CRITERIA AND INDICATORS FOR SUSTAINABLE MANAGEMENT OF NATURAL TROPICAL FORESTS
PART A: PRODUCTION ASPECT

SUMMARY OF TRAINING MODULE

ITTO PROJECT PD 89/90 (F) PHASE III
HUMAN RESOURCES DEVELOPMENT

DEPARTEMEN KEHUTANAN
CENTER FOR FORESTRY EDUCATION AND TRAINING
MINISTRY OF FORESTRY, REPUBLIC OF INDONESIA
INTERNATIONAL TROPICAL TIMBER ORGANIZATION
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Criteria and Indicators for Sustainable Management of Natural Tropical Forests:
Part A: Production Aspect

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Produced through bilateral co-operation between:

Center for Forestry Education and Training
Ministry of Forestry, Republic of Indonesia
International Tropical Timber Organization (ITTO)

ITTO PROJECT PD 89/90 (F) HUMAN RESOURCES DEVELOPMENT
Training Module
Criteria and Indicators for Sustainable Management of Natural Tropical Forests
Part A: Production Aspect

Summary

This document is the summarized version of Training Module: Criteria and Indicators for Sustainable Management of Natural Tropical Forests, Part A: Production Aspect. The original version is published in Indonesian as one of the results of the cooperation between the Center for Forestry Education and Training (CFET), Ministry of Forestry, Republic of Indonesia and the International Tropical Timber Organization (ITTO) through ITTO Project PD 89/90 (F).

The first chapter introduces the background, objectives, target groups, methods teaching equipments and materials, and curriculum.

The objectives of this training are to enable the participants to: (1) develop their attitude as forest officers that have special duty as facilitator, regulator and supervisor for the implementation of sustainable management of natural tropical forests, (2) define general principle of data collection, processing and analyzing to measure and describe indicators both at the national and management unit level at regular intervals, (3) identify source of data and information for sustainable forest management, especially for secondary data, and (4) validate the quality of data and information from various forest management units.

The target groups of this training are Regional Forestry Officers both Provincial and District levels dealing with the production aspect.
Chapter two explains theoretical subjects delivered in the training course:

(1) Introduction to the Course/Climate Setting.
(2) Introduction to ITTO Criteria and Indicators.
(3) Criterion 1: Enabling Conditions for Sustainable Forest Management.
(6) Criterion 4: Flow of Forest Produce.
(7) Criterion 7: Economic Aspect.
(8) Certification of Environmental Management.
(9) Environmental Impact of Deforestation.

Chapter three covers the following subjects related to exercise or fieldwork activities:

(1) Identification the Status of Natural Production Forest Management on Forest Management Unit Level.
(2) Seminar.

This module needs to be further elaborated and modified to meet recent development or local specific environment.
PART A.
PRODUCTION ASPECT

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CHAPTER I. INTRODUCTION

1.1. Background

It is widely accepted that forest resources should be managed to meet the economic, ecological and cultural needs of present and future generations. Therefore forest management must respond to environmental, social and economic issues. This requires feedback of relevant information between planning, implementation, control and impacts of forest management.

The concept of Criteria and Indicators (C&I), which was designed to be used in assessing the sustainability of forest management, has been evolving since 1995, when the issue gained recognition by the Intergovernmental Panels on Forests (IPF). Several international institutions have developed guidelines and C&I for sustainable management of forests. For example, International Tropical Timber Organization (ITTO) launched criteria for assessment of sustainable tropical forest management/SFM (ITTO, 1993); WWF and IUCN developed guidelines for timber plantations, environmental, social and cultural issues relating to commercial afforestation (WWF and IUCN, 1997); Forest Stewardship Council (FSC) introduced general principles and criteria for forest management (FSC, 1999); SmartWood Program of Rainforest Alliance released generic guidelines for SFM assessment (SmartWood, 1998); and Lembaga Ekolabel Indonesia (LEI, 1999) also developed C&I for SFM of natural and plantation forests in Indonesia. CIFOR has developed a generic process for the development and evaluation of C&I for natural forest (Prabu et. al, 1999), plantation forest (Muhtaman et. al, 2000), community managed forests (de Oliveira et. al, 2000).

The objective of the indicators is to provide an improve tool for assessing changes and trends in forest conditions and management
systems. This may be accomplished by measuring or describing the indicators at regular intervals. For, when the successive values of any indicators are placed in a time sequence, they provide information on the direction of change, either towards or away from sustainable forest management. To get a full picture of the evolving condition of the forest, it is necessary to examine changes (and therefore the indicators) at both the national level and that of the forest management unit.

