Chapter III
PRESENT FOREST MANAGEMENT IN INDONESIA

I. Introduction: Before analysis the Present pattern of Indonesian effort for sustainable management of Tropical Forest there is a need to understand what Forest Management is and how management of Tropical Forest is different?

1.1. Forest Management

The term forest management is applied in situations where an integrated coordinated series of actions are taken directed towards the achievement of specified objectives. It is because of the many different situations where choices need to be made in manipulating forest resources to meet particular objective that the term has come to have different meanings to different people. In the broadest sense forest management is a process, which effectively integrates the biological, social and economic factors which influence the decisions leading towards the implementation of one or more specified objectives.

According to the Society of American Foresters (1985) define forest management as “the application of business methods and principles of technical forestry to the operation of a forest property”.¹

“Forest Management” is defined as “that branch of forestry whose function is the organization of a forest property for management and maintenance by ordering in time and place the various operations necessary for the “CONSERVATION, PROTECTION AND IMPROVEMENT of the forest on the one hand and the CONTROLLED EXPLOITATION of the Forest on the Other”. Thus runs the definition as per Glossary of Forestry Terms published by Forest Research Institute.²

According to FAO “Forest Management deals with the overall administrative, economic, legal, social, technical and scientific aspects related to natural and planted forests it implies – various degree of deliberate human intervention ranging from actions aimed at safeguarding and maintaining the forest ecosystem and its functions to favoring specific socially or economically valuable species or groups of species for the improved production of goods and services. Sustainable forest management will ensure that the values derived from the forest meet present day needs while at the same time ensuring their continued availability and contribution

Historically forest management has mostly considered biological issues with a strong focus upon silviculture for the production of wood. As the forestry profession has grown an understanding of terms “forest management” has broadened to span wider environment issues, such as, conservation of biological diversity, social and economic matters and more generally, the concept of sustainability.

The Forest Principles developed at the United nations Conference on Environment and Development (UNCED) held in Brazil in 1992, have defined forest management as a part of a statement of principles for a global consensus on the management conservation and sustainable development of all types of forest.

The UNCED definition of forest management is “Forest resources and forest lands should be sustainable managed to meet the social economic, cultural and spiritual human needs of present and future generation. These needs are for forest products and services such as wood and wood products water, food, fodder, medicine, fuel, shelter, employment recreation habitats for wildlife, landscape diversity, Carbon sinks and recreation and for other forest against harmful effects of pollution, including air borne pollution, fires, pests and diseases in order to maintain their full multiple values."

According to Roth (1925) the task of forest management is to build up, put in order, and keep in order a forest business. Davis (1966) has listed the following subjects with “which forest management is concerned, Business and Social Aspects

<table>
<thead>
<tr>
<th>Economics</th>
<th>Technological Aspects</th>
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<tr>
<td>Organization and administration</td>
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<td>Finance</td>
<td>Mensuration and Statistics</td>
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<td>Accounting</td>
<td>Logging and saw milling</td>
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<td>Statistics</td>
<td>Wood technology</td>
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<td>Marketing</td>
<td>Pathology</td>
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<td>Business Law</td>
<td>Entomology</td>
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<td>Labor Relation</td>
<td>Fire Control</td>
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<td>Real estate</td>
<td>Wild life and Recreation</td>
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<td>Social and Political Science</td>
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| Water Civil Engineering |

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According to A.B. RecknageL & John Bentley (Professor of Cornell University) Forest Management consists of four mains parts, each of which will be taken up separately.

a) Forest Mensuration

b) Forest Organization

c) Forest Finance

d) Forest Administration.

a. Forest Mensuration: deals with the determination of the volume of stands trees, logs and other timber products and with the study of growth and yield of trees and stands.

b. Forest Organisation: Concerns itself with the organization of a forest property for maintenance, ordering in time and place the most advantageous use of the property with the ultimate aim of securing a sustained yield.

c. Forest Finance: Relates to the forest as an investment.

d. Forest Administration: deals with the principles of business conduct and methods employed in the administration of forest properties.7

The Committee of the conference of forest school in 1912 (Standardization of Instruction in Forestry) recognized that "Forest Management in the broadest sense includes a group of subjects which deal with the qualitative and financial aspect of forestry and with business considerations. Forestry as a business must conform to the principles which make for success in any other business. This means securing the highest returns on the investment the most efficient organization and conduct of operations and the regulation of the forest output so as to secure a permanent steady income.

While the attainment these results is dependent on knowledge of practically all conditions which affect forests, from the academic point of view it is desirable to segregate two groups of subjects which deal to be sure, with methods and conditions on which management must be based, but may be treated separately, namely, the technical group including silviculture, lumbering, protection, crop production and harvest and the economic group including studies of forest influence statistics forests laws which determine guiding principles or objects to be attained by the management. Forest Management is to harmonize these abstract principles and technical methods with the financial conditions of the owner, map out the exact nature and extent of the operation which can be most effectively carried out organize the work, and

secures the quantitative and financial resulted desired for the tract-as a whole Forest Management.

