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## TIS 14061 Indicators

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**Thailand Forest Certification Council - TFCC**

**The Federation of Thai Industries**



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## Contents

1	Scope .....	4
2	Normative references .....	4
3	Terms and Definitions .....	4-5
3.1	Audit .....	4
3.2	Accreditation Body .....	4
3.3	Certification Body .....	4
3.4	Indicator .....	4
3.5	Evidence .....	4
3.5	Feasible Exemptions.....	5
4	TIS 14061 indicators .....	5-23
4.1	Compliance with legal requirements .....	5
4.2	Appropriate maintenance of the forest plantation to be a carbon sink .....	6
4.3	Maintenance of forest ecosystem health and vitality .....	8
4.4	Maintenance and encouragement of productive functions of forests (wood and non-wood).....	11
4.5	Maintenance, conservation and appropriate enhancement of biological diversity in forest ecosystems .....	13
4.6	Maintenance and appropriate enhancement of protective functions in forest management (notably soil and water) .....	18
4.7	Maintenance of other socio-economic functions and conditions .....	19

## Foreword

The Sustainable Forest Plantation Management – Requirements (TIS 14061) is the national standard of Thailand with compatible to the requirement of standard for Sustainable Forest Management (PEFC ST 1003) of the Programme for the Endorsement of Forest Certification (PEFC). Certainly, TIS 14061 has adopted by related Technical Committee and stakeholders with the consideration of Thailand Context and the capability of real implementation. This is to ensure that the requirements of TIS 14061 can be able to implement for sustainable forest plantation management in Thailand.

According to TIS 14061, Chapter 3 shows that the general requirements for sustainable forest plantation management shall:

3.1 Include management and performance requirements that are applicable at forest management unit level or at another level where appropriate, to ensure that the forest is able to achieve the purpose of the requirements.

3.2 Be clear, objective-based and auditable;

3.3 Apply to activities of all operators in the defined forest area who have a measurable impact on achieving compliance with the requirements;

3.4 Require record – keeping that provides evidence of compliance with the requirements of sustainable forest management standards.

Thailand Forest Certification Council (TFCC) established the TIS 14061 Indicators (TFCC PD 001:2019) with proposes of:

1. Clarify the implementation, according to the requirements of TIS 14061 for management and performance requirements that are applicable to forest plantation management.

2. Clarify the record – keeping system for the evidences of the implementation, according to the requirements of TIS 14061.

3. Purpose to forest plantation entrepreneur for establishing sustainable forest plantation management system together with applying to auditing process for other Accreditation Body or Certification Bodies within Thailand Context.

According to Thailand Forest Certification System (TFCS), this document shall be used together with TIS 14061 in order to show the implementation of TIS 14061. However, forest plantation entrepreneur shall apply for implementation and be able to show more audit evidences to perform the conformity evaluation of the standard requirements.

## **1.Scope**

This document shows the indicators of Sustainable Forest Plantation Management – Requirements (TIS 14061) for forest plantation entrepreneur or forest manager, certification body (CB) and accreditation body (AB) in applying.

Forest plantation entrepreneur or forest manager shall apply this document together with TIS 14061, and CBs shall apply in terms of auditing process, according to TIS 14061.

## **2. Normative references**

- TIS 14061, Sustainable Forest Plantation Management – Requirements

## **3. Terms and definitions**

All terms and definitions are referred to TIS 14061 with more terms and definitions as following:

### **3.1 Audit**

A process in which is systematic, independent and documented process for obtaining audit evidence and evaluating it objectively to determine the extent to which the audit criteria are fulfilled.

### **3.2 Accreditation Body**

The independent body, generally known as an accreditation body, to accredit certification body and to show the capability of certification body in the process of certification activities, such as the accreditation of the Sustainable Forest Plantation Management – Requirements (TIS 14061).

### **3.3 Certification Body**

The third-party conformity assessment body operating certification schemes such as the certification of the Sustainable Forest Plantation Management – Requirements (TIS 14061).

### **3.4 Indicator**

Information in which the measurement or indication mechanism how to implement TIS 14061 indicators for applying by forest plantation entrepreneur or forest manager, and for auditing by certification body and accreditation body, according to TIS 14061.

### **3.5 Evidence**

In terms of record, factsheet or other information, related to audit criteria, and can be able to the verification process by considering to document, record, observation and interview. Audit evidence can be in patterns of qualitative or quantitative issues.

### 3.6 Feasible Exemptions

According to appendix in TIS 14061, criterion 4.2.1, 4.3.1, 4.3.3, 4.4.6, 4.4.8, 4.5.1, 4.5.7, 4.7.4, 4.7.5, 4.7.7 and 4.7.13 small economic plantations shall follow the indicators in each criterion, where only (S) shall apply for small economic plantation in order to comply with the relevant criteria.

