pirandai)*
31	*Gimnema sylvestris (Sirukurinjan)*
32	*Gloriosa superba (Kalappaikkilanku)*
33	*Plumbago indica (Senkodiveli)*
34	*Plumbago zylonica (Venkodi veli)*
35	*Solanum tribatum (Thuthuvalai)*
36	*Tinospora cordifolia (Seenthil kodi)*
	Trees
37	*Aegle marmelos (Wood apple)*
38	*Alstonia scholaris (Devil's tree)*
38	*Azadirachta indica (Neem)*
39	*Dillenia indica*
40	*Emblica officinalis (Amla)*
41	*Limonia acidissima (Vila)*
42	*Mimosops elengi (Makilam)*
43	*Nictanthus arbortristis (Pavala malli)*
44	*Pterocarpus santalinus (Red sandal)*
45	*Santalum album (Sandal)*
46	*Saraka indica (Ashoka tree)*
47	*Simaruba glauca (Paradise tree)*
48	*Syzygium cumini ((Naval)*

List of Medicinal Plants in TNPL Unit II

S.No	Name of The Plant
1	*Acalypha indica*
2	*Acanthospermum hispidum*
3	*Achyranthes aspera*
4	*Aerva lanata*
5	*Allmania nodiflora*
6	*Aloe vera*
7	*Alternanthera pungens*
8	*Alternanthera sessilis*
9	*Alysicarpus monilifer*
10	*Amaranthus spinosus*
11	*Amaranthus viridis*
12	*Ammannia baccifera*
13	*Andrographis paniculata*
14	*Anisomeles malabarica*
15	*Asparagus recemosus*
16	*Boerhavia diffusa*
17	*Calotropis gigantea*
18	*Cardiospermum halicacabum*
19	*Cassia auriculata*
20	*Catharanthus pusillus*
21	*Celosia argentea*
22	*Cissus quadrangularis*
23	*Citrullus colocynthis*
24	*Cleome viscosa*
25	*Clitoria ternatea*
26	*Coccinia grandis*
27	*Cocculus hirsutus*
28	*Corchorus aestuans*
29	*Corchorus tridens*
30	*Crotalaria verrucosa*

31	*Croton sparsiflorus*
32	*Cyanthillium cinereum*
33	*Datura metal*
34	*Desmodium triflorum*
35	*Digera muricata*
36	*Diplocyclos palmatus*
37	*Eclipta prostrata*
38	*Elephantopus scaber*
39	*Enicostema axillare*
40	*Euphorbia heterophylla*
41	*Euphorbia hirta*
42	*Euphorbia prostrata*
43	*Evolvulus alsinoides*
44	*Hemidesmus indicus*
45	*Hybanthus enneaspermus*
46	*Hyptis suaveolens*
47	*Indigofera linnaei*
48	*Indigofera tinctoria*
49	*Jatropha gossypiifolia*
50	*Justicia tranquebariensis*
51	*Kleinia grandiflora*
52	*Leucas aspera*
53	*Martynia annua*
54	*Merremia tridentata*
55	*Microstachys chamaelea*
56	*Mimosa pudica*
57	*Mollugo nudicaulis*
58	*Mukia maderaspatana*
59	*Ocimum americanum*
60	*Ocimum tenuiflorum*
61	*Opuntia stricta*
62	*Passiflora foetida*
63	*Pavonia zeylanica*
64	*Pedalium murex*
65	*Pergularia daemia*
66	*Phyllanthus amarus*
67	*Phyllanthus madrapatensis*
68	*Physalis minima*
69	*Pupalia lappacea*
70	*Rhynchosia aurea*

71	*Sansevieria cylindrica*
72	*Sesamum laciniatum*
73	*Solanum surattense*
74	*Sopubia delphinifolia*
75	*Striga angustifolia*
76	*Trianthema portulacastrum*
77	*Tribulus terrestris*
78	*Trichodesma indicum*
79	*Tridax procumbens*
80	*Triumfetta rhomboidea*
81	*Vigna trilobata*
82	*Vinca rosea*
83	*Waltheria indica*
84	*Xanthium strumarium*

Tree Nursery & Ornamental Plant Nursery

TNPL maintained nursery for rehabilitation of existing species and also to include new species in the park. Apart from this, TNPL also multiplies and maintaining ornamental plants, medicinal plants to increase greenery in and around TNPL.

S.No.	**Name of the species**
List of Tree Species	
1	*Albezzia lebbek*
2	*Azardiracta indica*
3	*Cassia siamea*
4	*Delonix regia*
5	*Entrolobium cyclocarpum*
6	*Ficus religiosa*
7	*Ficus glomerata*
8	*Syzigium cumini*
9	*Millingtonia hortensis*
10	*Peltophorum ferruginum*
11	*Polyalthea sps*
12	*Pongamia pinnata*
13	*Samania saman*
14	*Simaruba glaucca*
15	*Tamarindus indica*
16	*Terminalia catapa*
17	*Thespesia populenia*

18	*Muthanjia calabara*
19	*Terminalia arjuna*
20	*Inca dulce*
21	*Cassia fistula*
22	*Ficus bengalensis*
23	*Bahinia variegate*
24	*Spathodia campanulata*
25	*Tectona grandis*
26	*Hibiscus delicius*
27	*Phyllanthus embilica*
28	*Melia Dubia*
29	*Manilkara zapota*
30	*Ceiba pendantra*
31	*Annona reticulata*
32	*Gmalina arborea*
33	*Mangifer indica*
34	*Mimusops elengi*

35	*Atrocarpus heterophyllus*
36	*Psidium guajava*
37	*Punica grantum*
38	*Couroupita guinensis*
39	*Aegle marmelos*
40	*Madhuca longifolia*
41	*Plerocarpus indicus*
42	*Phyllanthus acidus*
	Flowering Shrubs
1	*Adenium obseum*
2	*Allamanta cathritica 'shrub'*
3	*Allamanta violacea*
4	*Artobotrys odoratissimus*
5	*Bougainvillea sps*
6	*Caesalpinia pulcherrima*
7	*Calliandra emarginata*
8	*Canna indica*
9	*Cuffia sps*
10	*Hibiscus rosacynensis*
11	*Hipiastrum lilly*

12	*Hamelia patens*
13	*Ixora coccinea ' red'*
14	*Ixora coccinea ' pink'*
15	*Ixora 'mini' pink*
16	*Ixora 'mini' 'red'*
17	*Ixora 'mini' white*
18	*Ixora 'mini' yellow*
19	*Jasminum sampac*
20	*Jatropha pandaurifolia*
21	*Lantana camera'red'*
22	*Lantana camera 'yellow'*
23	*Neerium oliander 'pink'*
24	*Neerium oliander 'red'*
25	*Neerium oliander 'yellow'*
26	*Neerium oliander 'white'*
27	*Plumaria pudica (White flr)*
28	*Plumaria dwarf*
29	*Plumaria alba & rubra*
30	*Rose*
31	*Russelia juncea*
32	*Scadoxus multiflorus (lilly)*
33	*Spider lilly 'red'*

34	*Spider lilly 'white'*
35	*Tabernaemontana coronaria 'tall'*
35	*Tabernaemontana coronaria 'dwarf'*
37	*Tecoma stans*
38	*Vinca rosea*
	Foliage Shrubs
39	*Acalypha hispida*
40	*Acalypha wilkesiana*
41	*Aglonema*
42	*Aralia sps*
43	*Cleodendron inerme*
44	*Codeaum variegatum*
45	*Cordyline terminalis 'red'*
46	*Chlorophytum comosum*
47	*Cycus revoluta*
48	*Diffenbachia sps*

49	*Duranta repens*
50	*Eranthemum tricolor*
51	*Eranthemum bicolour*
52	*Eranthemum sps 'yellow'*
53	*Euphorbia pulcherima*
54	*Ficus benjamina*
55	*Ficus panda*
56	*Furcaria*
57	*Murraya exotica*
58	*Mussaenda erythrophylla*
59	*Pedilanthus 'variegated'*
60	*Ploemole reflexa (Song of India)- variegated*
61	*Ploemole reflexa (Song of India)- green*
62	*Polyscias balfouriana*
63	*Polyscias filicifolia*
64	*Polyscias guilfoylei*
65	*Scindiapsis*
66	*Syngonium*
67	*Thipili*
68	*Thuja orientalis*

8.0. MONITORING AND EVALUATION

The TNPL has established systematic monitoring mechanism to evaluate the performance of growth and dynamics of pulp wood plantations. The Corporate has internal monitoring mechanism on minimum yearly once and the status of plantation programme and procurement plan are elaborately reviewed and the issues related to constraints are resolved on need basis. The industry also engages an external agency every year to monitor the growth and dynamics of plantations and to suggest measures for augmenting the productivity and profitability of plantations. The annual growth rate in terms of height, diameter and volume increments is assessed and the growth pattern reports have been maintained by the plantation department.

8.1. Monitoring and Assessment Plan

Monitoring Procedures:

TNPL has established the following two types of monitoring mechanism for its plantation activities:

a. Internal Monitoring
b. External Monitoring

Through this well-structured monitoring mechanism, the internal and external monitoring will be done by TNPL officials once in a year. TNPL also developed various monitoring indicators to assess the on-site and off-site ecological (Environment & HCVF), social impact of TNPL plantation activities during monitoring. TNPL will also incorporate the outcome of monitoring in its Plantation Management plan and will revise the Management Plan accordingly.

