TNPL PLANTATION 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.

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