1. Technological Branch/Forest Crop Production
   i) Silviculture
   ii) Utilization
   iii) Protection

2. Business Branch / Forest Economy.
   i) Forest Mensuration
   ii) Forest Organization
   iii) Forest Finance
   iv) Forest Administration.

1.2 Definition of Sustainable Tropical Forest Management

It is important to define the meaning of the term sustainable management of tropical forest. A study undertaken for the International Tropical Timber Organization led to a definition having these primary considerations.

i) Sustainable Forest Management should be practiced on an operational and not an experimental scale.

ii) It should embrace a balanced and comprehensive range of management activities that include working plans yield prediction and control and other technical requirements.

iii) It should include the wide political social and economic criteria without which sustainability is probably unattainable.8

ITTO (International Tropical Timber Organization) Forest Management Guidelines

Prior to UNCED in 1992, ITTO established a set of principles that comprise an international reference standard for the development of more specific national guidelines for sustainable management of natural forests.

The ITTO principles were published as the Guidelines for the Sustainable management of Natural Tropical Forests, ITTO Policy Development Series No.1.

In 1993 the ITTO principles were supplemented by guidelines for the establishment and management of planted forests in tropical regions and guidelines for the conservation of biological diversity in tropical production forests. The development, application and enforcement of national guidelines based on the ITTO reference standard are matters for national decision by individual countries.

Features of the ITTO guidelines concerning sustainable Forest Management at National and Forest levels are:

**NATIONAL LEVEL**

*Policy and Legislation*
- Forest Policy
- Permanent Forest Estate
- National Forest Service

*Forest Level*

*Planning*
- Static and Dynamic Inventory
- Choice of silviculture concept
- Annual Allowable cut
- Mapping
- Environmental impact assessment

*Harvesting*
- Pre-harvest prescriptions

*Extraction*
- Roads

*Protection*
- Control of access
- Use of chemicals

*Legal Arrangements*
- Concession Agreement
- Logging permits on private or Customary land

*Monitoring and Research*
- Yield Control and Silviculture

- National Forest Inventory
- Forest Ownership
- Setting of Management Objectives
- Yield Regulation
- Management Inventory
- Preparation
- Preparation of Working Plan
- Roads
- Post harvest stand management
- Fire Protection
- Salvage permits
- Environmental impact studies.
1.3 **UNCED and Sustainable Forest Management**

The need to reconcile the productive functions with the protective, environmental and social roles which all types of forests fulfill was firmly expressed at UNCED. A declaration of 27 guiding principles focusing on the rights and obligation of sovereign states with respect to environment and development was agreed to at UNCED.

It included the Forest Principles – a statement of principles for a global consensus on the management, conservation and Sustainable development of all types of forest and to provide for their multiple and complementary functions and uses. As one positive step aimed at developing the Forest Principles there has been broad international agreement to formulate scientifically Sound Criteria and indicators for the management, Conservation and development of all types of forest.

**Criteria and indicators** are tools which can be used to define, implement and monitor sustainable forest management in the broadest sense of the term, nationally and at the forest level.

**Criteria**: Define the essential factors of forest management against which forest sustainability may be assessed. Each criteria relates to a key management factor which may be described by one or more qualitative, quantitative or descriptive indicators.

**Indicators**: Through measurement and monitoring of selected indicators, the effect of forest management action, or inaction can be assessed and evaluated and action adjusted to ensure that forest management objectives are more likely to be achieved.⁹

**International Initiatives to define Forest Management criteria and Indicators.**

Since UNCED, criteria and indicators for sustainable forest management have been formulated within the framework of several international and national meetings.

Recently ITTO, through an expert panel established in 1997 by ITTC, has revised its criteria for sustainable tropical forest management in line with recent trends and international development in the field. ITTC finalized the draft document criteria and indicators for the measurement of sustainable management of natural tropical forest in Liberville, Gabon in May 1998.¹⁰

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⁹ Guidelines for Management of Tropical Forest, (FAO, Rome, 1999), p. 16-18
¹⁰ State of Worlds Forest 1999, FAO (Rome, 1999)
In Sawn wood production Indonesia having fourth position in world after Brazil, Malaysia and India, but in Indonesia in various forest Industries sawn wood contributed 21% sectoral added value (Table 5).