The training module on Criteria and Indicators for Sustainable Management of Natural Tropical Forests was developed on the basis of ITTO Policy Development Series No. 9 (Part A) and 10 (Part B), Manual for the Application of Criteria and Indicators for Sustainable Management of Natural Tropical Forests Part A (National Indicators) and Part B (Forest Management Unit Level). The manual was designed as a simple guide to enable forest department to measure and describe indicators at the national level (Part A) and assist forest managers to describe the indicators at the Forest Management Unit Level (Part B). The Manual (Part A and B) was developed by ITTO to facilitate use of the ITTO Criteria and Indicators for Sustainable Management of Natural Tropical Forests (1998). The manual provides a clear and detailed description of actions to be taken to measure and describe 66 indicators adopted in the ITTO Criteria and Indicators for Sustainable Management of Natural Tropical Forests.

To enhance both theory and practical skill of all related parties on the above mentioned ITTO manuals, Center for Forestry Education and Training (CFET) - Ministry of Forestry of the Republic of Indonesia

1 CFET has the duties to carry out education and training for forestry officials within the Indonesian Ministry of Forestry and other institutions related to forestry development. In implementing its duties CFET carries out the following functions: (1) To carry out the policies of the Ministry in education and training (2) To formulate the plan, programs, evaluation and reports (3) To study and develop education and training (4) To serve, supervise and coordinate educational and training activities (5) To manage the Center's administration.
in cooperation with ITTO [ITTO Project PD 89/90 (F)] have identified, developed and successfully tried-out\(^2\) of two training modules specially intended for public sector, the 66 indicators are divided into two separate training modules: (1) Production aspect (2) Environmental and Social aspect. All those training modules were written in Indonesian.

The process on developing training resources is composed of: (1) Workshop on Training Needs Assessment (2) Training Needs Identification (3) Training Design (4) Training Material development (5) Training Modules Development (6) Training Try-outs (See Figure 1.1). In order to reach the wider readers and to enable to support similar activities in South East Asia, both training modules were summarized in English.

This document is the summarized version of Production Aspect. On the original version of the module, each module is composed of four chapters; (1) Introduction (2) Guide for Module’s User (3) Curriculum and Syllabus (4) Training Manual. Chapter One to Chapter Three acts as introductory chapters, while the core of the module lies on Chapter Four. The latter chapter gives a comprehensive guidance to the trainers/tutors/facilitators on both Theory (class-room session) and Fieldwork (practical exercises). The level of guidance is given on a training subject basis, which are composed of Tutor Note (rough session scenario) and several handouts for participants. As such, tutors have to prepare Trainer’s Agenda/Session Planning by themselves.

It must be kept in mind that this module only contains minimum set of training material, thereby further elaboration, modification are required to meet recent development or local specific environment.

\(^2\) The main idea of training try-outs is to evaluate or test the initial draft of the newly developed module in the field. By testing the modules, it could be found several inconsistencies, irrelevant material, impractical exercises, insufficient time allocation etc. Those things will be bases to improve the modules.
1.2. Overall objectives of the training course

After completing the training course the participants are expected to:

1. Enable to develop their attitude as forest officers that have special duty as facilitator, regulator and supervisor for the implementation of sustainable management of natural tropical forests.

2. Enable to define general principle of data collection, processing and analyzing to measure and describe indicators both at the national and management unit level at regular intervals;

3. Enable to identify source of data and information for sustainable forest management, especially for secondary data;

4. Enable to validate the quality of data and information from various forest management units;

1.3. Target groups

Regional Forestry Officers both Provincial and District levels dealing with the production aspect.

1.4. Methods

It is realized that so far the definition of modules still varies among institutions. What is meant by 'module' in this document is a principal guidance for the trainers completed by minimum sets of training material (hand-outs) for participants. The existence of module is expected to enable to guide trainers and training organizers to reach the main objectives of the course.

The training module is not designed like a medicine or a cookbook; it is open for creativity of trainers/facilitators/training organizers. As such, further elaboration, modification or adaptation is required to
meet recent development, level of participants (experience, education) or local specific environments.