In addition to this TNPL also developed its own android based Plantation Mobile application to monitor its plantation activities. The regional field officers will inspect the captive plantations/Farm Forestry plantations of their area once in a year and document growth statistics, activities carried out, etc., using TNPL Plantation mobile application.

a. Internal Monitoring

- The plantations are being monitored at the time of carrying the work in all the plantation areas during the course of implementing different operations in different locations by the field staff up to the level of Officer in Charge of the Region.

- **The Regional Officers are to visit and monitor the plantation activities in each FMU in their control atleast once in year.**

- The internal Monitoring team members Deputy General Manager (Forestry), Assistant General Manager (Plantation), Deputy Managers, Assistant mangers and Field officers will visit the **all the FMU's once in a year to monitor the plantation** activities and its impacts (Environmental & Social) and the FSC related activities carried out by TNPL and report to the Head of Plantation Department. **So all the FMU's will be visited and monitored by TNPL atleast once in a year. Hence, TNPL using the 100% sampling intensity for its internal monitoring mechanism.**

- The Head of Plantation Department will visit the Plantations on need based.

To establish an efficient internal control system ensuring that all members are fulfilling applicable requirements TNPL's Plantation Department developed a system called mobile monitoring of plantation activities. It covers all the plantations activities such as Pre Inspection of land, FMU Registration (including assessment of FSC standard requirements and details of HCVF), Pre Planting Inspection, Distribution Acknowledgement, Post Planting Inspection, Periodic Inspection (Regular), Periodic Inspection (Need Based), Pre Harvest Inspection, Pulp Wood Supply, Post-harvest Inspection etc. This system also includes Farmers List, Transaction Summary, Weather Information. **By this well systematized mobile monitoring system, entire FMU's are visited and monitored atleast once in a year by TNPL.**

b. External Monitoring Mechanism

In order to identify the lacuna and improve the plantations in a fair manner TNPL engages External professional and Technical agencies like SSFRDT (Society for Social Forestry, Research and Development, Tamil Nadu), IFGTB (Institute of Forest Genetics and Tree Breeding), FC&RI (Forest College and Research Institute), Coimbatore and Grow Great, Trichy once in year for evaluating monitoring the pulpwood plantations programme. The agencies are assessing survival percentage, growth rate, regeneration and condition of the plantations, yield of pulpwood, environmental and social impacts of raising plantation and other operations, productivity and efficiency of plantation management. The recommendations made by the external agencies are being duly considered for adoption and thereby significant development has taken place in TNPL. This annual monitoring will assess the effectiveness of the measures employed to maintain or enhance the applicable conservation attributes.

- Monitoring and assessment reports are being documented.
- Plantation management including the research and data collection also to be monitored and documented.
- The results of monitoring will be incorporated into the implementation and revision of the management plan.

The sampling intensity of 0.6 X √FMU will be followed to select the samples in case of new FMU's and 0.3 X √FMU incase of old FMU's and 0.1 X √FMU incase of inactive FMU's.

8.2. Resources for Monitoring

Financial Resources

The monitoring and evaluation requires financial and managerial resources. TNPL invest 100 % financial support for monitoring and evaluation by the external evaluation team comprising of Forest College and Research Institute, Mettupalayam, Institute of Forest Genetics and Tree Breeding, Coimbatore, Society for Social Forestry Research Development, Chennai and Grow Great, Trichy. The agencies are fixed based on competitive mode and the financial resources involved are met by the TNPL plantation department.

Managerial Resources

The managerial resources required for assessment, monitoring and evaluation through growth data and impact assessment are all met by the institutes identified for the purpose of monitoring and evaluation. The managerial resources required for project site identification and other needed issues are met by the plantation department of TNPL.

8.3. Frequency of Monitoring

The internal monitoring is done minimum of one times in a year by the plantation department of TNPL and annual monitoring is done once in a year by the external agency identified for the purpose.

8.4. Parameters for Monitoring and Evaluation

Growth Parameters
The monitoring and evaluation estimates all the growth parameters viz., survival rate, height, diameter at breast height, tree form, presence and absence of pest and diseases and are analyzed with suitable database and incorporated in the management plan.

Yield Parameters

The yield parameters particularly the volume and the weight are estimated annually and the harvest plans are scheduled based on these yield parameters.

Environmental issues

The potential on-site and off-site ecological/environmental impacts (natural regeneration, effects on water resources and soil fertility, etc.,) are assessed through external agency fixed for the purpose.

Socio Economic issues

The potential on-site and off-site socio economic issues like education, sanitation, income, livelihood opportunity, gender issues etc. are assessed through external agency fixed for the purpose.

Assessment and Reporting of High Conservation Value Forest

The monitoring team both internal and external will identify and document the High Conservation Value Forest present within the vicinity of project operational areas and the impact of management activities followed by TNPL for its protection. This HCVF is protected through regular management strategies.

8.4.1.Monitorable Indicators

The TNPL has identified monitoring indicators involving all the variables from the Production upto Conservation and are furnished below in table. These indicators are prepared based on **Annex-F of FSC-STD-IND-01-2022 EN and outcome of various stakeholders consultations, monitoring, environment & social impact assessment by TNPL. These indicators given in the below table are prepared to address the following monitoring elements:**

1. Monitoring indicators includes the following in order to sufficient to identify and describe the environmental impacts of management activities, including where applicable:

- The results of regeneration activities
- The use of ecologically well adapted species for regeneration
- Invasiveness or other adverse impacts associated with any alien species within and outside the Management Unit if any
- The use of genetically modified organisms to confirm that they are not being used
- The results of silvicultural activities
- Application of fertilizers if any and its adverse impacts to environmental values
- Application of pesticides if any and its adverse impacts from the use of pesticides
- Adverse impacts from the use of biological control agents
- The impacts from natural hazards
- The impacts of harvesting and extraction of timber on non-timber forest products, environmental values, merchantable wood waste and other products and services
- Environmentally appropriate disposal of waste materials if any
- The impacts of infrastructural development, transport activities and silviculture to rare and threatened species*, habitats*, ecosystems*, landscape values*, water and soils

2. Monitoring indicators includes the following in order to sufficient to identify and describe social impacts of management activities, including where applicable:

- Compliance with applicable laws, local laws, ratified international conventions and obligatory codes of practice
- Resolution of disputes and grievances
- Programs and activities regarding workers' rights
- Gender equality, sexual harassment and gender discrimination
- Programs and activities regarding occupational health and safety
- Payment of wages
- Workers' training
- Where pesticides are used if any, the health of workers exposed to pesticides
- Full implementation of the terms in binding agreements
- The identification of Indigenous Peoples and local communities and their legal and customary rights if any
- Indigenous Peoples and community relations
- The use of traditional knowledge and intellectual property if any
- Protection of sites of special cultural, ecological, economic, religious or spiritual significance to Indigenous Peoples and local communities if any
- Local economic and social development
- Actual compared to projected annual harvests of pulpwood
- High Conservation Values
- The maintenance and/or enhancement of ecosystem services

3. Monitoring indicators includes the following in order to sufficient to identify and describe changes in environmental conditions including where applicable:

- Environmental values and ecosystem functions including carbon sequestration and storage; including the effectiveness of actions identified and implemented to prevent, mitigate and repair negative impacts to environmental values
- Rare and threatened species, and the effectiveness of actions implemented to protect them and their habitats
- Representative sample areas and the effectiveness of actions implemented to conserve and/or restore them
- Naturally occurring native species and biological diversity and the effectiveness of actions implemented to conserve and/or restore them
- Water courses, water bodies, water quantity and water quality and the effectiveness of actions implemented to conserve and/or restore them
- High Conservation Values identified and the effectiveness of actions implemented to maintain and/or enhance them.

8.4.2.Outcomes of Monitoring and Revision of Monitoring Plan

TNPL in consultation with the internal and external monitoring team and will conceive the outcomes of the monitoring. If any new outcomes or suggestions from Monitoring, then that will be incorporated in the monitoring indicators for effective monitoring in the coming years. Accordingly, TNPL will also revising the monitoring plan fully once in every five years and with partial moderation annually. **TNPL will update its monitoring plan and indicators based on outcome of consultation (or) feedback from various levels of stakeholders like local communities, affected parties if any, various research institutes and socio-environmental organizations as per Annex-E of FSC-STD-IND-01-2022 EN. This indicators will be updated based on the outcome of audit if required.**

During previous year, the monitoring suggested that to include habitat monitoring of Grey slender loris (HCVF) in monitoring indicators. So this indicator is added in the TNPL monitoring indicators for effective monitoring of Grey slender loris and its habitat in TNPL Unit-II Plantation areas in the coming years.