### Table No. 5

**EKSPOR KAYU GERGAJIAN MENURUT NEGARA TUJUAN LIMA TAHUN TERAKHIR**

Sawntimber Export by destination during Last Five Years

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<td></td>
<td>Volume (M³)</td>
<td>Devisa (USS)</td>
<td>Volume (M³)</td>
<td>Devisa (USS)</td>
<td>Volume (M³)</td>
</tr>
<tr>
<td>1</td>
<td>Japan</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>2</td>
<td>Hongkong</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>3</td>
<td>Korea</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>4</td>
<td>Taiwan</td>
<td>274</td>
<td>233,108</td>
<td>263</td>
<td>257,289</td>
<td>-</td>
</tr>
<tr>
<td>5</td>
<td>Singapore</td>
<td>21</td>
<td>16,812</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>6</td>
<td>China</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>7</td>
<td>Other Asian Countries</td>
<td>864</td>
<td>64,171</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<tr>
<td>8</td>
<td>United Kingdom</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<tr>
<td>9</td>
<td>Belgium</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<td>-</td>
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<tr>
<td>10</td>
<td>Italy</td>
<td>264</td>
<td>213,945</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<tr>
<td>11</td>
<td>Other European Countries</td>
<td>253</td>
<td>188,425</td>
<td>-</td>
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<td>-</td>
</tr>
<tr>
<td>12</td>
<td>USA &amp; Canada</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<tr>
<td>13</td>
<td>Australia</td>
<td>-</td>
<td>-</td>
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<tr>
<td></td>
<td><strong>JUMLAH/Total</strong></td>
<td>2,374</td>
<td>2,047,05</td>
<td>795</td>
<td>849,586</td>
<td>60</td>
</tr>
</tbody>
</table>

Sumber/Source: Direktorat Jenderal Pengusahaan Hutan Produksi
Directorate General of Production Forest Utilization,

**Volume Ekspor Kayu Gergajian Menurut Negara Tujuan Tahun 1998-99**

Sawntimber Volume of Export by Destination

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![Diagram showing volume of export by destination]
A number of initiatives are under way to identify indicators of the FMU (Forest Management Unit) level. The Center for International Forest Research (CIFOR) and International Union of Forestry Research Organization (IUFRO) are also try to identify the Indicators for Sustainable Management.

But there is no general framework for management of all tropical forests, the specific conditions existing in the individual tropical countries provide the basis upon which concrete national strategies for the preservation/conservation of tropical forests are built. Indonesia has some special features.

- the sizes of the resources, much of which is relatively being on islands and near rivers.
- Forest composition is relatively homogenous
- Indonesia's location, being close to Japan, is an advantage in marketing.
- There has been a successful outcome from the log export ban.
- Production is hugely dependent on Plywood.
- Indonesia possesses substantial oil reserves.
- The saw milling industry has an over capacity.

Bases of these features present Indonesian forest management Model Emerged. 11

II. Forest Management in Indonesia

Sustainable forest management in Indonesia dates back to the Dutch Colonial times. When in 1874 teak plantation was established in Java. Java, growing will has shown the sustainability of its management and this has been recognized with the grant of the environmentally - sound level in 1990 by the Forest Alliance under its smartwood certification programme the oldest and largest forest management certification programme.

The success of plantation forest in Java has been a good lesson for the Government in managing the forest of other islands. Significant development in forestry and forest industry in Indonesia were initiated in late 1960's. Indonesia then had emerged from a period of apolitical dispute, from the independence revolution in the 1940's until the fail coup'd etat trial by the Communist Party in mid 1960's. The overall systematic development initiated from the time, with the set up of the first five years development (Pelita I) from 1969-1974, under a long term development plan from 1969-1994.

11 This Management Model (given here) is based on these information sources, (a) 'Forest Management in Indonesia', Report of Ministry of Forestry, Jakarta 1997. (b) Information given by Dr. Elias (Faculty of Forestry, Institute Pertanian Bogor, Kampus IPB Darmaga, P. O. Box 168, Bogor - 16009) (c) Information given by Ms. Carol J. Pierce Colfer, Programme Leader, Local People Devolution and Adoptive Co-Management, CIFOR Bogor (d) Information given by Mr. Jonny Holbert, Forestry & Estate Crops Research and Development Agency - Staff, (Ministry of Forestry and Estate Crop, Jakarta)
II.1 Forest Administration

From 1964-1967 forestry in Indonesia was an independent ministry, which was later subordinated into the ministry of Agriculture until 1983. Since 1984 till date, forestry is again administrated by a separated ministry. At the central level the ministry of forestry is assisted by seven echelon, I officials, namely a Secretary General, an Inspector General Four Director Generals (DG) and a Head of Forestry Research and Development (R&D) Agency. Each of the echelon has echelon II officials i.e. Directors under the DG heads of Bureau under Secretary General Inspector under Inspector General and heads of R&D centers under the head of R&D Agency. There are two specific Echelon II positions one is the head of Education and Training for Forestry Staff and Human Resources and the other is head of Forestry Extension. These two officials are responsible directly to the Minister, but administratively under the secretary general.\textsuperscript{12} (See the organizational chart.49 a)

II.2 Forest Land Use

In 1967, the government of Indonesia adapted Basic Forestry Law number 5, which set in place a method on forest management according to the forest’s function. This law was then followed by government Regulation No. 33/1970 on Forest Planning. This regulation among others requires the Ministry to reserve sufficient land as forest areas. These tracts are then classified, based on their function into protection forest productions forest, nature resources and recreation forest, conversion forest. This requirement is in accordance with the International Tropical Timber organization’s (ITTO) guidelines for sustainable development which require forest management authorities to establish permanent forest with definite boundaries.