Training implementation, as much as possible, built upon the experiences of the participants. Training session give facilitation of the learning and sharing from participant to participant (cross-fertilization), rather than just one-way communication from facilitator to participants. Participants should be actively involved in all phases of the learning process through group activities (discussion, self-learning, group work, presentation, seminar, exercise, etc.). In this context, role of training facilitators are central, they should have

![Flow Diagram the development of training material](image)

**Figure 1.1. Flow Diagram the development of training material**

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3 A good facilitator should: be patient, listen and do not dominate the discussion, be appreciative, always learn, be equal, do not "teach", be wise, do not judge, do not criticize, open, positive thinking.
Figure 1.2. Flow of Training Material Delivery on Production (Part A) and Ecology & Social Aspects (Part B).
Capabilities: (1) to give opportunity to participants to take part in all activities (2) to encourage the participants to be active, “force” them if needed (3) to improve the capability of the participants to be active through examples, stimulation, etc.

Considering the wide extent of sustainable management of natural tropical forests, large variation of course participants (in terms of their current duties and disciplines), the course is divided into two specialization: (1) \textit{Part A: Production Aspect} (2) \textit{Part B: Ecology and Social Aspects}. As both specialization have similar supporting materials, thereby those courses should be implemented on the same time and place (venue); some lectures could be attended by participants of both courses, and some of them are separated, fieldwork is suggested to be conducted on the same site (see Figure 1.2). Training try-out of this training module was conducted on Pekanbaru Forestry Education and Training (Balai Diklat Pekanbaru), while Fieldwork was conducted at \textit{PT. Diamond Raya Timber}\textsuperscript{4}, Riau, Sumatra.

\subsection*{1.5. Teaching equipment and material}
1. White board, OHP and slide, chart, poster, leaflet, board marker
2. Hand out, pen/pencil, notebook
3. Field work manual, compass, measuring tape, spade, pen/pencil, paper
4. Documents:
   a. Environmental Impact Analysis Study Report
   b. Forest Management Plan (Long-term, Five-year, and Annual)
   c. Various Management Unit Reports on:
      - Working Area (forest area) boundaries
      - Implementation of Indonesian Selective cutting.

\textsuperscript{4} PT. Diamond Raya Timber is the first certified sustainable management forest concessionaire in Indonesia (LEI-FSC Joint Certification Program).
- Environmental management
- Environmental Monitoring
- Measurement of Permanent Plot
- Social Forestry

### 1.6. Curriculum

<table>
<thead>
<tr>
<th>No.</th>
<th>Subject</th>
<th>Time (hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>A. Theory</strong></td>
<td>(40)</td>
</tr>
<tr>
<td>1.</td>
<td>Climate Setting</td>
<td>4</td>
</tr>
<tr>
<td>2.</td>
<td>Introduction to ITTO C&amp;I</td>
<td>4</td>
</tr>
<tr>
<td>3.</td>
<td>Criterion 1: Enabling Conditions for Sustainable Forest Management</td>
<td>4</td>
</tr>
<tr>
<td>5.</td>
<td>Criterion 3: Forest Ecosystem Health and Condition</td>
<td>4</td>
</tr>
<tr>
<td>6.</td>
<td>Criterion 4: Flow of Forest Produce</td>
<td>6</td>
</tr>
<tr>
<td>7.</td>
<td>Criterion 7: Economic Aspect</td>
<td>6</td>
</tr>
<tr>
<td>8.</td>
<td>Certification of Environmental Management</td>
<td>4</td>
</tr>
<tr>
<td>9.</td>
<td>Environmental Impact of Deforestation</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td><strong>B. Fieldwork</strong></td>
<td>(60)</td>
</tr>
<tr>
<td>1.</td>
<td>Identification the status of Natural Production Forest Management</td>
<td>50</td>
</tr>
<tr>
<td>2.</td>
<td>Seminar</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td>100</td>
</tr>
</tbody>
</table>
CHAPTER II. THEORY

2.1. Climate Setting

**Objective:** To create a favorable situation (climate setting) for the participants before starting with the core materials.

**Methods:**
- Introduction among the participants and the facilitator
- Group dynamic games

**Allocated Time:** 4 x 45 minute divided into two sessions
- Ice Breaking
- Introduction to the course

2.1.1. Ice Breaking
This session aims to set up a relaxing and helpful situation in knowing each others (among the course mate) by using games. There are a lot of games available especially used for this session.

2.1.2. Introduction to the Training Course
This session gives an overview on the background and objectives of the course, schedule and other related matters.

2.2. Introduction to ITTO C&I

**Objective:** To introduce participants to international and national initiatives on Sustainable Management of Natural Tropical Forests.

**Methods:** Lecture, discussion

**Allocated time:** 4 x 45 minute divided into five sessions
2.2.1. Global and national initiatives for sustainable management of natural tropical forests

This session aims to introduce participants to international and national initiatives for sustainable management of natural tropical forests.