MONITORING INDICATORS

Activity	Monitorable indicator	Output	Outcome
1. Clonal / Seedling production	• Number of ramets /clones producedand supplied within stipulated time	• Production of 1.5 crores ramets/seedlings	• Availability of quality and uniform planting stock
2. Establishment of farmers /Govt. / institutions linked pulpwood plantation	• Area coverage • Number of beneficiaries under contract farming	• Increase in Pulpwood plantation area • Increasing the beneficiaries	• Increase of area under industrial wood plantation • Assured income to the beneficiaries
3. Capacity building	• Number of trainings conducted	• Two trainings /year/region	• Awareness on commercial tree farming • Generation of skilled man power
4. Annual expansion of industrialplantation	• Area of coverage of plantation • Number of beneficiaries	• Increase in area of plantation	• Increased area under pulpwood plantations • Improved standard of living of tree growers • Augmented Clean Development Mechanism
5. Wood technological characterization and development of alternate pulpwood species	• Number of species /clones characterized for cellulose (>45%) • Number of alternate species/clonesdeveloped	• Availability of at least one potential species suitable for varied agro climatic condition	• Alternate genetic resources with high cellulose available to growers and industries
6. Selection of Ecologically well adopted species	• Planting with site specific species/clones	• Better establishment of plantations	• Increasing the area under good quality plantations
7. Precision silviculture techniques	• Quantifiable growth response of industrial wood species to fertigation • Growth statistics of plantation	• Optimal irrigation and fertigation technique for different agro climatic zones • Increase the productivity of plantation	• Site specific Precision silviculture techniques andproductivity improvement • Increase the productivity of plantation and effective implementation of plantation activities

Activity	Monitorable indicator	Output	Outcome
8. Results of Silvicultural activities	• Height, Girth and stocking percentage of plantations	• Improved growth of plantations	• Better establishment and yield
9.Application of fertilizers if any	• Type and Quantity of fertilisers applied by farmers if any • Safely disposal of containers • Recommending organic fertilizers only	• Reducing negative impact on environment	• Stress free environment conditions
10.Application of pesticides if any	• Type and Quantity of Pesticides applied by farmers if any • Safely disposal of containers • Recommending organic pesticides only like neem cake, etc.,	• Reducing negative impact on environment	• Stress free environment conditions
11. Pest and disease management	• Reaction of eucalypts gall insect tovarious management measure • Intensity of wilt disease againstmanagement practices	• Suitable method for control of Eucalyptus gall insect • Opt IPM method of wilt disease management	• Effective method of pest and disease managementto maintain the productivity by avoiding the loss
12. Harvest and post-harvest	• Improvement in harvest efficiencythrough skilled personnel • Number of trees harvested per unit time • Post-harvest management • Soil erosion if any from barren land • Impacts of Harvesting	• Harvest efficiency of 1 MT per man day • Augmented shelf-life ofharvested wood • To arrest the soil erosion if any • Improving and strengthening the environmental values	• Harvest efficiency improvement and reduced impactlogging • Reduction in human drudgery • Increased storage of logs • No soil erosion from barren land • Improving and strengthening the environmental values

Activity	Monitorable indicator	Output	Outcome
13. Socio and economic impacts	• Actual societal improvements (standard of living) • Employment generation (No. of mandays) • Income generation (Per capita)	• Augmenting standard of living through adequate employment and income generation	• Socio-economic improvement in the state
14. Environmental impacts	• Climate data • Soil nutritional data • "C" sequestration • Impacts of Fertilisers/Pesticides • Impacts from Natural hazards	• Amelioration of climate • Augmentation of soil • Sequestration of carbon to the tune of 50 tonnes per Ha • To reduce pollutants • Planting Casuarina species in coastal areas	• Clean Development Mechanism • Organic fertilisers & pesticides • Reducing cyclone effect
15.Regeneration Activities	• Planting pulpwood plantations in dry and barren land • Verifying the plantation activities carried out in field	• Conversion of barren land into cultivable land	• Increasing Green cover and productivity of the land
16. High Conservation Value Forest	• Documentation of RET species • Documentation of Protected areas • Habitat of Grey slender loris • Various HCVF species including cultural/religious tress • Documentation of cultural, ecological, economic, religious or spiritual significance trees or sites • Assessment of High Conservation Value Forest	• Protection of RET and Protected areas • Protection of Grey slender loris habitat and its population • Conserving all kind of HCVF • Conserving the cultural, ecological, economic, religious or spiritual significance trees or sites	• Conservation of overall biodiversity – Species, Genus and Ecosystem • Conserving the Grey slender loris population in TNPL plantation areas • Conserving all kind of HCVF • Conserving the cultural, ecological, economic, religious or spiritual significance trees or sites

Activity	Monitorable indicator	Output	Outcome
17. **Water courses, Water bodies, Water Quality & Quantity**	• Documentation of Water courses, Water bodies, Water Quality & Quantity in the operational areas • Conservation or Restoration activities taken to conserve all the water courses / water bodies available if any • Reducing the pollutants • Increasing green cover to increase the rain fall	• Conserving the water courses / water bodies available if any • Reduce pollutants and improving water quality • Improves water quantity	• Conserving the water courses / water bodies • Reduce pollutants and improving water quality as well as water quantity by increasing green cover
18. Controlling of Invasive Exotic Species or alien species if any	• Documentation of invasive exotic species or alien species if any	• Eradication of invasive or alien species • The invasive or alien species should beremoved with root ball to avoid further spreading and may be fired without any spreading	• Conservation of overall biodiversity – Species, Genus and Ecosystem
19. Minimization of waste	• Debarking of pulpwood	• Debarking done at field itself	• Minimizing the waste generation and improves soil organic matter
20.**Complainces with applicable laws and ratified conventions**	• Complaining applicable laws and • Ratified international conventions and obligatory codes of practice • Verification the compiling of applicable laws/ratified conventions	• Raising legally responsible plantations	• Improving national tree cover with legally managed plantations
21.**Disputes and Grievances**	• **Resolution of disputes and grievances** • Stakeholders discussion about disputes if any • Verifying disputes/grievances record	• Addressing stakeholders disputes • Closing disputes raised by stakeholders with culturally appropriate mechanism	• Sorting out disputes raised by stakeholders if any with culturally appropriate mechanism

Activity	Monitorable indicator	Output	Outcome
22.Training on various aspects to all level of stakeholders including workers **(Occupational health & safety)**	• Training to workers on safety • **Occupational health & safety** • Discussion with all level of stakeholders • Verifying the training records, etc.,	• Improving efficiency and safety • Improving health and stress free working environment	• Improving efficiency and safety • Improving health and stress free working environment
23. **Programmes and activities regarding workers rights**	• Various training given about workers rights • Discussion with workers, contractors, farmers and local public • Verifying the wages, training records, etc.,	• Strengthening the work forces • Confirming the workers rights	• Creating good working environment for workers
24.**Anti-Discrimination (Gender quality, Sexual harassment)**	• **Gender equality** • **Sexual harassment** • No gender Discrimination • Discussion with all level of stakeholders • Verifying the wages, training records, etc.,	• No gender discrimination • Safeguard of women work force as well as men work force	• Raising plantations without any gender bias • Safeguard of women work force & men work force
25.**Payment of Wages**	• Payment of wages • Verifying the wage register, salary slip, etc.,	• Making wages payment without any bias	• Equal work equal pay
26.Agreements	• Implementation of binding agreement in case of captive plantations scheme	• Legally responsible plantations	• Legally responsible plantations
27. Environment values & Ecosystem services	• Assessing various environment values & ecosystem services	• Improving and Conserving Environment and protecting its services	• Environmentally responsible plantations management
28. Long term economic viability	• Assessing the socio-economic impact of plantations • Maintaining the minimum support price and buy back guarantee • Employment generation	• Augmenting standard of living through adequate employment and income generation • Confirming the viable market conditions for pulpwood plantations • Improving the economic status by creating employment generation to workers, local public, etc.,	• Socio-economic improvement in the state • Confirming the sustainable income to all the level of stakeholders

Activity	Monitorable indicator	Output	Outcome
29.Gentically Modified Organism	• TNPL not using GM organism. However, the planting material to be verified in its Plantation implementation Plan	• No genetically modified organism used	• Environmental stability
30.Bilogical Control Agents if any	• Name and quantity of biological control agents used • Impact on Environment either positive or negative • Action taken to minimize the negative impacts	• Safeguarding environment	• Safeguarding environment
31.Illegal activities if any	• Discussion and field visit • Identify the Illegal activity happened if any • Action taken to sort out the same or avoid illegal activity	• To avoid illegal activity in plantation areas	• Avoiding illegal activity in plantation areas
32. Indigenous Peoples and Local communities	• Identification and documentation of Indigenous Peoples and Local communities if any • Their legal rights	• Confirming the rights of Indigenous Peoples and Local communities if any	• Confirming the rights of Indigenous Peoples and Local communities if any
33. Usage of traditional knowledge and Intellectual property	• Documentation of traditional knowledge and Intellectual property if any • Merits paid to them for the same	• Confirming the legally usage of traditional knowledge and Intellectual property	• Confirming the legally usage of traditional knowledge and Intellectual property
34. Representative Sample areas	• Documentation and status of Representative Sample Areas • Effectiveness of actions implemented to conserve them	• Protection of Representative samples	• Protection of Representative samples

9.0. PHYSICAL AND FINANCIAL FORECAST OF OPERATIONS

Keeping the above management plan in mind the general physical and financial forecast is given below for plan period from 2023-24 to 2027-28

ACTIVITY	Units		2023-24		2024-25		2025-26		2026-27		2027-28	
	Physical	Financial	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
Clonal Propagation and Research Centre	Nos.	Rs. Lac	62 million	1310	62 million	1310	62 million	1310	62 million	1310	62 million	1310
Plantations	Acres	Rs. Lac	30000	300	30000	250	30000	300	30000	250	30000	300
Forestry Research and Development	LS	Rs. Lac		50		50		50		50		50
Forest Operations	MT	Rs. Lac	10 lac	77500	10 lac	77500	10 lac	77500	10 lac	77500	10 lac	77500
Environment & Social safe guard	LS	Rs. Lac		250		250		250		250		250
Total		**Rs. Lac**		79410		79410		79410		79410		79410

10.0. CAPACITY BUILDING PLAN FOR STAKEHOLDERS & FIELD STAFF

The success of any people centered plantation programme is vested with the awareness created and the level of participation by the people. Hence TNPL plantation management plan has systematically incorporated awareness creation programme and decentralized capacity building activities to all levels of stakeholders involved in the plantation programme.