To provide a basis for implementing sound forest management, and to avoid misuse of forest lands, the national forest land use plan (TGHK) was established and completed in the early 1980’s. The forest land was categorized according to the functions as stipulated in the Basic Forestry Law 1967. Forest boundaries establishment is being carried out continuously in the field under the National Forest Inventory Programme up to 1994, the Synchronization of the TGHK with RTRWP had been discussed for 13 provinces at the national level and for 10 provinces at the regional level. The urgency of those activities owes to the reality that several RTRWPs have not accommodated at all forestry spatial interest, besides having same essential problems, i.e.;

- Increase of protected areas at the same with decrease of cultivated forest areas due to convention into protected areas or non-forest areas.

\textsuperscript{12} Ibid
The changes of forest state boundary in the provincial special plan due to the changes of delineation of protected land and cultivated land require government budget.

Tendencies of utilizing the forested areas of conversion forest for non-forest land use without clear land use plan. Also speculative activities in land utilization which lead to forest degradation.

Overlapping use between forest land and non-forest land as well as between protected areas and valuable mining areas.

The synchronization, between the RPPH (TGHR) and RTWRP the regional of spatial plains essential to be implemented seriously and appropriately since the forest land use plan should be an integrated part of provincial/district special plans. In these junctions, the regional spatial plan has to be dynamic, accommodative and harmonious to prevent overlapping of land uses and speculations well as inefficiency in land utilization. The policies of the ministry of Forestry in special planning are inter-sectoral co-ordinations, synchronization with regional development, consideration of the time dimensions, consideration of land capability and land suitability assessment, Safety of current forestry investment/infrastructure and stability of industrial raw material supply.

Based on this regulation, Consensus Forest Land use Plan (1980s), the forest area are divided according to their functions into:

- **Production Forest**: is the forest designated for production of timber, rattan, saps, and other forest products. The production forest covers about 44 percent of the total forest area.

- **Protection Forest**: is the forest area which has specific physical characteristics that should be protected so that its functions, particularly hydrological functions, can be maintained. Protection forest covers a total area of about 30.3 million hectares or approximately 27 percent of the total forest area.

- **Nature Reserve and Recreation Forest**: Cover a total area of 19 million hectares or 13 percent of the Indonesian forest area. These areas are for the protection and preservation of genetic resources. Life supporting system and for the development of science, education and tourism.

- **Conversion Forest**: is the forest area which can be converted into other land uses such as for agriculture and settlement. This forest area cover a total area of 30 million hectares or around 20% of the total forest area in Indonesia.\(^{13}\)

\(^{13}\) The Indonesian Tropical Rain Forest Conservation Areas By: Ministry of Forestry Indonesia, Jakarta, March 1990, WWF India-DC
Based on its long term objectives, forest development in Indonesia has been focused on the following three activities respectively Conservation, Rehabilitation, Utilization. This is expected to bring Indonesian forestry to a sustainable forestry development in accordance with the ITTO targets of Sustainable Forest Management.

II. 2.1. Conservation

Nature conservation policies in Indonesia are based on the desire to promote the cultural and economic development of Indonesian people in harmony with their natural environment. To these ends, all forms of natural life and all ecosystem types within Indonesia will be conserved for the benefit of present as well as future generations.

Indonesia is one of countries that has declared the World Conservation Strategy. In Indonesia, the declaration was held on the 6th of March 1980 by the Minister of Agriculture, Minister of Information, Minister of State for Research and Technology and Minister of State for Development supervision and the Conservation of Environment. It shows the strong political will of the Indonesian government on nature conservation efforts.

Based on the World Conservation strategy, the policy on nature conservation in Indonesia is directed to achieve the three main objectives of living resources conservation, namely:

- to maintain essential ecological process and life supporting system
- to preserve genetic diversity
- to ensure the sustainable utilization of species and ecosystems.

In the beginning of REPELITA V (the fifth Five-year Development Plan), this policy was broken down into 10 programs.

1. "In-Situ" conservation Program: includes the activities in identifying, assessing and proposing conservation area; maintaining the boundaries of conservation areas, managing wildlife habitat and population inside conservation area.

2. "EX-Situ" conservation programme: Consists of many activities such as wildlife breeding, establishment and development of Zoos, development of Elephant Training Centers, and establishment of arboreta.

3. Management of Protection Forest


5. Development of outdoor Recreation/Tourism.
6. Conservation Education and Extension

7. Environmental Impact Assessment/Monitoring

8. Forest Protection Programme includes preventive measures a wildlife disturbances forest the identification, and problem solution on the trade of wild flora and fauna.


10. Foreign cooperation

Many cooperative activities with foreign countries/agencies/organization have been initiated.14

Conservation Area

One of the main activities in” In-Situ” conservation program is the establishment and management of conservation areas. These conservation areas are very rich in living resources.