## 4. TIS 14061 indicators

### 4.1 Compliance with legal requirements

**4.1.1 Forest plantation management shall comply with legislation applicable to current local, country and international laws which deals with the protection of nature, the environment, the reserved species and the endangered species, tenure and land-use rights for indigenous peoples, health, labor and safety issues and the payment of royalties and taxes.**

#### Indicators

1. Evidences of forest plantation boundaries and sizes.
2. Evidences of planted species and quantities.
3. Evidences of land tenures and related documents.
4. Evidences of land use rights and permits together with the payments of royalties and taxes.

(If any)

5. Evidences of law and compliance assortment from any other related organizations, not only domestic, but also national and international levels in patterns of law and regulation such as Thailand legal compliance framework or FLEGT, ILO (including C87 and C98).

6. Evidences of periodic review for law and compliance master list for updating presently together with the compliance process and responsible person assigned.

7. Evidences of law and compliance implementation and monitoring with the eventual results and evidences of labour expenses payment. (If any)

8. Evidences of Thai Laws related to forest plantation management activities.

**4.1.2 Forest plantation management shall provide for adequate protection of the forest plantation from unauthorized activities such as illegal logging, illegal land use, illegally initiated fires, and other illegal activities.**

#### Indicators

1. Forest plantation mapping with details of forest plantation boundaries.
2. Forest plantation landmarks or signs with details of forest plantation boundaries.
3. Evidences of definition and types of unauthorized activities together with risk assessment guideline and summary. (If any)
4. Forest plantation management plan of protecting, communicating, monitoring and evaluating

measures for unauthorized activities. (If any)

5. Evidences of forest plantation observation and unauthorized activity monitoring and measurement.

#### **4.2 Appropriate maintenance of the forest plantation to be a carbon source**

**\*4.2.1 Forest plantation management planning shall aim to maintain or increase forest areas and conserve the existing native tree (if any) and enhances the quality of the economic, social and environment of the forest plantation including soil and water. This shall be done by making full use of related services and tools that support land-use planning and nature conservation.**

##### Indicators

(S)1. Forest Plantation Management Plan, or its equivalent based on the size and use, shall provide:

- Description of current condition of FMU
- Long term objectives of FMU
- Harvesting and planting plan, according to rotation less than 10 years (short term).
- Harvesting and planting plan in long term.

(S)2. Forest Plantation Management Plan which identify of buffer zones and set-aside areas, dedicated to environmental, ecological, cultural and social functions, in the preparatory stage for plantation establishment, (if any)

(S)3. Evidence of consideration for the conversion of abandoned agricultural and treeless land into forest plantation land, whenever it can add economic, ecological, social and/or cultural value.

**4.2.2 Forest plantation management shall comprise the cycle of inventory and planning, implementation, monitoring and evaluation include an appropriate assessment of the social, environmental and economic impacts of forest management operations. This shall form a basis for a cycle of continuous improvement to minimize or avoid negative impacts.**

##### Indicators

1. Evidences of wooded productivity survey and harvesting productivity.
2. Evidences of public complaints and solving problem process and implementation, related to negative social and environmental impacts.
3. Evidences of monitoring, evaluation, and improvement for annual implementation plans.

**4.2.3 Inventory and mapping of forest plantation resources shall be established and maintained, adequate to local and national conditions and in correspondence with the topics described in this document.**

##### Indicators

1. Evidences of wooded productivity inventory and annual allowable cut, including its justification and, where relevant, the annually allowable exploitation of non-timber forest product (if

any). For small plantations may clear cut of planted trees, when provide regeneration plan, depend on scale risk and intensity.

2. Mapping of forest plantation resources in which is appropriate to local and national conditions and any other related in this standard and requirements.

**4.2.4 Management plans shall appropriate to the size and use of the forest plantation area, shall provide details and define the responsible person clearly, periodically updated. The summary of management plan shall be made available for public viewing.**

Indicators

1. Forest plantation management plan with appropriate to the size and use of the forest areas and periodically updated.

2. Forest plantation management plan and implementation.

3. Public information for the summary of forest plantation management plan including the forest management measures.

**4.2.5 Monitoring of forest plantation resources and evaluation of their management shall be periodically performed, and results fed back into the planning process.**

Indicators

1. Evidences of forest plantation management plan and implementation together with monitoring and evaluation process with periodically updated. Likewise, there are evidences of preventive and corrective actions just in case of nonconformity as indicated into forest plantation management plan

**4.2.6 Conversion of forests to other types of land use, including conversion of primary forests to forest plantations, shall not occur unless in justified circumstances where the conversion:**

**a) is in compliance with national and regional policy and legislation relevant for land use and forest management; and**

**b) entails a small proportion of forest type; and**

**c) does not have negative impacts on threatened (including vulnerable, rare or endangered forest ecosystems, culturally and socially significant areas, important habitats of threatened species or other protected areas; and**

**d) makes contribution in long-term conservation, economic, and social benefits.**

Indicators

1. Evidence of land tenure, land use rights and permits.

2. Forest plantations established by a forest conversion after 31 December 2010 in other than “justified circumstances” are not eligible for certification.