The training plan for all the stakeholders & field staff will be prepared based on the existing need & conditions, advanced development with respect to plantation establishment and harvesting, health & safety requirements for all the stakeholders irrespective of all the areas and the findings and results of internal monitoring and audit.

TNPL prepares is training plan as per the Annex-B of FSC Standard of FSC-STD-IND-01-2022 EN. The following elements of training will be covered in TNPL annual training programme:

- Implement plantation activities to comply with applicable legal requirements
- Understand the content, meaning and applicability of the eight ILO Core Labour
- Conventions
- Recognize and report on instances of sexual harassment and gender discrimination
- Safely handle and dispose of hazardous substances to ensure that use does not pose health risks
- Carry out their responsibilities for particularly dangerous jobs or jobs entailing a special responsibility
- Details about Indigenous Peoples if any and their legal and customary rights related to management activities
- Identify and implement applicable elements of UNDRIP and ILO Convention 169
- Identify sites of special cultural, ecological, economic, religious or spiritual significance to Indigenous Peoples and local communities and implement the necessary measures to protect them before the start of forest management activities to avoid negative impacts
- Identify where local communities have legal and customary rights related to management activities
- Carry out social, economic and environmental impact assessments and develop appropriate mitigation measures
- Implement activities related to the maintenance and/or enhancement of ecosystem services, when FSC Ecosystem Services Claims are used if any
- Handle, application of organic fertilisers and
- Implement procedures for cleaning up spills of waste materials

The following activities will help to resolve the issues related to plantation promotional activities, conflict resolution and to create entrepreneurial skill among the participating stakeholders.

10.1. Awareness programme

The industry has a plan to create adequate awareness on the need of agro and forestry based pulp wood plantations in India in general and the state of Tamil Nadu in particular. This awareness programme will be organized initially in the district headquarters and subsequently the programme will be extended to taluk and at village levels. The following awareness programmes are incorporated in the annual working plan and being implemented periodically:

EXTENTION & PUBLICITY	LOCATION
Field Meeting	Plantation Site
Exhibition	District/Taluk HQ
Field demonstration	Field level
Field exposure visit	Region level
Radio/TV/MOBILE advertisement	State level
Advertisements in print media	State level

10.2. Demonstration plots

To create awareness among the farmers about new clones developed by TNPL, the demonstration plots will be raised in each clusters. Through this demonstration plots the farmers can directly see the performance of new clones at their area. It can motivate farmers to adopt and raise new clones. The general guidelines for demonstration plots are as follows,

S.No	Descriptions	Guidelines
1	Plot selection	By Field Officials and approved by CGM (P,R&D) and SO
2	Plot size	Min one acre
3	Location	Must be along the main road
4	Irrigation source	Dry land / Borewell / Open well
5	Soil sample	Soil analysis must be done
6	Layout	Block planting
7	Spacing	3x1.5m
8	Clones	8 new clones + 2 control
9	Display	Demo plot board at field
10	Utilization	Demo plot for training the farmers

10.3. Plantation contractors training

The success of plantation programme depends on the involvement of plantation contractors in all stages of plantation development. Hence all the plantation contractors need to be educated to learn the state of the art plantation technologies management and protection issues. These programmes will be done in a centralized manner at the industrial premises.

10.4. Loggers training

The industry has already introduced mechanization wherever possible in the plantation activities. This is necessary for felling and conversion of pulpwood plantations. Since mechanization is the new concept in felling of pulpwood in this part of the country, it is necessary to provide proper awareness and training about the mechanized operation. Youngster are being selected as machine operators in each coupe among the existing loggers and periodically exposed to the art of semi mechanized felling, safety issues while handling the machines and subsequently benefits of mechanized felling in order to improve the harvest efficiency, reduce the felling loss and eliminate the human drudgery. These programmes will be carried out in a decentralized manner at cluster level in the plantation harvesting areas.

10.5. Training to Plantation Staff

The Plantation staff of TNPL will be trained at the various centers of excellence for updating the recent state of the art technologies both within and outside the country in order to achieve higher productivity and demonstrate profitable plantation models. Sensitization of new technology and scientific information to all the offices by the internal knowledge experts.

The detailed Training Calendar for Farmers, loggers, Plantation contractors and Staff is given below:

Nature of Training	Trainees	LOCATION
Technology sensitization	Plantation Contractors	Regional HQ
	Plantation Supervisors	Plantation HQ
	Planation Officers	Plantation HQ
Mechanized Operation	Loggers	Plantation areas
	Planting labours	Plantation areas
Safety	Loggers	Plantation areas & Mill site
	Planting labours	Plantation areas
	Plantation Supervisors	Plantation areas & Mill site
FSC	Loggers	Plantation areas & Mill site
	Planting labours	Plantation areas & Mill site
	Plantation Supervisors	Plantation areas & Mill site
Personality development	Plantation Officers	Mill site
Sexual harassment	All the stakeholders	Plantation areas & Mill site
Workers Rights	All the stakeholders	Plantation areas & Mill site

Training schedule for HCVF

S.No.	Training Module	Target
1.	Awareness Programme on Forest Certification and FSC needs	Plantation Developers, NGOs and other stake holders
2.	Inventory, Identification and Documentation of various HCVFs	Plantation staff of TNPL
3.	Strategies for Conservation and Management of RET species	Plantation Developers and Plantation staff of TNPL
4.	Protection and Preservation of Cultural Values and other heritage sites	Plantation Developers and Plantation staff of TNPL
5.	Conservation and Management of Watershed and other protected landscapes	Plantation Developers and Plantation staff of TNPL

11.0. IDENTIFICATION AND CONSERVATION OF GREY SLENDER LORIS AT TNPL UNIT-II

Introduction

The Grey slender loris (Loris lydekkerianus) is one of the nocturnal primates found in India. Commonly found in the tropical scrub and deciduous forests as well as the dense hedgerow plantations bordering farmlands of Southern India and Sri Lanka, the Slender Loris is a small, nocturnal primate. It prefers to inhabit thick, thorny bushes and bamboo clumps where it can evade predators and also find insects, which is the main diet. Although the distribution and abundance of the species is known for the state of Karnataka and some parts of Tamil Nadu, Kerala and Andhra Pradesh, full distributional extent of the species in southern India, population densities and factors affecting its abundance still remain largely unknown. The dry forest sub-species are thought to be occurring in higher abundance in Eastern Ghats and eastern fringes of Western Ghats, its full distribution extent and conservation status is unknown.

These animals are about 25 cm long and have long, thin arms. They weigh around 275 grams. They have a small, vestigial tail. Their most prominent feature is the pair of two large, closely set, brown eyes. Being arboreal, they spend most of their life on the trees. Though their movements are slow, they can climb up fast to the tree top when threatened. They either hunt on their own or in pairs. They are known to be very social at dusk and dawn, interacting with others of their own. Their mating season is twice a year, from April to May as well as October to November. Gestation is 166-169 days. The females give birth to normally one and rarely two infants at one time. The mother carries the infants constantly during the first few weeks after birth. They live between 12-15 years. Historical biogeography indicates that the species is limited by River Tapti on the west coast and River Godavari on the east coast based on the

secondary information and from the collection localities of museum specimens. The south eastern and south western limits of distribution of lorises are still unclear and the distribution pattern poses problems because of the complexity in the geomorphology of Southern India.

Diet

All subspecies have been observed to have an almost entirely insectivorous diet composed of ants and termites. They also consume a large variety of other arthropods, including other insects such as beetles, mollusks, spiders, and the occasional small vertebrate. Grey slender loris is able to use its long and slender fingers to forage for insects within trees and insect hives. The most common displayed hunting behavior is through visual detection, sniffing, smell, and ear retraction. They tend to have a very slow, meticulous approach to foraging. They use their strong grip with one hand to hold onto a branch or surface and the other to extract or grab the insect, crushing it in their hand. Researchers have observed them directly consuming prey, rather than killing before consumption.

Diet plays a large role in the population density of these primates. There is positive correlation between densities of Grey slender lorises to density of insect populations. Basically, where there are more insects or large insect's hills, there are more Grey slender lorises. While this may seem obvious, it shows that they do not always travel far distances to find food; rather, they nest or stay closer to areas with more insects.

Apart from insects they are also known to eat leaves, flowers, slugs and sometimes eggs of birds. Among the strange habits they have is the urine washing of their face and limbs, which is thought to soothe or defend against the sting of the toxic insects they prefer to eat. These animals face a threat from poachers due to the misplaced belief that these animals have magical and medicinal powers. This hunting, along with destruction of their habitat, is their major threat. There are no confirmed numbers on how many slender lorises survive in the wild. They are one of the least studied of all primates in India.

Behavior and Lifestyle

Grey slender lorises are nocturnal primates, meaning they are most active at night. Most loris species are completely solitary; however the Grey slender loris is highly socially active. During the day, they sleep in social groups of up to seven. They form what researchers have called a "sleeping ball" or "sleeping pod," where they connect limbs and tangle up.

During dusk hours they groom each other, which form social bonds. This behavior is observed in several other species of primates. Play between juvenile members of the group is common and includes jumping, chasing, and vocalizations. Social activity is observed between adult males and females and between adults and juveniles, but hardly between adults of the same sex. This is most likely due to competition or group dynamics and group roles.