The issues of subject delivery are:

1. Sustainable Development
2. Climate Change
3. Convention on Bio-diversity
4. Globalization and Free Trade
5. Certification of Forest Management
7. Intergovernmental Panel on Forest (IPF) and intergovernmental Forum on forest (IIF)
8. International Tropical Timber Agreement (ITTA) and ITTO Commitment Year 2000
9. Interdepartmental Committee on Forest (IDCF)
10. Communities Initiatives

2.2.2. Forest Stewardship and Management based on Act No. 41/ 1999

The purpose of this session is to discuss the importance of forest stewardship and forest management.
1. The essence of forest stewardship are:
   a. Forest planning
   b. Forest management
   c. Forest research, training, education, and extension.
   d. Control

2. The essence of forest management are:
   a. Forest Zoning
   b. Development of Management Plan
   c. Forest Utilization
   d. Forest rehabilitation and reclamation
   e. Forest protection and conservation

2.2.3. Principle definition, criteria, indicator and verifier for sustainable forest production management

The session is to discuss and define the principle definition of criteria, indicator and verifier.

2.2.4. Progress on Criteria and Indicators for SMNTF

Tutor explains the progress of Criteria and Indicators for sustainable management of natural tropical forests (SMNTF). The flow of progress is summarized on Table 2.1.
Table 2.1. Progress on C&I for SFM

<table>
<thead>
<tr>
<th>Year</th>
<th>Progress</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990</td>
<td>ITTO Year 200 Objective: ITTO's Council Session in Bali committed that all traded products of tropical forests by ITTO member countries should be based on sustainable forest management by the year of 2000.</td>
</tr>
<tr>
<td>1990</td>
<td>ITTO Guideline for Sustainable Management of natural Tropical Forests</td>
</tr>
<tr>
<td>1992</td>
<td>ITTO Criteria for the Measurement of Sustainable Tropical Forest Management</td>
</tr>
</tbody>
</table>
• Agenda 21  
• Forest Principle |
| 1993  | ITTO Guidelines for the Sustainable Management of Tropical Plantation Forests |
| 1993  | Ministerial Decree No. 576/Kpts-II/1993 on Criteria and Indicators for Sustainable Management of Natural Tropical Forests  
Ministerial Decree No. 610/Kpts-IV/1993 on Criteria and Indicators for Sustainable Management of Natural Tropical Forests on Management Unit Level  
| 1993  | Several international institutions have developed guidelines and C&I for sustainable management of forests.  
• Montreal Process  
• Helsinki Process  
• Tarapoto Process  
• African Timber Organization |
| 1993  | The development of international certifier bodies  
• Forest Stewardship Council (FSC)  
• Pan European Forest Certification Council (PEFCC) |
| 1994  | National initiative for Indonesian certifier body:  
Lembaga Ekolabel Indonesia |
| 1995  | CIFOR started developing a generic process for the development and evaluation of C&I for natural forest |
| 1998  | ITTO Criteria and Indicators for Sustainable Management of Natural Tropical Forests |
2.2.5. Overview on ITTO Criteria and Indicators

The purpose of this session is to discuss and introduce the ITTO guideline concerning to the concept of criteria and indicators for sustainable forest production management.

The topics of subject delivery by summarizing the ITTO criteria such as:

1. Enabling Conditions for Sustainable Forest Management (Criterion 1)
2. Forest Resource Security (Criterion 2)
3. Forest Ecosystem Health and Conditions (Criterion 3)
4. Flow of Forest Products (Criterion 4)
5. Biological Diversity (Criterion 5)
6. Soil and water (Criterion 6)
7. Economic, social and culture aspects (Criterion 7)
The steps of subject delivery are as follow:

1. Facilitators start the session by distributing handouts. Use a whiteboard or a chart or poster or cartoon showing the situation of global and national activities on sustainable forest management.
2. Discuss the subject with the participants.
3. Review the discussion by delivering in-depth explanation

### 2.3. Criterion 1: Enabling Conditions for Sustainable Forest Management

<table>
<thead>
<tr>
<th><strong>Objective:</strong></th>
<th>After attending the session participants will understand the prerequisite conditions should be fulfilled for sustainable management of natural tropical forests.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Methods:</strong></td>
<td>Lecture, discussion</td>
</tr>
<tr>
<td><strong>Allocated time:</strong></td>
<td>4 x 45 minutes</td>
</tr>
</tbody>
</table>

#### 2.3.1. Principle explanation and guideline for Criteria 1

1. **Indicator 1.1** explains the *Existence of a framework of laws, policies, and regulations to govern*:
   a. National objectives for forest including production, conservation and protection,
   b. The establishment and security of permanent forest estate,
   c. Land tenure and property rights relating to forests,
   d. The control of forest management,
   e. The control of forest harvesting,
   f. The control of forest encroachment,
g. The health and safety of forest workers, and
h. The participation of local communities.