Conservation area in Indonesia has a quite long history. The existence of conservation area can be traced back to 1714 when an officer of the Dutch colonial government gave and piece of land of 6 hectares in Depak (Between Jakarta and Bogar) to his employees. This area could not be given or sold to other person or party nor could it be converted into agricultural land. The area was well protected for 200 years. In 1913 this forest area was officially declared by the colonial government as a nature reserve. Officially, however, the oldest nature reserve in Indonesia is Cibodas nature Reserve (240 hectares) which was established in 1889. After that, many nature reserves were established by the Dutch government, especially after the enactment of the “Natuurmanumenten Ordonantie 1916” (Nature Reserve Act 1916 in 1932 the colonial government passed the “Natuurmanumenten en wildreservaten Ordonantie 1932” (Nature Reserve and Wildlife Reserve Acts 1932).

After the enactment of these acts, more and more nature reserves were established, wildlife reserve also started to exit in Indonesia. When Indonesian proclaimed their independence in 1945, there were 99 nature reserves covering total area of 314,976.821 hectares and 14 wildlife reserves covering a total area of 1.969.583 hectares.

In 1967 the Government of Indonesia passed the Basic Forestry Law No. 5 of 1967. This act also contains regulations on nature reserve and recreation forest.15

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14 The Indonesian Tropical Rain Forest Conservation Areas , Ministry of Forestry Indonesia, WWF India(Jakarta , March, 1990), p. 7-9

15 Ibid
II.2.2 Reforestation and Land Rehabilitation: Reforestation and land rehabilitation activities have been carried out since 1962 and since 1976 they became part of the presidential programme on Forest, Soil and water preservation. It is estimated that critical lands in Indonesia cover a total area of 10.9 million hectares located inside and outside the existing watersheds. There are 39 critical watersheds of which 22 are super critical.

Reforestation and re-greening involve replacing of degraded forest area especially insides protection forests as well as planting of trees on critical lands outside the forest area, social forestry, soil conservation (check dam), extension, and people’s forest based development.

The Ministry of Forestry prepares the working plan, which is elaborated later into operational technical plan. Implementation is done by the community with the coordination of the Local Government. (table 8) So far regreening activities have been done for a total area of 5.75 million hectares.

While reforestation covers total area of 2.226 million hectares. Social forestry development have been carried out since 1984 involving apiculture (16,520 households) resulting in 9.146 tons of honey. This activity is supported by the establishment of the National Apiary Center at Parung Center Panjang, Bogor which provides information, education and training facilities, apiculture technique demonstration colony breeding equipments as well as processing unit and production quality control. Sericulture is developed in South Sulwesi, Bali, West Java and South Sumatera. During the last five years. The production is 720 ton Silk string. Another effort is the provision of credit for soil conservation activities. This is initiated in Java, and will be developed also in other islands.

A major reforestation measure has been taken since 1987 with the development of Industrial Plantation Forest (ITF). It is planned that by year 2000 a total of 6 million hectare have been established. So far up to 1996 the figure now called Industrial forest plantation Concession (HPHTI) is 5.311 million hectares including 2.848 million hectares HPHTI for pulp production; 1.7859 HPGTI for wood production and 0.678 million hectares HPHTI for transmigration purposes.

At the beginning the programme stress out the establishment of fast growing species, but slow growing species are also encouragement including meranti, Jelutung etc.\(^\text{16}\)

\(^{16}\) Report of Ministry of Forestry, Jakarta 1997, no. 11, p. 17-18
II.2.3. Forest Utilization

II. 2.3.1 Silviculture System

The Indonesian Tropical forest is spread over Sumatra, Kalimantan, Maluku, Sulawesi and Irian Jaya. These forest grow naturally consisting of a mixed-age forest and dominated by trees of the dipterocarps family. Elsewhere the forest in Java is mostly plantation and is dominated by trees of the teak species. Three silviculture systems are legally stipulated to be applied in the utilization, namely Indonesian selective cutting and Planting System (TPTI), clear cut with natural regeneration (THPA) and clear cut with artificial regeneration (THPB). The TPTI is applied in the natural forests in outer Regions, while the THPB is successfully applied in Java in the teak forest.

As well, as far forests with low productivity which are then converted into industrial forest plantation (HTI)

(a) The Selective cutting and Planting System (TPTI): the TPTI System consists of many cycles called Polly cycles with a harvest every 35 years. It suggests that only commercial trees with a diameter at breast high (dbh) of 50 cm or more can be harvested. This stipulation is based on the consideration that young and valuable trees with diameter between 20 and 49 cm. are expected to produce wood for the next rotation. The diameter growth of these young trees in natural forest is estimated to be 1 (one) cubic meter per year per hectare while increment in logged over natural forest is estimated 3 (three) cubic meter per year per hectare. Thus over the 35 year the trees will attain a diameter between 55-85 cm and will produce the same levels of yields as the initial harvest. Silviculture treatment after logging is required in the case of natural regeneration is inadequate other management treatment such as post logging cleaning under brushing, liberation thinning are required to protect commercial trees from undesirable species competition. Additional funds are required to maintain roads buildings, and vehicles to facilitate forest stand supervision and protection from damage caused by fire or illegal felling. If the process of harvesting, regeneration and re-harvesting can be repeated indefinitely, the sustaining yield production is attained. 17

(b) Clear Cutting and Replanting System: Another silviculture system dealing with natural forest is the concept of “timber estate” or Industrial Plantation Forest. The plantation can be established with fast growing species by converting natural forest through clear cutting of tropical hardwood or by reforestation on land which has not been forested such as bare

17 Ibid, p. 19
land. Brush land, or along-along (Imperata Cylindrica) areas, such a plantation is managed and harvested for the production of industrial wood.