Daily Life and Group Dynamics

Daily life for these small prosimians is comprised of foraging, social play, inactivity, and traveling. Researchers have observed that they spend up to half of their time in each other's presence and less than half of their time inactive, while the rest of their time is spent traveling for food and grooming. More often than not, adult males and females will go off and forage alone at night, while males periodically return and check up on the parked juveniles, as they do not forage for themselves until maturity is reached around the age of 10-15 months. They have been observed occasionally traveling and foraging in pairs, which suggest that, from time to time, they are able to maximize food collection in pairs. Research done on sleeping groups has suggested that they live in a multi-male social system, which means that there is more than one male present in each group. Groups are made up of about seven individuals, which include offspring, at least one female, and at least a pair of adult males.

Grey slender loris is not monogamous, which means that they participate in a mating system in which they have more than one mating partner. During the few active times throughout the day and evening, the females spend part of the time looking after the newborn, which are dependent upon them for the first 10 weeks after birth.

Communication

The affably social Grey slender loris keeps up its social behavior through repeated loud calls throughout the night. These calls range from steady pitched "whoops" to lower pitched "growls." These calls are social in nature, strengthening social bonds, and also are meant to gauge location. The social networking of the Grey slender loris is not Twitter, but is their loud and persistent calls to one another. Grey slender lorises also use these whoops and higher pitched screams to alert the group to predators. They are not fast-moving animals, so they depend on these alarm calls to avert potential danger.

Males competing with each other for females use a series of aggressive vocalizations such as growling, chittering and whistling. When a female decides she is uninterested, she emits these vocalizations to the males. When a male follows a female he is sexually interested in, he will use consistent vocalization patterns to try and draw her attention.

Even the youth have a complex system of vocalizations that mean certain things. At nighttime just before dawn, a juvenile emits a loud "zic" sound to alert the mothers of their whereabouts. They also vocalize playful noises while playing with one another or while being groomed. The vocalizations and specific meanings of certain calls suggest that the communication system of the Grey slender loris is very intelligent and complex.

Many nocturnal primates rely on olfactory senses and cues. Researchers presume that, like other lorises, the Grey slender loris uses brachial gland secretions to mark home territory and travel routes.

Reproduction and Family

Grey slender loris has a polygynandrous mating system, meaning that both males and females have multiple breeding partners within a breeding season. Researchers disagree on when or if there is a specific breeding season, but there is a general consensus that females have a gestation period of about 5.5 months. Females have the potential to birth up to 4 children per year. Mating behaviors between males and females are social behaviors. A male shows interest in a female by increasing grooming frequency, sounding more frequent vocalizations and following the female. Males often follow a foraging female for hours. Competition between males following the same female occurs. Confrontational vocalizations such as "growls" often occur between competing males. Physical violence between males such as chasing has also been observed.

When a female permits a male to mate with her, the sexual encounter lasts from around 3-11 minutes. Oftentimes a female take on consecutive partners, meaning that when one male is done copulating another will immediately follow. Mating sessions can last up to 12 hours.

Most mothers give birth to one single infant or to twins. There is an equal probability that they will have either 1 or 2 offspring. Mothers have two sets of nipples, which especially help them if they must feed twins and possibly other youths. For the first four weeks of life, infants cling to their mothers. After four weeks, mothers begin to leave their young at the nesting site at night. It is then the males' responsibility to check on the young throughout the night. Researchers have concluded that adult males only check on youths that are in the same sleeping ball as them, which strengthens the social significance of their sleeping patterns. They reach maturity at around 10-15 months, with females reaching sexual maturity quicker.

Ecological Role

Grey slender loris impacts insect populations due to its insectivorous diet and foraging. The populations of certain insects are very much affected by the amount of Grey slender lorises present in the area. They are still a part of the food web, and can be hunted and eaten by larger predators in their habitat.

Identification and Assessment of status of Grey Slender Loris at TNPL Unit-II

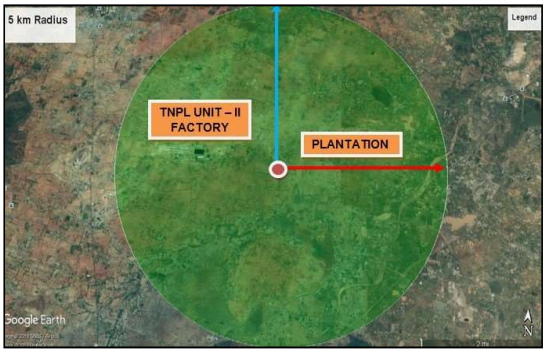
A systematic study was conducted to assess Grey slender loris status in terms of movement and habitat use of the species at Tamil Nadu Newsprint Paper Limited Unit II, Mondipatti Village, Manapparai Taluk, Trichirappalli district.

Fig. TNPL Unit II block wise map

Table. List of blocks in TNPL Unit II with area (In acres)

Sl.No.	Block Nos	Area (in acres)
1	Block 1	48.50
2	Block 2	44.50
3	Block 3	47.50
4	Block 4	43.00
5	Block 5	34.00
6	Block 6	59.00
7	Block 7	50.00
8	Block 8	35.00
9	Block 9	38.00
10	Block 10	38.00
11	Block 11	31.00

Fig. The 5 kilometer radius selected for Grey slender loris survey



The villages recorded for studying the Grey slender loris population around the four directions of the TNPL Unit II were North east (Kuppanarpatti, Muthanaampatti, Pillur, Kaarnaampatti, Kilaveliyur, Vellivadi, Kavalkaranpatti, Chellakadiganpatti and Chettichethrampatti), North west (Nottakaranpatti, Pathiripatti, Kalladai road, Thirumanickampatti, Vellappatti, Ulathupatti, Poongudipatti), South east (A.pattiputhur, Siddhanantham, Maravanur, Azhagipatti, Thergopatti, Vadakku Serpatti, Periyarpati and A.puthur) and South west (Muthhapuliyanpatti, Periyarpati, Satthirapatti, Kalathupatti, Kottapatti, Nariyampatti, Chinnarettipatti and Kalingapatti).

The TNPL UNIT – II plantation was enriched with **Grey slender loris population**, therefore a separate survey was conducted for managing them in future. The survey was conducted with the help of the M.Sc. (Forestry) graduates from Forest College and Research Institute (TNAU), Mettupalayam, Coimbatore Dist. **Night surveys** were conducted between 20:00 hours and 04:00 hours on pre-determined transects using flashlights and headlamps. Existing natural trails were used as transects in the plantations and nearby villages for the surveys following best recommendations. The transect length will be 1500 m, transect even gone beyond our physical target area. The care will be taken that transects midpoint should cross on the target area. Survey will be made to count the number of Grey slender loris along transect. The eyes of Grey slender loris gives a typical orange-red shine in response to a flashed light that can be seen from a distance of over 100 m and this was used to detect the presence of the Grey slender loris. Vehicle survey or the foot transect was adopted and followed depending on the access and topography of the terrain for the surveys. Vehicle speed was maintained at an average of 5 kms/hours, whereas foot transects was done with an average speed of 1 km/ hour. Actual density estimation requires transects to be replicated to fulfill the statistical assumptions.
The relative density of Grey slender loris was calculated using following formula.

$$\text{Relative density (\%)} = \frac{\text{Density of individual species}}{\text{Total density of all the species}} \times 100$$

Nocturnal Survey In TNPL Unit-II

Findings

The Grey slender loris survey on TNPL UNIT – II, Manapparai, Trichirappalli was carried out with the help of the M.Sc. (Forestry) graduates from Forest College and Research Institute (TNAU), Mettupalayam. The GPS location of the sighted Grey slender loris in all the three seasons, viz., Pre-monsoon, monsoon and post-monsoon were listed and presented in the Tables 7 to 9. In Post-monsoon season, totally 11 Grey slender loris was sighted with maximum sightings in block 1 (Tectona grandis – 2 Nos.) with relative density of 18.18 per cent and block 3 (Commiphora berryi – 2 Nos.) and single sightings in the tree species associated are Thespesia populnea, Cocos nucifera, Acacia auriculiformis, Azadirachta indica, Eucalyptus hybrid & Khaya senegalensis with lowest relative density of 9.09 per cent (Table 1).

In Pre-monsoon season, totally 9 Grey slender loris was sighted with the equal distribution in all the tree plots viz., Tectona grandis, Enterolobium cyclocarpum, Azadirachta indica, Thespesia populnea, Neolamarckia cadamba, Dalbergia sissoo, Eucalyptus hybrid, Dalbergia sissoo and Terminalia catappa with the relative density of 11.11 per cent (Table 2).