**4.2.7 Responsibilities for sustainable forest plantation management shall be clearly**

**defined and assigned.**

Indicators

1. Evidences of authorities and responsibilities as in forest plantation management plan for responsible person assigned, described by organization chart and job description. Organization chart and job description can be replaced by other practical practices for small plantation.

**4.2.8 Forest management practices shall safeguard the quantity and quality of the forest resources in the medium and long term by balancing harvesting and growth rates, and by preferring techniques that minimize direct or indirect damage to forest, soil and water resources.**

Indicators

1. Evidences of investigation and assessment of harvesting plan and regeneration plan by balancing to the productivity incremental rate as appropriate. For small plantations may clear cut of planted trees, when provide regeneration plan, depend on scale, risk and intensity.

2. Evidences of forest plantation management techniques, following to silvicultural practices or academic publications.

**4.2.9 Forest plantation management shall apply the silvicultural means appropriately to maintain or reach a level of the growing stock that is economically, ecologically and socially desirable.**

Indicators

1. Evidences of silvicultural system management of various type of tree plantation.
2. Appropriate silvicultural measures for forest plantation management.

**4.3 Maintenance of forest ecosystem health and vitality**

**4.3.1 Forest plantation management planning shall aim to maintain and increase the health and vitality of forest ecosystems and to rehabilitate degraded forest ecosystems, whenever this is possible by silvicultural means.**

Indicators

1. Forest plantation management plan describes the maintenance and increase of health and vitality of forest ecosystems.

2. Map of forest plantation resources describes the degraded forest areas (If any)

3. Guidelines of rehabilitation of degraded forest ecosystems by applying silvicultural systems. (If any)

(S) 4. Forest Plantation Management Plan which identifies buffer zones and set-aside areas, which aim to maintain and increase the health and vitality of forest ecosystems in the preparatory stage for plantation establishment

**4.3.2 Forest plantation management plans or their equivalents shall specify ways and means**

**to minimize the risk of degradation of and damages to forest ecosystems. Forest management planning shall make use of those policy instruments set up to support these activities.**

Indicators

1. The organizational policy for supporting activities in order to minimizing risks of degradation and damages of forest ecosystems.
2. Evidences of survey results for risk management of forest degradation and damages.
3. Forest management plantation plan shall provide:
  - The risk minimization of degradation and damages to forest ecosystems.
  - Species selection, land preparation, harvesting and transportation for less impact to forest plantation and soils.
  - Chemical usage as necessary by applying silvicultural system as appropriate.

**4.3.3 Forest plantation management practices shall make best use of natural structures and processes and use preventive biological measures wherever and as far as economically feasible to maintain and enhance the health and vitality of forest plantations. Adequate genetic, species and structural diversity shall be encouraged and/or maintained to enhance the stability, vitality and resistance capacity of the forests to adverse environmental factors and strengthen natural regulation mechanisms.**

Indicators

1. Evidences of natural structures and processes and use preventive biological measures.
- (S)2. Forest plantation practices which identify of buffer zones and set-aside areas and that the zoning shall be identified at the preparatory stage of the plantation establishment including provides:
  - Guidelines of natural processes and biological measures for enhancing the stability, vitality and resistance capacity of forest plantation.
  - Guidelines for conserving genetic, species and structural diversity and health and vitality of forest plantation such as using organic fertilizer or chemical and pesticide minimization and control.

**4.3.4 Health and vitality of forest plantation shall be periodically monitored, especially key biotic and abiotic factors that potentially affect health and vitality of forest plantation ecosystems, such as pests, diseases, fire, and damage caused by climatic factors or by forest plantation management operations.**

Indicators

1. Evidences of survey effects of forest health and vitality for forest ecosystems such as pests, diseases, fire, climatic factors or air pollutants.
2. Evidences of preventive and corrective actions for solving the potentially effects for health and vitality of forest ecosystems together with periodically monitoring, following to the forest plantation management plan.

**4.3.5 The monitoring and maintaining of health and vitality of forest ecosystems shall take into consideration the effects of naturally occurring fire, pests and other disturbances.**

Indicators

1. Evidences of survey effects of naturally occurring fire, pests and other disturbances.
2. Evidences of preventive and corrective actions for solving the effects for health and vitality of forest ecosystems.

**4.3.6 Lighting of fires shall be avoided and is only permitted if it is necessary for the achievement of the management goals of the forest plantation management unit.**

Indicators

1. Evidences of implementing guideline for lighting avoidance and permit such as fire prohibition signs or fire permits and controls in some activities as necessary.