2. **Indicator 1.2** and **Indicator 1.3** explain that to encourage sustainable forest management, the management should have financial support (investment and reinvestment) including economic instruments and other incentives which come from:

a. Central and local government
b. International government donation
c. Domestics and foreign resources

*Figure 2.2. Hierarchy of Forestry Planning in Indonesia*
3. **Indicator 1.4** explains number and adequacy of institutions to support sustainable forest management.

4. **Indicator 1.5** explains number and adequacy of trained professional and technical personnel at all levels to perform and support management, implementation, research and extension.

5. **Indicator 1.6** explains the existence and application of appropriate technology to practice sustainable forest management and the efficient processing and utilize of forest produce.

6. **Indicator 1.7** explains the capacity and mechanism for planning forest management and for periodical monitoring, evaluation and feedback on progress.

7. **Indicator 1.8** explains degree of public participation in forest management, such as in planning, decision-making, data collection, monitoring and assessment.

8. **Indicator 1.9** explains adequacy and timeliness of information to increase public awareness about forest policies, legislation and sustainable forest management.

### 2.4. Criterion 2: Forest Resource Security

<table>
<thead>
<tr>
<th><strong>Objective:</strong></th>
<th>After the session participants will be aware on criterion related to forest resource security; and how to collect, compile and analysis the data at regular intervals.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Methods:</strong></td>
<td>Lecture, discussion</td>
</tr>
<tr>
<td><strong>Allocated time:</strong></td>
<td>4 x 45 minute divided into two sessions</td>
</tr>
</tbody>
</table>

**Scope of forest resource security criteria**

This session start with discussing about the importance of sustainable forest management especially to define the fixed forest area in
relation to other economics sectors.

2.4.1. Resource Base

1. Indicator 2.1.

Tutors explain that this indicator covers extent and percentage of forested area, and the tutor leads the participants to discuss about how to get and fulfill the data for measuring the indicator. An overall land-use plan is important to ensure sustainable forest management, especially of the permanent forest estate, in relation to the other sectors of the economy. In this context, the external boundaries of the permanent forest estate should be clearly demarcated and changes in their extent should be regularly monitored.

2. Indicator 2.2.

Tutors explain that this indicator covers type of forest, and the tutor leads the participants to discuss about how to get and fulfill the data for measuring the indicator. The main focuses in this indicator are:

a. Extent (area) and percentage of total area under each forest types.

b. Data available about extent, forest type, and their changes.

3. Indicator 2.3.

Tutors explain that this indicator covers external boundaries of the permanent forest estate demarcated or defined, and the tutor leads the participants to discuss about how to get and fulfill the data for measuring the indicator.

4. Indicator 2.4.

Tutors explain the need to identify those areas formally converted to permanent non-forest use, such as for agriculture, settlements
and infra-structural development etc. Tutor leads the participants to discuss about how to get and fulfill the data for measuring the indicator.

2.4.2. Protection Procedures

1. Indicator 2.5.

Tutors explain that this indicator covers controlling of forest occupation, fire, illegal herding, and illegal cutting, and the tutor leads the participants to discuss about how to get and fulfill the data for measuring the indicator.

2.5. Criterion 3: Forest Ecosystem Health and Conditions

| Objective: | After the session participants will be aware on criterion related to forest ecosystem health and conditions; and how to collect, compile and analysis the data at regular intervals. |
| Methods:   | - Lecture, discussion |
| Allocated time: | 4 x 45 minute divided into two sessions |

This session start with explanation about conditions and health of forest that can be influenced by human activities and other natural accident such as air pollution, fire, flood, insects and disease. The discussion uses handout (code A.5.1) title conditions and forest health.

2.5.1. Area of Forest Damaged by Human Activities and Degree of Damage

1. Indicator 3.1.

Tutors explain that this indicator covers the extent and nature of disturbances in permanent forest area caused by human activities (encroachment, mining, illegal exploitation, hunting, shifting agriculture, unplanned fire etc), and tutor leads participants to
discuss about how to get and fulfill the data for measuring the indicator. The main focus in this indicator is to measure the appropriate intensity of disturbance handling with factual disturbance in the fields.

2.5.2. Area and Degree of Forest Damaged by Natural Causes

1. Indicator 3.2.

Tutors explain that this indicator covers various degrees of damages of permanent forest area by nature causes, and tutor leads participants to discuss about how to get and fulfill the data for measuring the indicator. The main focus in this indicator is to identify kind and degree of forest disturbance.