Table 1. Quantitative character of Grey slender loris in TNPL UNIT – II, Manapparai, Trichirappalli with the GPS points and tree association during Post-monsoon

Sl. No.	Block	Tree Species	GPS Point	Individuals (Nos.)	Relative density (%)
1	I	*Tectona grandis*	N 10.68602 E 78.47996	2	18.18
2	V	*Thespesia populnea*	N 10.69258 E 78.47998	1	9.09
3	III	*Thespesia populnea*	N 10.69555 E 78.22833	1	9.09
4	II	*Cocos nucifera*	N 10.68781 E 78.46856	1	9.09
5	VI	*Acacia auriculiformis*	N 10.70305 E 78.48005	1	9.09
6	III	*Azadirachta indica*	N 10.69194 E 78.48750	1	9.09
7	X	*Eucalyptus hybrid*	N 10.69388 E 78.49027	1	9.09
8	III	*Commiphora berryi*	N 10.69048 E 78.47059	2	18.18
9	I	*Khaya senegalensis*	N 10.69257 E 78.45027	1	9.09

Table 2. Quantitative character of Grey slender loris in TNPL UNIT – II, Manapparai, Trichirappalli with the GPS points and tree association during Pre-monsoon

Sl. No.	Block	Tree Species	GPS Point	Individuals (Nos.)	Relative density (%)
1	I	*Tectona grandis*	N 10.68641 E 78.45638	1.00	11.11
2	III	*Enterolobium cyclocarpum*	N 10.68861 E 78.46975	1.00	11.11
3	III	*Azadirachta indica*	N 10.68890 E 78.46997	1.00	11.11
4	III	*Thespesia populnea*	N 10.69158 E 78.48015	1.00	11.11
5	VI	*Neolamarckia cadamba*	N 10.68930 E 78.47043	1.00	11.11
6	VIII	*Dalbergia sissoo*	N 10.68991 E 78.48468	1.00	11.11
7	IX	*Eucalyptus hybrid*	N 10.69206 E 78.48466	1.00	11.11

8	X	*Dalbergia sissoo*	N 10.69501 E 78.48593	1.00	11.11
9	III	*Terminalia catappa*	N 10.68917 E 78.47498	1.00	11.11

In monsoon season, totally 12 Grey slender loris was sighted with the equal distribution in all the tree plots viz., Tectona grandis, Commiphora berryi, Azadirachta indica, Thespesia populnea, Dalbergia sissoo, Eucalyptus hybrid and Dalbergia sissoo with the relative density of 8.33 per cent in all the plots equally (Table 3).

Table 3. Quantitative character of Grey slender loris in TNPL UNIT – II, Manapparai, Trichirappalli with the GPS points and tree association during monsoon

Sl. No.	Block	Tree Species	GPS Point	Individual (Nos.)	Relative Density (%)
1	III	*Azadirachta indica*	N 10.66909 E 78.49419	1.00	8.33
2	III	*Azadirachta indica*	N 10.73582 E 78.40715	1.00	8.33
3	III	*Azadirachta indica*	N 10.71134 E 78.54070	1.00	8.33
4	III	*Azadirachta indica*	N 10.71574 E 78.46329	1.00	8.33
5	III	*Commiphora berryi*	N 10.69017 E 78.44624	1.00	8.33
6	III	*Commiphora berryi*	N 10.69014 E 78.44553	1.00	8.33
7	III	*Commiphora berryi*	N 10.69154 E 78.46563	1.00	8.33
8	I	*Tectona grandis*	N 10.68621E 78.45738	1.00	8.33
9	VIII	*Dalbergia sissoo*	N 10.68361E 78.48345	1.00	8.33
10	VIII	*Melia dubia*	N 10.75637 E 78.47445	1.00	8.33
11	III	*Thespesia populnea*	N 10.69158 E 78.48015	1.00	8.33
12	IX	*Eucalyptus hybrid*	N 10.69206 E 78.48466	1.00	8.33

Comparing all the three season (Pre-monsoon, monsoon and post-monsoon), the minimum Grey slender loris was sighted during the post-monsoon (with 11 Nos. followed by 9 Nos. of sighting during pre-monsoon and maximum Grey slender loris was recorded during monsoon with 12 Nos. It is interesting to note that Grey slender loris was observed mostly in IIIrd block of TNPL UNIT – II, Manapparai, Trichirappalli that to in tree plot of Neem (Azadirachta indica) and Commiphora berryi.

Conservation Measures

- Regular and repeated awareness to be given to the TNPL Unit - II employees and surrounding villagers regarding the vehicle speed in Grey slender loris living areas
- The sign boards to be mounted in the TNPL UNIT – II to know the importance of the Grey slender loris and its benefits.
- The tree cover at TNPL Unit-II may be increased inorder to create natural habitat for slender loris

- Undertaking outreach activities to sensitize local communities, which may be carried out by a network of TNPL unit II employees and college & school student near the villages, which will eventually helps in improving the population status of Grey slender loris

Fig. Grey slender loris in tree species at TNPL UNIT – II

Fig. Sign boards indicating the importance of Grey slender loris

Fig. British Period Ammunition Structure found nearby TNPL Unit-II

12.0. DOCUMENTATION AND DISSEMINATION PLAN

The industry has established a system to document the plan of action, developments, programme and other related activities and make them available to the public and other stakeholders through the following methods.

Communication and involvement of relevant stakeholders

The Plantation Development Plan, programme, felling and transportation and other related issues are systematically communicated to all stakeholders through electronic and print media in order to benefit all partners. The Plantation unit has identified farmers, NGOs, loggers and transportation sector and officials from line department (Forest Dept, TAFCORN, Agrl. Dept, Revenue Dept) as Major stakeholders and all these stakeholders are periodically apprised with the state of art developments in plantation sector through meetings and also through electronic and print communication.

Publication in Books and Bulletins

The Plantation Schemes of TNPL and the Production technologies are periodically updated and published in regional and local languages in the form of books and bulletins.

Publication of Scientific paper

The Industry has a plan to periodically publish the outcomes of plantation research and development in the journals of National and International repute besides publishing in scientific books and periodicals.

Documentation through Website

All the plantation development plan and programme are periodically uploaded in the website for the benefit of farming communities and others interested in tree promotion activities.

Photographic documentation

The industry has a plan to document all technologies, programmes and plan in the form of permanent photographic record and this will be available in the CPRC for reference.

Creation of Digital Records

All the plantation activities of the Department will be digitized and a digital library will be created a ready reckoner for use by all levels of stakeholders.

Preparation of annual status reports

The plantation department is preparing annual status reports by engaging an external agency and assessed periodically the status of plantation. These annual reports are made available to the public both as hard and soft copies. The reports are also periodically uploaded in the website for wider reference.

12.1. Compliance with laws & ratified conventions

TNPL is an independent legal entity and it is complied with relevant legal obligations as per the standard designed by government legislative policy and follows the relevant principles and policies applicable to plantation schemes.

The various international and national laws and ratified conventions related to plantation, environment, safety, labourers, etc., are given in appendix C. Based on the nature of plantation establishment/harvesting activities, the applicable elements of these laws will be adopted in TNPL plantation activities. However, CITES is not applicable for TNPL since there will not be any trade of CITES species. TNPL also conserving the Grey slender loris present on its UNIT-II captive plantation areas.

13. PERIOD OF MANAGEMENT PLAN AND INTERMEDIATE REVISION:

This Management plan will be followed for 15 years from 2021 onwards. Since scientific technologies and methodologies are fast improving, when it is found necessary to update the plan periodically midterm revision may also be considered if it becomes necessity. Also if any suggestion or improvement strategies given in the Environmental Impact Assessment that will be incorporated in the management plan through midterm revision.

TNPL management plan will be update and revise periodically the management planning and procedural documentation to incorporate the results of monitoring and evaluation, stakeholder engagement or new scientific and technical information, as well as to respond to changing environmental, social and economic circumstances.

The Management Plan will be revised and updated periodically consistent with Annex E of FSC-STD-IND-01-2022 EN to incorporate:

1. **Monitoring results, including results of certification audits;**

   If we are getting any substantial outcome to be covered through monitoring and certification audit, this management plan will be updated to include the same accordingly. For example, based on outcome monitoring results we have included the monitoring of Grey slender loris (HCVF) as one of the monitoring indicators in our monitoring plan.

2. **Evaluation results;**

   Based on results of various evaluations like socio-economic assessment, environmental assessment, if any points to be addresses (or) to be added in monitoring the management plan will be updated after incorporating in monitoring indicators.

3. **Stakeholder engagement results;**

   If we are getting any inputs/results from stakeholder engagement which is substantial magnitude in nature that will be incorporated in the management plan to comply the FSC standards. Accordingly, this management plan will be revised and implemented.

4. **New scientific and technical information:**

   If any new scientific and technical information which are related to quality management of plantations and need to be followed for better output, that scientific & technical information will be added in this management plan which will be revised accordingly.

5. **Changing environmental, social, or economic circumstances**

   Any changes related to environmental, social or economic circumstances which will have significant impact will be incorporated in TNPL plantation management plan by interim revision. For example, we have included the wages to be paid to workers, long-term economic viability in monitoring indicators to monitor the socio-economic importance of TNPL plantation scheme and this management plan revised accordingly.

While revising and updating the management plan, we will also refer the previous management plans and changes made in the current management plan.

Conceptual framework for planning and monitoring as per
Annex E of FSC-STD-IND-01-2022 EN

Management Plan Activities / Elements to be monitored	Management Plan revision Periodicity	Monitoring Periodicity	Responsible to Monitor	FSC Principle / Criterion
Site Plan (Harvest Plan)	Annual	While harvesting, When in the field and annually	TNPL Field officials	P10
Rate Threatened and Endangered Species	Annual if required	Annually	Outcome of HCVF Assessment and TNPL officials	P6

Management Plan Activities / Elements to be monitored	Management Plan revision Periodicity	Monitoring Periodicity	Responsible to Monitor	FSC Principle / Criterion
Annual Harvest	Annual	Annually	Administrative officials & Field Officials	C5.2
Insect Disease Outbreaks	Based on requirement	Based on Occurrence and Sample	Consulting Biologist like IFGTB	
Budgeting for various levels	Annual	Annually	Administrative Head	P5
Engagement Plan like Employment, Society Improvement & Grievances	Annual if required	Annually	Outcome of Socio Economic Assessment and TNPL Officials	P2,P3,P4
Sustainable Plantation Management	5 years	5 years	Administrative and Field officials of TNPL	P6
Allowable Annual Cut	Annual	Annually	Administrative and Field officials of TNPL	C5.2
Environmental Values	Annual if required	Annually	Outcome of Environment Impact Assessment and TNPL Officials	P6

Appendix B: Forest Stewardship Council Principles

PRINCIPLE* 1: COMPLIANCE WITH LAWS
PRINCIPLE* 2: WORKERS'* RIGHTS AND EMPLOYMENT CONDITIONS
PRINCIPLE* 3: INDIGENOUS PEOPLES'* RIGHTS
PRINCIPLE* 4: COMMUNITY RELATIONS
PRINCIPLE* 5: BENEFITS FROM THE FOREST
PRINCIPLE* 6: ENVIRONMENTAL VALUES* AND IMPACTS
PRINCIPLE* 7: MANAGEMENT PLANNING
PRINCIPLE* 8: MONITORING AND ASSESSMENT
PRINCIPLE* 9: HIGH CONSERVATION VALUES
PRINCIPLE* 10: IMPLEMENTATION OF MANAGEMENT ACTIVITIES

Appendix C: A List of applicable laws*, regulations and nationally ratified international treaties, conventions and agreements:

The following is the minimum list of applicable laws, regulations and nationally-ratified international treaties, conventions and agreements of India.