**4.3.7 Appropriate forest plantation management practices such as reforestation and afforestation with tree species and provenances that are suited to the site conditions or the use of tending, harvesting and transport techniques that minimize tree and/or soil damages shall be applied. The spillage of oil during forest plantation management operations or the indiscriminate disposal of waste on forest plantation land shall be strictly avoided. Non-organic waste and litter shall be avoided, collected, stored in designated areas and removed in an environmentally-responsible manner.**

Indicators

1. Evidences of forest plantation implementations:
  - Specie selection, land preparation, harvesting and transportation with less effect to forest plantation and soils.
  - Forest management practices for reforestation and afforestation system.
  - Guidelines or requirements of oil spillage prevention and control during forest plantation operations.
  - Guidelines or practices of waste collection and management.
2. Evidences of awareness training for forest ecosystem impacts from forest plantation activities.
3. Evidences of oil spillage monitoring during forest plantation operations. (If any)
4. Evidences of waste collection and management by means of waste segregation, separation, collection, management and disposal, especially for inorganic waste and garbage in forest plantation areas.

**4.3.8 The use of pesticides shall be minimized and appropriate silvicultural alternatives and other biological measures preferred. The WHO Type 1A and 1B pesticides and other highly toxic pesticides shall be prohibited, Include other toxic pesticides maybe accumulate in the food**

**chain in any case.**

Indicators

1. Name list of all pesticides used in forest plantation operations, compared with WHO Recommended Classification of Pesticide by Hazard and Guideline to classification and pesticides banned by international agreement (pesticides banned by international agreements are defined in the Stockholm Convention on Persistent Organic Pollutants 2001, as amended)

2. Evidences of pesticide quantity used.

**4.3.9 The use of pesticides shall follow the instructions given by the pesticide producer and be implemented with proper equipment and training.**

Indicators

1. Name list of all pesticides used in forest plantation operations.

2. Evidences of chemicals and pesticides used, following to the labeled instruction such as using, storing and disposing.

3. Evidences of pesticide materials and equipment together with personal protective equipment (PPE) provided for pesticide working properly and safety, according to the labels, laws and regulations.

4. Evidences of training records for workers or contractors, using pesticide materials and equipment together with personal protective equipment (PPE) correctly and safely.

5. Name list of personal protective equipment (PPE) used for pesticide working in forest plantation operations.

**4.3.10 Where fertilizers are used, they shall be applied in a controlled manner and with due consideration for the environment.**

Indicators

1. Name list of chemicals, organic and inorganic fertilizers for forest plantation operations.

2. Evidences of fertilizer implementations for using, storing and disposing of waste containers with care and share to the environment.

3. Evidences of inorganic fertilizers records, stores and disposal of waste containers for forest plantation operations.

**4.4 Maintenance and encouragement of productive functions of forests (wood and non-wood)**

**4.4.1 Forest plantation management planning shall aim to maintain the capability of forests to produce a range of wood and non – wood forest products and services on a sustainable basis.**

Indicators

1. Products list of forest plantation in short and long terms together with appropriate productivity indicators of forest plantation, including with wood and non-wood.

2. Forest plantation management plan covered to planting, tending, inventory and productive estimation in short and long terms.

**4.4.2 Forest plantation management planning shall aim to achieve sound economic performance taking into account any available market studies and possibilities for new markets and economic activities in connection with all relevant goods and services of forests.**

Indicators

1. Marketing information and forest products in present time and plan in the future.
2. Forest plantation management plan is corresponding with marketing plan.

**4.4.3 Forest plantation management plans shall take into account the different uses or functions of the managed forest plantation area (wood and non – wood). Forest plantation management planning shall make use of those policy instruments set up to support the production of commercial and non-commercial forest goods and services.**

Indicators

1. Sustainable forest plantation management policy.
2. Forest resources maps have been identified land use exploitation in each area.
- (S)3. Forest plantation management plan which identify of buffer zones and set-aside areas and that the zoning shall be identified at the preparatory stage of the plantation establishment including;
  - Exploitation types of wood, non-wood and services.
  - Commercial and non-commercial production of forest goods and services.

**4.4.4 Forest plantation management practices shall maintain and improve the forest resources and encourage a diversified output of goods and services over the long term.**

Indicators

1. The results of forest plantation implementation of forest resources management.
2. The results of marketing research and development of forest products and services in long terms.
3. Evidences of forest plantation resources improvement.

**4.4.5 Regeneration, tending and harvesting operations shall be carried out in time, and in a way that does not reduce the productive capacity of the site, for example by avoiding damage to retained stands and trees as well as to the forest soil, and by using appropriate systems.**

Indicators

1. Evidences of productive impact assessment from plantation forest activities, including regeneration, tending and harvesting operations.
2. Evidences of implementations following to implemented procedures for preventing damages to retained stands, trees and soils.

**4.4.6 Harvesting levels of both wood and non-wood forest products shall not exceed a rate that can be sustained in the long term, and optimum use shall be made of the harvested forest products, with due regard to nutrient off-take.**

Indicators

1. Evidences of productive survey for wood and non-wood forest products together with sustainable economy concept of forest plantation in long term.