2.5.3. Conservation and Protection Procedures

1. Indicator 3.3.

Tutors explain that this indicator covers conservation and protection procedure, and the tutor leads the participants to discuss about how to get and fulfill the data for measuring the indicator. The main focuses in this indicator are the existence and implementation of quarantine and phytosanitary procedures to prevent the introduction of pests and diseases.

2. Indicator 3.4.

Tutors explain that this indicator covers conservation and protection procedure, and the tutor leads the participants to discuss about how to get and fulfill the data for measuring the indicator. The main focuses in this indicator are the existence and implementation of procedure to prevent the introduction of potentially harmful exotic and animal species.
2.6. Flow of Forest Products (Criteria 4)

| Objective: | After the session participants will be aware on criterion related to flow of forest products; and how to collect, compile and analysis the data at regular intervals. |
| Methods: | - Lecture, discussion |
| Allocated time: | 6 x 45 minute divided into two sessions |

This session start with explanation that every forest product could be managed in sustainable manner, in conditions that they are managed profitably in economics and financial term, environmentally friendly, and acceptable by community.

2.6.1. Resource Assessment

1. Indicator 4.1.

Tutors explain that this indicator covers extent and percentage of forest for which inventory and survey procedures have been conducted by forest concessionaire or authorities, and the tutor leads the participants to discuss about how to get and fulfill the data for measuring and describing the indicator.

2. Indicator 4.2.

Tutors explain that this indicator covers assessment of level of production sustainability for every forest main product in Forest Management Unit, and the tutor leads the participants to discuss about how to get and fulfill the data for measuring the indicator. The main focuses in this indicator are:

a. Planning and application of silvicultural system that fit to the carrying capacity of land, forest, and ecosystem.

b. Estimation for actual forest increment in Forest Management Unit.
3. Indicator 4.3.

Tutors explain that this indicator covers procedure for recording and monitoring data and information about wood and non-wood forest product in every type of forest per annum, and the tutor leads the participants to discuss about how to get and fulfill the data for measuring the indicator.

2.6.2. Planning Procedures

1. Indicator 4.4.

Tutors explain that this indicator covers implementation of forest management plan and forest harvesting operational plan and the tutor leads the participants to discuss about how to get and fulfill the data for measuring the indicator.

2. Indicator 4.5.

Tutors explain that this indicator covers large of production forest including management plan and harvesting plan base on operational plan, and the tutor leads the participants to discuss about how to get and fulfill the data for measuring the indicator.

The main focuses in this indicator are:

a. Production forest covered by management plans,

b. Compartment harvested according to harvesting (operational) plans.

3. Indicator 4.6.

Tutors explain that this indicator covers long-term plan, strategy and production plan including forest plantation, and the tutor leads the participants to discuss about how to get and fulfill the data for measuring the indicator.

a. Strategy, production plan and sylviculture system adopted in Forest Management Unit
b. Projection of forest production including wood and non-wood in long-term period

4. Indicator 4.7.

Tutors explain that this indicator covers history of forest management and history recording affecting in developing forest management from time to time, and the tutor leads the participants to discuss about how to get and fulfill the data for measuring the indicator.

The main focuses in this indicator are:

a. Historical record on forest management
b. Historical record affecting in developing forest management

2.6.3. Management Guidelines

1. Indicator 4.8.

Tutors explain that this indicator covers the existence of forest management guide, and the tutor leads the participants to discuss about how to get and fulfill the data for measuring the indicator.

The main focuses in this indicator are:

a. The assessment of natural regeneration
b. Measures to supplement natural regeneration where necessary

2. Indicator 4.9.

Tutors explain that this indicator covers procedure of forest management monitoring, and the tutor leads the participants to discuss about how to get and fulfill the data for measuring the indicator. The main focuses in this indicator are:

a. Procedure for monitoring and review of monitoring guideline
b. Application of guideline in forest management practice.
3. Indicator 4.10.

Tutors explain that this indicator covers existence of forest friendly harvesting guideline and the tutor leads the participants to discuss about how to get and fulfill the data for measuring the indicator. The main focuses in this indicator are:

a. Existence of impact logging control guideline
b. Effectiveness of impact logging control guideline
c. Ratio of main road and branch road to the total management unit area
d. Ratio of road quality to the forest potential
e. Existence of infrastructure

2.6.4. Monitoring and Evaluation

1. Indicator 4.11

Tutors explain that this indicator covers comprehensive monitoring and evaluation toward forest management guideline and it’s implementation, and the tutor leads the participants to discuss about how to get and fulfill the data for measuring the indicator.