NATIONAL POLICIES AND ACTION PLANS

- The Destructive Insects and Pests Act, 1914
- The Prevention of Cruelty to Animals Act, 1960
- The Customs Act, 1962
- Customs Tariff Act, 1975
- National Forest Policy, 1988
- National Forestry Action Program, 1992
- The Destructive Insects and Pests (Amendment and Validation) Act, 1992
- National Environmental Action Plan, 1993
- Customs Tariff (Identification, Assessment And Collection Of Countervailing Duty On Subsidized Articles And For Determination Of Injury) Rules, 1995
- National Zoo Policy, 1998
- National Policy and Macro-Level Action Strategy on Biodiversity, 1999
- National Agricultural Policy, 2000
- National Population Policy, 2000
- Protection of Plant Varieties and Farmers' Rights Act, 2001
- National Wildlife Conservation Strategy, 2002
- National Water Policy, 2002
- National Seeds Policy, 2002
- Plant Quarantine Order (Regulation of Import into India), 2003
- National Environment Policy, 2006
- National Action Plan on Climate Change, 2008

- National Biodiversity Strategy and Action Plan, 2008
- National Livestock Policy, 2013
- National Agroforestry Policy, 2014
- National Biodiversity Strategy and Action Plan Addendum, 2014
- National Wildlife Action Plan 2017-2031
- National Mineral Policy, 2019
- National Conservation Strategy and Policy Statement for Environment and
- The Export and Import Policy of Government of India
- National REDD+ Strategy

CENTRAL ACTS AND RULES

Forest Conservation

- The Indian Forest Act, 1927
- Indian Forest Act, 1927 (as modified by various states)
- Forest (Conservation) Act, 1980
- Forest (Conservation) Rules, 2003
- Forest (Conservation) Amendment Rules, 2004
- The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006
- The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Rules, 2007
- The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Amendment Rules, 2012
- Forest (Conservation) Amendment Rules, 2014
- Compensatory Afforestation Fund Act, 2016
- Forest (Conservation) Amendment Rules, 2017
- Compensatory Afforestation Fund Rules, 2018
- The Indian Forest (Amendment) Act, 2017

Biodiversity

- The Biological Diversity Act, 2002
- Biological Diversity Rules, 2004

Wildlife

- The Wildlife (Protection) Act, 1972
- Wild Life (Stock Declaration) Central Rules, 1973
- Wild Life (Transactions and Taxidermy) Rules, 1973
- Wild Life (Protection) Licensing (Additional Matters For Consideration) Rules, 1983

- Recognition of Zoo Rules, 1992
- Wild Life (Protection) Rules, 1991 and 1995
- National Tiger Conservation Authority (Tiger Conservation Foundation) Guidelines, 2007
- Recognition of Zoo Rules, 2009

Coastal regulation zone

- CRZ Notification, 2011

Environmental clearance – general

- Environmental Impact Assessment Notification-2006

Environment protection

- The Environment (Protection) Act,1986
- Wetlands (Conservation and Management) Rules, 2010
- Guidelines for Declaration of Eco-Sensitive Zones around National Parks and Wildlife Sanctuaries, 2011

Air pollution

- The Air (Prevention and Control of Pollution) Act 1981

Water pollution

- The Water (Prevention and Control of Pollution) Cess Act, 1977
- The Water (Prevention and Control of Pollution) Act 1974

Noise pollution

- The Noise Pollution and Abatement Act, 1972

National Green Tribunal

- National Green Tribunal Act, 2010

Public liability insurance

- The Public Liability Insurance Act 1991

Land acquisition and relief & rehabilitation

- Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013
- Arbitration and alternative dispute resolution
- Arbitration and Conciliation Act, 1996

Labour, wages and industrial relations

- The Workmen's Compensation Act, 1923
- The Trade Unions Act, 1926
- The Payment of Wages Act, 1936
- The Children (Pledging of Labour) Act 1938
- The Employers' Liability Act, 1938
- The Weekly Holidays Act, 1942
- The Industrial Employment (Standing Orders) Act, 1946
- The Mica Mines Labour Welfare Fund Act, 1946
- The Industrial Disputes Act, 1947
- Dock Workers (Regulation of Employment) Act, 1948
- The Employees' State Insurance Act, 1948
- The Factories Act, 1948
- The Minimum Wages Act, 1948
- The Plantation Labour Act, 1951
- The Employees' Provident Fund and Miscellaneous Provisions Act, 1952
- The Working Journalists and Other Newspapers Employees (Conditions of Service) and Miscellaneous Provisions Act, 1955
- Merchant Shipping Act, 1958
- Working Journalists (Fixation of Rates of Wages Act, 1958
- The Employment Exchange (Compulsory Notification of Vacancies) Act, 1959
- The Apprentices Act, 1961
- The Maternity Benefit Act, 1961
- The Motor Transport Workers Act, 1961
- The Personal Injuries (Emergency Provisions) Act, 1962
- The Personal Injuries (Compensation Insurance) Act, 1963
- The Payment of Bonus Act, 1965
- The Beedi and Cigar Workers (Conditions of Employment) Act, 1966
- The Contract Labour (Regulation and Abolition) Act, 1970
- The Limestone and Dolomite Mines Labour Welfare Fund Act, 1972
- The Payment of Gratuity Act, 1972
- The Equal Remuneration Act, 1976
- The Sales Promotion Employees (Conditions of Service) Act, 1976
- Dangerous Machines (Regulation) Act, 1983

- The Child and Adolescent Labour (Prohibilion and Begulatbn) Act, 1986
- The Labour Laws (Exemption from Furnishing Returns and Maintaining Registers by Certain Establishments) Act, 1988
- The Building and Other Construction Workers Cess Act, 1996
- The Building and Other Constructions Workers' (Regulation of Employment and Conditions of Service) Act, 1996
- Dock Workers (Regulation of Employment) (Inapplicability to Major Ports) Act, 1997
- Private Security Agencies (Regulation) Act, 2005
- Unorganized Workers Social Security Act, 2008

Other relevant laws and rules

- The Destructive Insects and Pests Act, 1914
- The Insecticides Act, 1968
- The Insecticides Rules, 1971
- The Destructive Insects and Pests (Amendment and Validation) Act, 1992
- Plant Quarantine Order, 2003 (Consolidated version)
- Model Agricultural Produce Market Committee Act, 2003
- Model Agricultural Produce Market Committee Rules, 2007
- The Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2013
- The Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Rules, 2013
- The Farmers Produce Trade and Commerce (Promotion and Facilitation) Act 2020
- The Farmers' Produce Trade and Commerce (Promotion and Facilitation) Rules, 2020
- The Farmers Empowerment and Protection Agreement 0n Price Assurance and Farm Services Act, 2020
- Foreign Trade (Development & Regulation) Act,1992
- National Working Plan Code, 2014

INTERNATIONAL TREATIES, CONVENTIONS AND AGREEMENTS

- Convention Relative to the Preservation of Fauna and Flora in their Natural State, 1933
- International Plant Protection Convention, 1951
- International Convention for the Prevention on Pollution of the Sea by Oil, 1954
- Convention Concerning the Protection of the World Cultural and Natural Heritage, 1971
- Convention on Wetlands of International Importance, Especially as Waterfowl Habitat, 1971
- Convention on International Trade in Endangered Species of Wild Fauna and Flora, 1973
- Convention on the Conservation of Migratory Species of Wild Animals, 1979

- Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, 1989
- Convention on the Prior Informed Procedure for Certain Hazardous Chemicals and Pesticides in International Trade, 1990
- Amendments to the Montreal Protocol on Substances that Deplete the Ozone Layer, London, 1990
- Protocol on Environmental Protection to the Antarctica Treaty, 1991
- Convention on Biological Diversity, Rio de Janeiro, 1992
- United Nations Framework Convention on Climate Change,1992
- United Nations Framework Convention on Climate Change – ratified 1993
- International Tropical Timber Agreement,1994
- Agreement relating to the Implementation of Part XI of the UNCLOS 1982, 1994
- Convention to Combat Desertification in those Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa, 1994
- Protocol to the United Nations Convention on Climate Change,1997
- Cartagena Protocol on Biosafety, 2000
- Convention on Biological Diversity – ratified 1994; Cartagena Protocol on Biosafety – ratified 2003
- Stockholm Convention on Persistent Organic Pollutants – ratified 2006
- International Tropical Timber Organization – ratified 2008
- UN Framework Convention on Climate Change: Paris Agreement - ratified 2016

INTERNATIONAL LABOUR ORGANIZATION

The following information is from India's Ministry of Labour and Employment's website https://labour.gov.in/lcandilasdivision/india-ilo accessed on 1 September, 2021
Core Conventions of the ILO: The eight Core Conventions of the ILO (also called fundamental/human rights conventions) are:

- Forced Labour Convention (No. 29)
- Abolition of Forced Labour Convention (No.105)
- Equal Remuneration Convention (No.100)
- Discrimination (Employment Occupation) Convention (No.111)
- Minimum Age Convention (No.138)
- Worst forms of Child Labour Convention (No.182)
- Child Labour (Prohibition & Regulation) Amendment Act, 2016

(The above Six have been ratified by India)

- Freedom of Association and Protection of Right to Organised Convention (No.87)
- Right to Organise and Collective Bargaining Convention (No.98)

(These two have not been ratified by India)

Other ILO information

- A full list of ILO Conventions ratified by India can be accessed at: https://labour.gov.in/lcandilasdivision/india-ilo
- Safety and health in forestry work (ILO. Safety and health in forestry work: An ILO code of practice Geneva, International Labour Office, 1998. ISBN 92-2-110826-0.
- Applicable elements of UNDRIP and ILO convention 169.