(S)2. Reducing nutrient off-take plan and implementation. (If any)

**4.4.7 The exploitation of non – timber forest products, including hunting and fishing, shall be regulated, monitored and controlled.**

Indicators

1. Evidences of non-timber forest products inventory from forest plantation with identifying the exploitation of communal users such neighborhood villagers, labors or employees.

2. Evidences of operational implementation for timber and non-timber forest products from forest plantation.

**4.4.8 Adequate infrastructure such as, roads skid tracks or bridges shall be planned, established and maintained to ensure minimizing negative impacts on the environment.**

Indicators

1. Forest plantation management plan and budgets in order to plan, establish, maintain and improve the infrastructural system annually.

2. Map shall provide the road transportation of wood and goods.

3. Evidences of environmental impact analysis and evaluation in order to establish infrastructure.

(S)4. Infrastructure planning and development uses techniques to minimize impacts on the environment

**4.5 Maintenance, conservation and appropriate enhancement of biological diversity in forest ecosystems**

**4.5.1 Forest plantation management planning shall aim to maintain, conserve and enhance biodiversity on ecosystem, species and genetic levels as appropriate area.**

Indicators

(S)1. Reports of the biodiversity inventory, including to plants and animal species in forest plantation areas.

(S)2. Forest plantation management plan uses a precautionary approach which identifies buffer zones and set-aside areas and that the zoning shall be identified at the preparatory stage of the plantation establishment including provide maintaining, conserving and enhancing the levels of

ecosystem diversity, species and genetic compatible to the size and use of the forest plantation areas.

(S)3. Evidences of inventory, monitoring, evaluation of biodiversity change in appropriately periodically updated.

4. Evidences of public information channels for informing biodiversity summary to the communities such as public relations board, brochures or websites.

**4.5.2 Forest plantation management planning, inventory and mapping of forest resources shall identify, protect and/or conserve ecologically important forest plantation areas containing significant concentrations of:**

- a) protected, rare, sensitive or representative forest ecosystems;**
- b) areas containing endemic species and habitats of threatened species;**
- c) areas containing endangered and reserved species;**
- d) large landscape areas of national, regional and international importance.**

Indicators

1. Map of forest classification and resources shall provide protected forest, sensitive forest, endemic species, threatened species, endangered species and large landscape areas with the importance for global, regional and national levels.

2. Forest plantation management plan shall describe the protection, maintenance and conservation of forest ecosystems in specific of protected forest, sensitive forest, endemic species, threatened species, endangered species and large landscape areas in primary stage of the establishment of forest plantations and those areas are form a part of buffer zones and set-aside areas.

3. Evidences of forest plantation management plan, monitoring and evaluation.

4. Evidences of public information channels for informing implemented summary to the communities.

**4.5.3 Protected and endangered plant and animal species shall not be exploited for commercial purposes where relevant shall take measures to prevent to increase their population.**

Indicators

1. Policy or guidelines of forest plantation management describes the way how to protect endangered plant and animal species from hunting or exploiting with commercial purposes.

2. Forest plantation management plan shall provide the policy of protection and prohibition of endangered plant and animal species with commercial purposes.

3. Evidences of policy or implementation monitoring and evaluation.

**4.5.4 Forest plantation management shall ensure successful regeneration through natural regeneration and replanting at the same time.**

#### Indicators

1. Forest plantation management plan shall provide the annual rotation, regeneration or replanting.
2. Reports of annual harvesting.
3. Reports of regeneration time (including coppice) by regenerating or replanting methods to ensure the quantity and quality of the forest resources.

**4.5.5 For tree planting, origins of native species and local provenances that are well-adapted to site conditions shall be preferred, where appropriate. Only those introduced species, provenances or varieties shall be used whose impacts on the ecosystem and on the genetic integrity of native species and local provenances have been evaluated, and if negative impacts can be avoided or minimized.**

#### Indicators

1. Evidences of study and inventory to do the lists of trees and native tree species and local provenances. Moreover, lists of exotic species were planted in plantation.
2. Evidences of tree selection with appropriate to local conditions and promote to afforestation and reforestation activities for improving ecological connectivity.
3. Evidences of ecological impacts in case of planting exotic species in forest plantation.

**4.5.6 Genetically-modified trees shall not be used in forest plantation area. Until enough scientific data on genetically-modified trees indicates that no impacts on human, animal, vegetation and environment.**

#### Indicators

1. Evidence including data confirming no GMO is used in forest plantation area.

**4.5.7 Forest plantation management practices shall, where appropriate, promote a diversity of both horizontal and vertical structures such as uneven-aged stands and the diversity of species such as mixed stands. Where appropriate, the practices shall also aim to maintain and restore landscape diversity.**

#### Indicators

1. In case of forest plantation;
  - 1.1 Surveying the evidences of life-being status, plant and animal species in forest plantation ecosystem.
  - 1.2 Plantation reports shall provide the tree species lists that planted
  - 1.3 Plantation reports shall demonstrate the aged class.
  - 1.4 Forest plantation management plan shall enhance to the forest plantation diversity of both horizontal and vertical structures.
  - 1.5 Guidelines of the forest plantation diversity of both horizontal and vertical structures.