The main focuses in this indicator are:

a. Existence of comprehensive procedure for evaluation and implementation of forest management guideline
b. Effectiveness of implementation of all guideline

2. Indicator 4.12.

Tutors explain that this indicator covers percentage of harvested forest production area, and the tutor leads the participants to discuss about how to get and fulfill the data for measuring the indicator. The main focus in this indicator is percentage of
2.7. Criterion 7: Economic aspect

Objective: After the session participants will be aware on criterion related to economic aspect of production forests; and how to collect, compile and analysis the data at regular intervals.

Methods: - Lecture, discussion

Allocated time: 6 x 45 minute divided into two sessions

2.7.1. Indicators on economic criteria

Tutors explain the indicators that should be fulfilled by the Forest Management Unit such as:

1. Indicator 7.1.

Tutors explain that this indicator covers forestry contribution to the gross domestic product and value of trade forest product, and the tutor leads the participants to discuss about how to get and fulfill the data for measuring the indicator.

The main focus of this indicator is available data from national reports on values and percentage contribution of the forestry sector to the Gross Domestic Product for the previous five years to indicate trends on the importance of the sector in the national economy.

2. Indicator 7.2.

Tutors explain that this indicator covers volume and value of wood and non-wood forest product traded in the domestic and international markets. The tutor leads the participants to discuss about how to get and fulfill the data for measuring the indicator. The main focus in this indicator is on the average annual quantity
and/or value of wood and non-wood forest products trade.

3. Indicator 7.3.

Tutors explain that this indicator covers volume and value of wood and non-wood forest product for subsistence use. The tutor leads the participants to discuss on how to get and fulfill data for measuring the indicator.

The main focus in this indicator is available data about volume and value wood and non-wood forest production for subsistent uses including firewood.

4. Indicator 7.4.

Tutors explain that this indicator covers ratio of domestic log to the processing capacity of wood based industry. The tutor leads the participants to discuss about how to get and fulfill the data for measuring the indicator. The main focuses in this indicator are:

a. Data of domestic log production
b. Data on processing capacity of wood based industries.

5. Indicator 7.5.

Tutors explain that this indicator covers distribution of incentive and share of cost-benefit, and the tutor leads the participants to discuss about how to get and fulfill the data for measuring the indicator.


Tutors explain that this indicator dealing with the existence and implementation of procedures to ensure the health and safety of forest workers, and the tutor leads the participants to discuss about how to get and fulfill the data for measuring the indicator.
2.8. Certification on Environmental and Sustainable Forest Production Management

**Objective:** After the session participants will understand the principle of environmental management certification, and mechanism of LEI forest certification system.

**Methods:** - Lecture, discussion

**Allocated time:** 4 x 45 minute divided into three sessions

2.8.1. Environmental Management Certification (ISO 14001)

This session aims to set up a main idea of ISO 14001 in Indonesia. The useful information can be the following:

1. Development of Environment Management Certification System
   Environmental standard started from individual and group environmental movement. The movement then created Strategic Advisory Group on Environmental (SAGE) in 1991. The SAGE has born a technical committee (TC) to develop series of international environmental management. Finally, environmental management standard notified to ISO 14000 with consist of (1) Environmental Management System (EMS), (2) Environmental Auditing (EA), (3) Environmental Labeling (EL), (4) Environmental Performance Evaluation (EPE), (5) Life Cycle Assessment (LCA), and (6) Term and Definitions (TD).

2. Environment Management Certification ISO 14001

ISO 14001 or Environmental Management System is a standard of how environmental impact assessed and controlled. ISO 14001 follows a Deming Cycle (Plan, Do, Check, Act). If a company has ISO 14001 certificate means internationally that company has a capability to identify and control environmental impact on their activities.
3. Development of application ISO 14001 in Indonesia

In Indonesia ISO 14001 is quite late to anticipate event Indonesia has agree with world trade and also accepted with WTO agreement.

2.8.2. Environment Quality Certification (ISO 9002)

This session aims to set up a main idea of ISO 9002 in Indonesia. The useful information can be the following:

1. ISO 9000 covers quality management standard so that ISO 9000 called as Quality Management System.

2. ISO 9000 consist of: (1) ISO 9001 is a Model for quality insurance in design or development of production, installation, and services, (2) ISO 9002 is a Model for quality insurance in production and installation (use for no design business), (3) ISO 9004 is a guideline toward the conditions element of ISO.