The same Silviculture System is applied in the production forests in Java which is solely managed by the State Enterprise Perum Peruhutani. The total forest area is about 2 million hectares. Which is dominated by teak plantations covering about 1 million hectares. Teak and same of the species planted are slow grower. It may take 60-80 years to wait until the teak plantation could be harvested.\textsuperscript{18}

Logging of the natural forests applying the TPTI will be done on sustainable basis with the annual log production of about 25 million cubic meters after the year 2000 the plantation forests (HTI) are expected to contribute higher volume of logs than the natural forests.

2.2.3.2. Forest Production

Forest Production at the implementation level is done by the concessionaires. Concession rights are given to state enterprises, private sector and cooperatives. There are six forest state enterprises. Perum Peruhutani is in charge of the management of forests in Java Covering 2,831,500 hectares, of which 2,063,100 hectares are production forests while 768,400 hectares are protection forests. The other five state enterprises are PT Inhutani I-V which are given concessions in other islands. The role of state-owned Forestry Enterprises is not merely carrying out economic function but also social function. There 575 private companies granted concessions totaling 61.7 million hectares. Concessionaires operation is under control and supervision by the ministry of Forestry. They have to submit for endorsement by the ministry the following three planning documents: Annual Working Plan, Five year Management Plan, and overall/Long term Management Plan. Control and Supervision are also done through: licensing of new concession; revoking, extension and transfer of concession license; transfer of working area; disciplinary sanctions; and improvement of professionalism of the human resources.\textsuperscript{19}

II.3. Development Programme

II.3.1. Social Forestry

In many parts of Indonesia forest communities enjoyed certain customary rights related to the adjacent forests. However, in the wake of functional classification and the development of forestry, their status has become ambiguous this situation, which has in various led to conflicts between forest enterprises and local communities urgently needs clarification. \textsuperscript{Tabel 11}

\textsuperscript{18} Ibid, p. 20
\textsuperscript{19} Report of Ministry of Forestry, Jakarta 1997, no. 11, p. 21
**Tabel/Table No.: 1**

### PENGEMBANGAN PENGELOLAAN HUTAN RAKYAT 5 TAHUN TERAKHIR

*Community Forest Management during Last Five Years*

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<tr>
<th>No</th>
<th>Tahun/Year</th>
<th>Latihan Petani Ht/Rakyat/Farmer Training Community</th>
<th>Temu Usaha/Meeting Operation</th>
<th>Pembuatan Areal/Model hutan Rakyat</th>
<th>Pembuatan Persemaian/Sampling Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Latihan (Orang)</td>
<td>Temu Usaha (Kali)</td>
<td>Pembuatan Areal (Juta btg)</td>
<td>Pembuatan Persemaian (juta btg)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rencana/Planned</td>
<td>Realisasi/Implemented</td>
<td>Rencana/Planned</td>
<td>Realisasi/Implemented</td>
</tr>
<tr>
<td>2</td>
<td>1995/1996</td>
<td>1.100</td>
<td>1.073</td>
<td>55</td>
<td>33</td>
</tr>
<tr>
<td>3</td>
<td>1996/1997</td>
<td>780</td>
<td>780</td>
<td>23</td>
<td>36</td>
</tr>
<tr>
<td>4</td>
<td>1997/1998</td>
<td>345</td>
<td>345</td>
<td>25</td>
<td>17</td>
</tr>
<tr>
<td>5</td>
<td>1998/1999</td>
<td>510</td>
<td>510</td>
<td>14</td>
<td>30</td>
</tr>
</tbody>
</table>

**Sumber/Source: Direktorat Jenderal Pengusahaan Hutan Produksi**

*Directorate General of Production Forest Utilization,*

**Keterangan/Note:** Pembuatan Areal Modell/ Sampling Unit pada Tahun 1994/95 1 unit = 20 Ha
Tahun 1994/95 s/d 1998/1999 1 unit = 25 Ha
The extent of legal rights and tenures on state forest land to be given to forest dwelling communities as well as supporting systems to be offered to such communities will depend on the land capability and the ability and willingness of the communities to become actively involved in the design of sustainable forest management system. This includes their involvement in forest resource base inventories and village land use classifications and their willingness to devise customary law based controlling mechanisms which secure the respective village land use classifications. Participatory investire and village land use classifications as well as Customary law based controlling mechanisms will be indispensable requirements for any formal agreements between forest dwelling communities and the MOF.