1.6 Evidences of forest plantation management monitoring and evaluation with periodically updated.

(S)1.7 Silviculture should promote a diversity of age classes and species appropriate to the size and use of the forest.

2. In case of conservation;

2.1 Surveying the evidences of life-being status, plant and animal species in forest plantation ecosystem.

2.2 Forest plantation management plan shall enhance to the forest plantation diversity of both horizontal and vertical structures.

2.3 Guidelines of the forest plantation diversity of both horizontal and vertical structures.

2.4 Evidences of forest plantation management monitoring and evaluation with periodically updated.

**4.5.8 Traditional management systems that have created valuable ecosystems on appropriate sites shall be supported, when economically feasible such as coppicing on appropriate area.**

Indicators

1. Evidences of informative collection for traditional management related to forest plantation implementation. (If any)

2. Evidences of support and promotion for applying traditional and experienced management into forest plantation implementation. (If any)

**4.5.9 Tending and harvesting operations shall be conducted in a way that does not cause lasting damage to ecosystems. Wherever possible, practical measures shall be taken to improve or maintain biological diversity.**

Indicators

1. Evidences of tending and harvesting survey may effect to ecosystems.

2. Evidences of tending and harvesting evaluation and measures for protecting and preventing damages to the ecosystems.

3. Forest plantation management plan shall provide guidelines or measures of ecosystem conservation and enhancement.

4. Evidences of monitoring and evaluation for ecosystem conservation and enhancement measures from tending and harvesting activities a timely fashion.

**4.5.10 Infrastructure shall be planned and constructed in a way that minimizes damage to ecosystems, especially to rare, sensitive or representative ecosystems and genetic reserves, and that takes threatened or other key species – in particular their migration patterns – into consideration.**

#### Indicators

1. Evidences of infrastructural construction survey in relevance to ecosystem impacts.
2. Evidences of the infrastructural construction evaluation from surveying results with measures if that activities effect on ecosystems.
3. Forest plantation management plan for initiating guidelines or measures of the infrastructural construction implementation with less impact to the ecosystem conservation.
4. Evidences of monitoring and evaluation for ecosystem impacts from the infrastructural construction guidelines and measures with periodically updated.

**4.5.11 With due regard to management objectives, measures shall be taken to balance the pressure of animal populations and grazing on forest regeneration and growth as well as on biodiversity.**

#### Indicators

1. Map of forest resources shall provide the forest plantation and livestock areas.
2. Livestock inventory and information in forest plantation operations.
3. Balanced guidelines of animal populations and forest regeneration as well as biodiversity.
4. Forest plantation management plan shall provide livestock guidelines in forest plantation areas.
5. Evidences of monitoring and evaluation from livestock activities in forest plantation operations.

**4.5.12 Standing and fallen dead wood, hollow trees, old groves and special rare tree species shall be left in quantities and distribution necessary to safeguard biological diversity, taking into account the potential effect on the health and stability of forests and on surrounding ecosystems.**

#### Indicators

1. The inventory of evidences of standing and fallen dead wood, hollow trees, old groves and special rare tree species in quantities and distribution.
2. The evidences of assessment inventory and lists of fallen dead wood, hollow trees, old groves and special rare tree species in quantities and distribution.
3. Forest plantation management plan shall provide the performing guidelines or measures of protecting and conserving special rare tree species such as fallen dead wood, hollow trees and old groves.
4. Evidences of monitoring and evaluation for biological diversity of fallen dead wood, hollow trees, old groves and special rare tree species in quantities and distribution with periodically updated.

**4.6 Maintenance and appropriate enhancement of protective functions in forest management (notably soil and water)**

**4.6.1 Forest plantation management planning shall aim to maintain and enhance protective functions of forest plantation for society, such as protection of infrastructure, protection from soil erosion, protection of water resources and from adverse impacts of water such as floods or avalanches.**

Indicators

1. Evidences of survey and evaluation for risk areas of soil erosion and water contamination and pollution.
2. Evidences of implemented results, following to protective and solving - problematic measures and occurred from further impacts.
3. Monitoring plan of soil and water changing conditions in periodically.

**4.6.2 Forest plantation areas that fulfill specific and recognized protective functions for society shall be registered and mapped.**

Indicators

1. Map of forest resources shall provide social protection areas and including forest management planning.
2. Evidences of implemented results, following to protective and solving - problematic measures and occurred from further impacts.
3. Monitoring and evaluation plan of soil and water changing conditions in forest plantation areas.