India's Ministry of Environment & Forests provides a comprehensive list related to the management and protection of the environment, forests, and wildlife at: http://envfor.nic.in/legis/legis.html

Some key laws and regulations from this list that impact Forest Management in India:

- The Indian Forest Act, 1927
- The Forest Conservation Act, 1980
- The Panchayats (Extension to the scheduled Area) Act 1996 (PESA 1996)
- The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 (FRA 2006).
- The Forest Conservation Rules, 2003
- The Wildlife (Protection) Act, 1972
- The Wild Life (Specified Plants Stock declaration) Central Rules, 1995
- The Wild Life (Stock Declaration) Central Rules, 1973
- The Wild Life (Protection) Rules, 1995
- The Environment (Protection) Act, 1986
- The Water (Prevention & Control of Pollution) Act, 1974, amended in 1988
- Water (Prevention and Control of Pollution) Cess Act, 1977, amended 1992
- Air (Prevention & Control of Pollution) Act, 1981, amended in 1987
- S.O.2447(E), [23/09/2009] The Hazardous Wastes (Management, Handling and Transboundary Movement) Rules,2009,Notification
- S.O.1677(E), [28/09/2007] - Amendments to S.O. 671(E),dated 30/09/1996 Loss of Ecology (Prevention and Payments of Compensation)
- The Public Liability Insurance Act, 1991, amended 1992
- State/Union Territory Minor Forest Produce (Ownership of Forest Dependent Community) Act, 2005
- Biological Diversity Act, 2002
- Eco sensitive zone notifications: http://envfor.nic.in/legis/eco-senstive.htm

List of various Central Labour Acts in India from the Ministry of Labour and Employment (http://labour.nic.in/act/welcome.html)
Some key laws and regulations related to labour laws that impact Forest Management in India:

- The Trade Unions Act, 1926

- The Industrial Employment (Standing Orders) Act, 1946
- The Industrial Disputes Act, 1947
- The Payment of Wages Act, 1936
- The Minimum Wages Act, 1948
- The Payment of Bonus Act, 1965
- The Factories Act, 1948
- The Mines Act, 1952
- The Plantation Labour Act, 1951
- The Contract Labour (Regulation & Abolition) Act, 1970

List of rare and threatened species* in the country or region

1. The IUCN Red List of threatened species
https://www.iucnredlist.org/
2. Wild animals and bird species protected under Wildlife (Protection Act, 1972
http://www.wiienvis.nic.in/Database/ScheduleSpeciesDatabase_7969.aspx
3. Endemic and threatened plant taxa of India
http://bsienvis.nic.in/Database/E_3942.aspx
4. Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)
https://cites.org/eng/disc/text.php

Appendix D: Complaints/Inputs Procedure For Stakeholders:

STAKE HOLDER INPUTS/DISPUTES/COMPLAINTS PROCEDURE:

TNPL used culturally appropriate engagement of stakeholders ensures that they are proactively and transparently engaged in the following processes:

- Dispute resolution processes
- Definition of Living wages – It is nothing but wages which are higher than the legal minimum wages
- Identification of rights, Indigenous cultural landscapes sites and impacts
- Local communities, socio-economic development activities; and
- High Conservation Value assessment, management and monitoring.

Through culturally appropriate engagement of stakeholders, local communities TNPL developed the following disputes resolution mechanism as follows:

The stakeholders may complaint about their field problems by any one of the followings method:

- By phone call
- By registering in the compliant register available at TNPL plantation office
- By sending mail
- By sending written complaints through post/courier

The FME will provide response to the stakeholder within a period of 15 days from the date of receipt of the complaint.

If any complaint received from stakeholders through any one of the above mode, it will be registered in the complaint register as soon as received and forward to the TNPL Plantation Admin office. In some times the complaints will be received directly at TNPL Plantation Admin office. DGM (Forestry) will assess the complaints received from stakeholders and analyses the root cause of the issues. Then he will find out the solution to sort out the issues and not to occur the same issues in future. Accordingly, DGM (Forestry) put up the details about issues and solutions to get approval from CGM(Plantation, R&D) and SO, Head of Department. CGM(Plantation, R&D) and SO, analyse the issues and solutions given by DGM(Forestry) and approved the solutions for implementation.

Based on approval from CGM(Plantation,R&D) and SO, DGM (Forestry) instruct the concern field officials to sort out the issues raised by stakeholders. He will also confirm the complaints sorted out by field officials by reviewing them. This whole complaint procedure will takea time of 60 days. So if any complaint/issues raised by any of the stakeholders will be addressed within 60 days of receipt of complaint. This 60 days time period will also be informed to stakeholders through phone or letter or mail once we received the complaints from them.

Similarly, if the complaints is received from any stakeholders with respect to

damage/loss for them with supporting evidence that will be registered in the register and forwarded to TNPL Plantation admin office. It will be assessed by D GM (forestry) and he will analsye root cause for the damages/losses. In the event that evidence is considered relevant, field investigation / verification will be conducted within 60 days of receipt of the complaint under the supervision of DGM (Forestry).

After field verification, DGM (Forestry) will forward his remarks and compensations request to CGM(Plantation,R&D) and SO, for approval. CGM(Plantation, R&D) and SO, will approve the compensations based on the nature of damage/losses. Accordingly, the compensations will be paid to stakeholders within 30 days from date of report submitted by DGM(Forestry). Hence the complaints received from any stakeholders with respect to damage/loss will be addressed within 90 days from date of receipt of complaints fromany of the stakeholders

In generally the complaints received from the stakeholders in the below categories:

- For want of good quality seedlings
- For want of releasing Purchase Order to harvest their plantations
- Payment request for the pulpwood supplied by them
- Replacement for damaged or dried plants which supplied from TNPL
- Raising Pulpwood Plantations

CGM(Plantation,R&D) and SO is the competent authority to provide solutions for all the complaints received from anyone of the stakeholders. This well-structured resolving mechanism lead to consistent outcome to any of the complaints from stakeholders.

In cases where a dispute relates to the Principles and Criteria of the FSC, the certifying body will be informed immediately about the disputes and will act accordingly.

Through this systematic system Tamil Nadu newsprint and Papers Limited will addresses any complaint received from any of the stakeholders.

Contact information of the person or position responsible for addressing inputs/complaints:

Dr.R.Seenivasan
Chief General Manager (Plantation, R&D) and SO
E-mail ID: seenivasan.r@tnpl.co.in
Telephone Number : 04324 – 277001 to 277010

The CGM (Plantation, R&D) and SO is having the responsibility to sort out the disputes if any raised by any of the stakeholders who will be as Ombudsman for Plantation Implementation activities.

If the resolution given by Ombudsman is not satisfactory for any of the stakeholders then they may contact the top management of TNPL in the following address:

The Chairman and Managing Director,
Tamil Nadu Newsprint and Papers Limited, Corporate Office
Mount Road, Guindy
Chennai – 600 032.
Telephone: +91-044 – 22354415, 22354416,

Further, if the disputes are not solved, the stakeholders may take legal action in the District Court of Karur.

TNPL will cease or stop its operations and procuring FSC FM 100% pulpwood where the disputes exists of substantial magnitude or substantial duration or Involving a significant number of interests. Under these circumstances, TNPL will not continue its FSC FM operations in these selected plantations which will be excluded from TNPL FSC FM scope of certification and pulpwood from these plantations **will not be procured as FSC FM 100% material.**

If the disputes/complaints is having considerable importance, size (may be from more than 15 stakeholders, or worth, or having substance or capable of being treated as fact; not imaginary will be treated as Substantial Magnitude".

Similarly, if the we are getting atleast one dispute/complaint per day for one-week continuous period about the same particular plantation/location or reasons and which also remains for more than 15 days, that will be treated as disputes/complaints with substantial duration. If the disputes/complaints about the same particular plantation/location or reasons are received from more than 10 stakeholders will be treated as having significant number of interest.

Under these circumstances, TNPL will not continue its FSC FM operations in these selected plantations which will be excluded from TNPL FSC FM scope of certification and pulpwood from these plantations **will not be procured as FSC FM 100% material even during disputes verification period.**

In case the complaint regarding sourcing plantations then material will not be sourced as FSC 100% from the concerned field during Complaint verification period. If that area not confirming the FSC, Forest Stewardship Standard for India : FSC-STD-IND-01-2022 EN standard and corrective action cannot be determined and/or enforced, the supply from that particular area/source will be excluded from FSC 100% and treated as Uncontrolled Material.