3. Application of ISO 9002 consists of understanding of aim and objectives, conditions element of ISO, and procedures.

4. Development of application ISO 14001 in Indonesia

2.8.3. Mechanism of LEI forest certification system

This session aims to set up a main idea of LEI certification system. The content of discussion for this session are:

1. LEI Certification System, including:
   a. Procedure for LEI assessment
   b. Implementation of LEI certification done by indipendence bodies

2. Steps for LEI Certification
   a. Field Pre-assessment
b. Field assessment and community input
c. Performance evaluation and decision process for certification
d. Approval for certification

2.9. Environmental Impact of Deforestation

**Objective:** After the session participants will understand the environmental impacts of deforestation especially to soil and water in watershed boundary unit.

**Allocated time:** 8 x 45 minute divided to five sessions.

2.9.1. Principle of watershed management

Discussion held around:

1. Importance of real defined boundaries for natural resources management such as forest.

2. The benefits of watershed boundary as follows:

   a. Watershed as a hydrology unit is an ecosystem with clear natural boundaries so that all components in the ecosystem can be easily and clearly analyzed.

   b. Watershed approach will help monitoring and evaluating environmental impacts.

   c. Watershed is an ideal way to observe interaction on human impacts to the environment.

In this session, tutor also discuss the objectives of watershed management such as:

1. Maintaining hydrological condition.

2. Maintaining land productivity

3. Increasing community welfare in the watershed area
2.9.2. Principle of poly and monocyclic sylviculture
Discussion held around:
1. Indonesian Forest Cutting and Plantation System
2. Indonesian Clear Cutting with Natural Plantation System
3. Indonesian Clear Cutting with Manmade Plantation System

The weakness of Indonesian Forest Cutting and Planting System:
1. The system generally implemented throughout Indonesia, without considering the variation of forest ecosystem.
2. The system issued with several assumptions without depth forest investigation.
3. The system is usually not operated by the owner of concession holders but mostly sub-contracted to other forest actors with lack of government control.

2.9.3. Impact logging to stand damage
Discussion held around:
1. Currently list of forest damages caused by logging
2. Strategy to control stands damage

2.9.4. Logging impact on surface runoff and flood-peak
Discussion held around:
1. ‘Hortonian’ overland-flow and saturation overland-flow.
2. Difference runoff response, between forested and non-forested watersheds.
3. Rainfall characteristic in tropical region.
4. Most of flooding causes.
2.9.5. Logging impact on water yield, dry season flow, erosion, sedimentation and declining soil fertility

Discussion held around:

1. Logging impact on water yield
2. Logging impact on dry season flow
3. Logging impact on erosion and sedimentation
4. Logging impact on soil fertility
CHAPTER III. FIELDWORK

3.1. Identification status of Natural Production Forest Management

**Objective:** After the session participants will be experienced on how to collect data and analyze the status of natural forest management on forest concession holder on the basis of ITTO criteria and indicators for sustainable management of natural tropical forests.

**Allocated time:** 60 x 45 minute divided to three sessions.

3.1.1. Fieldwork Preparation

1. Divide participants into four groups
2. Procurement of secondary data:
   a. Environmental Impact Analysis document
   b. Forest Management Plans (long-term, five-year, and annual)
   c. Reports on:
      • Implementation on Indonesian Selective Cutting and Planting System
      • Environmental management
      • Environmental monitoring
      • Measurement of permanent plot
      • Forest communities development
3. Sorting data and information
4. Field observation check-list and time schedule
5. Procurement field equipment
   a. GPS
   b. Compass
   c. Clip-board
   d. Rain coat
   e. Millimeter paper block
   f. Plain paper
   g. Marker
   h. Calculator

3.1.2. Collecting data and information in the field
1. Field orientation and discussion with field manager on sampling design, sampling sites.
2. Collect data and information based on checklist and discusses with local forest actors when necessary.

3.1.3. Analysis data/information and report development
1. Data processing and analyzing;
2. If necessary, participants discuss with tutors for data and information clarification;
3. After completing written report, participants also develop materials for seminar such as executive summary and power point presentation.
3.2. Seminar

**Objective:** After the session participants will be experienced on how to present the results of data collection and analysis the status of natural forest management on forest concession holder on the basis of ITTO criteria and indicators for sustainable management of natural tropical forests.

**Allocated time:** 10 x 45 minute

1. Seminar attended by all participants, tutors, forestry officers, representatives of Forest Management Unit

2. Every group has to present their report within 20 minutes, continue with 40 minutes discussion.

3. After completing seminar session, each group has to revise their report on the basis of inputs obtained during discussion.

**References**