**4.6.3 Special care shall be given to silvicultural operations on sensitive soils and erosion-prone areas and in areas where operations might lead to excessive erosion of soil into watercourse. Inappropriate techniques and use of unsuitable machinery shall be avoided in such areas.**

Indicators

1. Evidences of survey and classification of sensitive soils and erosion-prone areas.
2. Evidences or supported information by using silvicultural system appropriately.
3. Evidences of implementing guideline and machinery uses in sensitive soils and erosion-prone areas.

**4.6.4 Special care shall be given in forest areas with soil and water protection functions. Inappropriate use of chemicals and silvicultural practices influencing water and soil quality in a harmful way shall be avoided.**

Indicators

1. Records of chemical uses or other harmful substances or chemical used instruction manual of forest plantation activities.
2. Forest plantation management plan in terms of soil and water conservation and protection

such as planting mulching plants (Vetiver grass or Beans) or check dam.

**4.6.5 Construction of roads, bridges and other infrastructure shall carried out in a manner that minimizes bare soil exposure, avoids the introduction of soil into watercourses and preserves the natural level and function of water courses and river beds. Proper road drainage facilities shall be installed and maintained.**

Indicators

1. Forest plantation management plan shall provide the infrastructural construction plan such as roads, bridges, and others.
2. Evidences of impact assessment for soil and water.
3. Measures of impact minimization from infrastructural construction activities such as soil exposures, water contaminations and natural drainage.
4. Evidences of natural resources impact evaluation and monitoring compared with before and after structural construction operated.

**4.7 Maintenance of other socio-economic functions and conditions.**

**4.7.1 Forest plantation management planning shall aim to focus on functions of forests to society, give due regard to the role of forestry in rural development, and especially give new opportunities for employment in connection with the socio – economic functions of forests.**

Indicators

1. Forest plantation policy shall provide the employment and communal capacity building.
2. List of employees, workers and contractors.
3. Evidences of communal stakeholder analysis and communal list of surrounding forest plantation areas.
4. Evidences of causes of non -hiring local employment.
5. Training records and results of employees, workers and contractors.
6. Evidences of communal capacity building or communal services.

**4.7.2 Forest management shall promote the long – term health and well – being of communities within or adjacent to the forest management area.**

Indicators

1. Evidences of impact assessment of forest plantation activities to communal health and well-being.
2. Guidelines of impact minimization for communal health and well-being from forest plantation activities.
3. Forest plantation management plan shall provide public participation process and communal communication channels.
4. Evidences of public participation meeting in terms of long-term health and well-being from

forest plantation activities.

**4.7.3 Property rights and land tenure arrangements shall be clearly defined, documented and established for forest plantation area. Likewise, legal, customary and traditional rights related to the forest plantation land shall be clarified, recognized and respected.**

Indicators

1. Land tenure or land use right including;

(1) the land having title deed or certificate of utilization under the Land Code (e.g.Nor Sor 4,3);

(2) the land having official written notice certifying that it is under the prescription eligible to apply for title deed or certificate of utilization under the Land Code since it has already been occupied and utilized under the law on agricultural land consolidation or the law on land consolidation for subsistence (Nor Kor 3, Kor Sor Nor5);

(3) the land within the land reform area under the law on agricultural land reform having evidence of permission, rent, hire purchase, transfer, or legacy (Sor Por Kor 4-01);

(4) the land having permission in writing under the law on national reserved forest allowing a person to utilize and reside, or to render forest or perennial plants plantation in the area of national reserved forest restoration, or to preserve forest, or render forest or perennial plants plantation in the degraded forest (Sor Tor Kor 1 Khor, Por Sor 31);

(5) the land having a license for forest plantation under the law on forestry;

(6) the land under operation of forest plantation by government agency, public enterprise, or other State agency.

(Reference from FOREST PLANTATION ACT (NO. 2), B.E. 2558 (2015))

2. Evidences of surveys for legal, cultural and traditional rights that involved to forest plantation areas including buffer zones and set-aside areas such as forest ordination ceremony or spiritual ceremony of forest goddess (If any).

**4.7.4 Forest plantation management activities shall comply with the law, cultural rights and customs. These rights must not be violated, without prior to notice and independent consent (FPIC) of the holders of right, including the provision of compensation where applicable.**

Indicators

1. Forest plantation management plan shall provide the lawful rights and cultural and traditional rights relevant to forest plantation areas and activities such as forest ordination ceremony or spiritual ceremony of forest goddess. (If any)

2. Evidences of communal acceptance or agreement such as compensation records for communities. (If any)

(S)3. No breaches of legal, cultural and customary rights and FPIC which are not under due

process for remediation should occur in the plantation area.