Whereas legal rights and tenures for forest dwelling communities on state forest land still need to be clarified, the rights of communities in forest areas out-ode state forest land are sufficiently clear. However the access of communities outside state forest land to supporting systems to be offered by the MOF within future social forestry programmes will also depend on their ability and willingness to manage the respective forest areas in a sustainable way. Thus participatory forest inventories and village land use classifications as well as customary law based controlling mechanisms will be indispensable for any support from the MOF also outside state forest land.

II. 3.2. Research and Development

Research and Development (R&D in Indonesia play important role in forest management forest product harvesting and industry. In an attempt to increase close cooperation and involvement between the researchers and the users a Research Advisory council assign to coordinator all identification and design of priority R&D objectives. Current R&D priorities which will be continued in the next future are:

a) timber stand improvement and silviculture techniques.

b) Timber harvesting and wood processing;

c) Wildlife management;

d) Planting and processing of non-timber forest production.

II. 3.3 Institutional and Human Resources Development: In order to be able to adopt the ever developing science and technology forestry institutional and human resources will be

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20 Report of Ministry of Forestry, Jakarta 1997, no. 11, p. 36
21 Ibid, p. 36
continuous developed accordingly. The objectives of the institution and human resources development are:

a) to improve and strengthen forestry institutional capacity, efficiency and facilities

b) to improve the capability and productivity of forestry human resources;

c) to improve forestry administration legislation and law enforcement.22

II.3.4 International Cooperation

International assistance and cooperation in Indonesia are mainly intended to promote access to science and technology, expertise and financial backing in support of national forestry development. International cooperation efforts are primarily focused on projects which have high multiplier effects and are intended to function as stimulator for more in-country driven forestry activities. International assistance is accepted under non conditional terms, for the mutual benefit of all parties involved. Most of the projects have educational/training components geared to strengthening human resource development.

In recent years the level of international cooperation has increased, both in the number of projects and donor make-up, most cooperation projects deal with reforestation, land rehabilitation and production forest management.

Total project outlays through 1997 amounted to over US$ 114 million in grants and US $ 227 million in loans23.

II.4 Problems and the Solution

II.4.1. Reforestation and Land Rehabilitation

Critical areas within the Watershed are subject to rehabilitation activities, including soil conservation measures and tree planting. The activity initiated in 1976, as part of the National Soil Conservation Programmes implemented by means of a Presidential Instruction, known as the Regreening and Reforestation Project (table no.9, 10). In this programme, upper watersheds have been used as the units for planting and monitoring soil conservation activities.

22 Ibid, p. 37
23 report of Ministry of Forestry, Jarakata 1997, no. 11, page 38
Tabel/Table No. : 9
REBOISASI INPRS, DANA DR, OECF 5 TAHUN TERAKHIR
Reforestation during Last Five Years

<table>
<thead>
<tr>
<th>No</th>
<th>Tahun Year</th>
<th>INPRES</th>
<th>DANA DR</th>
<th>OECF</th>
<th>JUMLAH Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Rencana Planned (Ha)</td>
<td>Realisasi Implement-ed (Ha)</td>
<td>Rencana Planned (Us)</td>
<td>Realisasi Implement-ed (Ha)</td>
</tr>
<tr>
<td>2</td>
<td>1995/1996</td>
<td>35.958</td>
<td>33.647</td>
<td>11.050</td>
<td>8.665</td>
</tr>
<tr>
<td>3</td>
<td>1996/1997</td>
<td>41.671</td>
<td>40.117</td>
<td>8.284</td>
<td>5.777</td>
</tr>
<tr>
<td>4</td>
<td>1997/1998</td>
<td>42.686</td>
<td>35.900</td>
<td>280</td>
<td>280</td>
</tr>
</tbody>
</table>

Sumber/Source: Direktorat Jenderal Rehabilitasi Lahan dan Pengusahaan Sosial
Directorate General of Land Rehabilitation and Social Forestry

Rencana dan Reboisasi Reboisasi
Planned and Implementation of Reforestation

![Diagram showing planned and implemented reforestation for 1994-95 to 1998-99]
The Soil Conservation Programme following an interdisciplinary and inter sectoral approach involves seven ministries, e.g. Forestry, Agriculture, Home Affairs, Public Works, Finance, National Development Planning and Population and Environment. In this Programme, Primary responsibility for planning and implementation give to the Ministry of Forestry. Under the MOF there are eleven Land Rehabilitation and Soil Conservation Centers (LRSCC) and 39 Land Rehabilitation and Soil conservation sub-Centers, to carryout the field level planning and extension activities of the programme. This is done in collaboration, with Provincial Development Planning Agency, BAPPEDAS. As already mentioned, the Presidential instruction (INPRES) of Regreening and Reforestation is one of the Project under the National Soil Conservation Programme. Regreening is a participatory tree Planting activity in areas outside forest Land, while forestation is carried out in degraded watersheds within forest area. Unlike reforestation activities regreening is not fully financed by the government and Costs are being met through an incentive system.
The plantation program in Indonesia includes three main types.

1. Plantation for industrial timber production;

2. Planting within forest area as a conservation measure known as reforestation or rehabilitation and

3. Planting with people’s participation to rehabilitate agricultural lands and watersheds outside forest areas known as regreening.