**4.7.5 Adequate public access to forest plantation for the purpose of recreation shall be provided taking into account respect for ownership rights and the rights of others, the effects on forest resources and ecosystems, as well as compatibility with other functions of the forest.**

Indicators

1. The map of forest resources and recreational areas. (If any)
2. Evidences of recreational area evaluation and patterns of exploitation activities for the communities. (If any)
3. Records of cooperative agreements for using recreational areas for communal recreation activities. (If any)
- (S)4. Forest plantation management plan to inform patterns of exploitation activities for communal recreation activities. (If any)

**4.7.6 Sites with recognized specific historical, cultural or spiritual significance and areas fundamental to meeting the basic needs of local communities (e.g. health, subsistence) shall be protected or managed in a way that takes due regard of the significance of the site.**

Indicators

1. Map of forest plantation resources shall provide specific historical, cultural or spiritual areas with communal morality and fundamental life-being such as archaeological site or antiquities. (If any)
2. Forest plantation management plan shall provide guidelines of operational implementations in specific historical, cultural or spiritual areas with communal morality and fundamental life-being. (If any)
3. Evidences of operational implementation of specific areas such as activity pictures or cultural and historical site legislation. (If any)

**4.7.7 Forest plantation management operations shall take into socio – economic functions. Especially the recreational function and aesthetic values of forests by maintaining for example varied forest structures.**

Indicators

1. Map of forest plantation resources shall provide recreational areas. (If any)
2. Evidences of recreational area evaluation and patterns of exploitation activities for the communities. (If any)
3. Records of cooperative agreements for using recreational areas for communal recreation activities in a way and to an extent that does not lead to serious negative effects on forest resources, and forest land. (If any)
- (S)4. Forest plantation management shall provide patterns of exploitation activities for communal recreation activities and aesthetic values of forests, by maintaining, for example, varied

forest structures. (If any)

**4.7.8 Forest plantation managers, contractors, employees and forest owners shall be provided with sufficient information and encouraged to keep up – to – date through continuous training in relation to sustainable forest management as a precondition for all management planning and practices described in this standard.**

Indicators

1. Training or lecturing plans to educate forest operators, contractors, employees and forest owners in each level during appropriate time.
2. Evidences of training or lecturing records in important topics, following to training plans.

**4.7.9 Forest plantation management practices shall make the best use of local forest-related experience and knowledge, such as those of local communities, forest owners, NGOs and local people.**

Indicators

1. Evidences of local wisdom gathering related to forest plantation operations. (If any)
2. The supporting evidences of local wisdom for applying to forest plantation management and operations. (If any)

**4.7.10 Forest plantation management shall provide for effective communication and consultation with local people and other stakeholders relating to sustainable forest management and shall provide appropriate mechanisms for resolving complaints and disputes relating to forest plantation management between forest operators and local people.**

Indicators

1. List of communities and stakeholders related to forest plantation areas.
2. Communication plans, channels and periodically updated for forest plantation management.
3. Evidences of communication results such as public relations board, records of communal meetings.
4. Complaint and dispute settlement mechanisms for solving problems and constrains for communities and stakeholders.
5. Evidences of Complaint and dispute settlement mechanisms and communal suggestions involve the forest plantation management.

**4.7.11 Forest plantation work shall be planned, organized and performed in a manner that enables health and accident risks to be identified and all reasonable measures to be applied to protect workers from work – related risks. Workers shall be informed about the risks involved with their work and about preventive measures.**

Indicators

1. Forest plantation management policy shall provide occupational health, safety and environment for safely working places.
2. Evidences of risk assessment for occupational health and safety of forest plantation workers.
3. Training records of occupational health and safety for forest plantation workers.
4. Evidences of occupational health and safety communications for forest plantation workers.
5. Evidences of safety checklist for working materials and equipment on standard working and safety condition.
6. Plans and records of using materials and equipment training for standard working and safety condition.
7. Evidences of safety checklist for fire – fighting, personal protective and other safety equipment with compatible to forest plantation operations.
8. Plans and records of principle first aid training for forest plantation workers.
9. Evidences of safety checklist for principle first aid equipment for ready using in emergency conditions.
10. Evidences of accident reports together with route -caused analysis for corrective and preventive actions in the future. (If any)
11. Group assurance, compensation measures or treatment fees for injured workers appropriately and accordingly to Labor Acts. (If any)

**4.7.12 Working conditions shall be safe, and guidance and training in safe working practices shall be provided to all those assigned to a task in forest operations.**

Indicators

1. Occupational health and safety manuals for forest plantation workers.
2. Training plans of occupational health and safety for forest plantation workers.
3. Training records of occupational health and safety for forest plantation workers

**4.7.13 Forest plantation management shall be based inter – alia on the results of scientific research. Forest plantation management shall contribute to research activities and data collection needed for sustainable forest plantation management or support relevant research activities carried out by other organizations, as appropriate.**

Indicators

1. Evidences of scientific research for applying to sustainable forest plantation management.
  2. Guidelines of researched supports in terms of forest plantation management projects by researched organizations.
- (S)3. If requested the FMU allows scientific research to be undertaken in their plantations.