The industrial timber estate program provides employment for rural people, and decreases local people’s economic reliance on natural forests. This program can also be integrated with plans for buffer zones around conservation forest and transmigration programs. The industrial plantation programs in Repelita V were projected at 1.5 million hectares. The achievement during the first 4 years was till below expectations recorded at 730,599 hectares. This is mainly due to lack of incentives for private and to some extent lack of experience.

Regreening is a participatory tree-planting activity in area outside forest lands and is basically a social forestry program, in forest trees and other perennial crop plantations are encouraged. With increasing participation of local people, it is possible to select and plant species of trees useful to the community thereby reducing pressures on the forest. Unlike reforestation activities, the costs of regreening are not fully financed by the government, but are considered part of the farmers costs and are met through an incentive system. Reforestation is, on the other hand, carried out in degraded Watersheds within forest areas. The Indonesian government is also committed to further develop social forestry programs which are directed at increasing benefits for local people through cultivation of various minor products such as silk, honey bee, resin, rattan and ellipse nut in agro-forestry and forestry farming efforts.

The Indonesian government has embarked on a large scale reforestation effort under various programs, but the planning and implementation capabilities necessary for successful reforestation and maintenance hope to be amplified. The present rate of success in reformation and regressing is still low.

In many cases, the availability of suitable land has been a serious problem. At present the overall government master plan for reforestation includes an industrial forest scheme addressing site suitability, seed availability seeding production; Site preparation techniques and maintenance as well as end-use of the resulting crops.

The plantation programme followed in Indonesia are plantation with specific objective of timber production known as industrial plantation or industrial timber estates, planning for conservation purposes within the forest areas known as reforestation or rehabilitation and
planting with peoples participation known as agricultural lands and watershed outside forest areas. The last two at present do not have a production objective. Indonesia has ambitious plans for future plantation development. It has been the policy of the government to compensate for the timber removed from the natural forests through adequate amount of replanting, to be done by the concessionaires, since voluntary replanting did not take place, the government established a reforestation guarantee deposit fund or Dana Jaminan Reboisase (DJR) in 1980, requiring the concession holder to pay a fee/deposit to be used for forest regeneration, if the concession holder did reforest, he was refunded the deposit, based on costs incurred. The scheme failed to include establishment of plantation, due to various reasons, therefore, the government, embarked on the industrial Timber estate or HTI (Hutan Tanaman Industry) Development Programme in 1984/85, Productive natural forests is not intended to be converted for this purpose. Most of it is envisaged to be raised on secondary forest of law quality, belukar (Scrub Forest] and grass lands (alang-alang).24

II. 4.2 Shifting Cultivation

Historically shifting cultivation has been part of a process of clearing land for agricultural settlement. Where the native fertility of the soil has been high, or man/land ratio has become high due to population growth, shifting cultivation production techniques have given way to more intensive land use techniques. Thus on the islands of Java and Bali, which their large populations and rich volcanic soils, shifting cultivation can not longer be found. Similarly, in the deltas and fertile valleys of the others Indonesian islands shifting cultivation also is no longer evident. On the relatively infertile ultisol and oxisols soils of much of the outer islands of Indonesia, shifting cultivation continuous to an agricultural production techniques. Often not faced with either population pressure or any shortage of available land, the indigenous inhabitants of these localities have had no reason for changing their agricultural practices.

Several studies is indicate that shifting cultivation is practiced in Indonesia by 1.2 million family units or 6 million people (1985 data) over an area of between 9.3 and 11 million hectares. This constitutes about 8% of the total forest area, excluding Java and Bali, or 6% of total land area. The shifting cultivators comprise come 6 percent of the total farming population. The area of shifting cultivation percent a more complex picture when viewed at the provincial level.

Kalimantan and Sumatra account for more than three fourths of the shifting cultivation area in the country. Irian Jaya follows with another 11 percent. The remaining area is distributed among Nusa Tenggara, Timor, Maluku and Sulawesi.

The ministry of Forestry has three programmes which either directly or indirectly have an impact upon shifting cultivators. These three programmes are control of shifting cultivation (programme Pengendalian Perladangan), Village development programme (Program Bina Desa), and social forestry (Program perhutanan social).

As already noted the potential of the village development programme has not yet been realized. In 1988 it was decided to include the support of forest concession holders (HPH) in controlling shifting cultivation. The full name of this new programme is the timber concession holder village development programme (HPH Bina Desa). Coordination of the programme is to be carried out by a non-government agency known as the Indonesian Forest Community (Masyarakat Perhutananan Indonesia – MPI). The objective of this programme is the development of sedentary agricultural in villages already existing within timber concession area and the eventual recruitment of villagers workers of the time companies.

Under the Ministry of Agricultures these are two programme partly aimed at shifting cultivators: NES/PIR programme and the Rehabilitation and Expansion of export Crops. Shifting cultivators and local participants of the programme of resettlement are integrated rated into the overall transmigration programme through the “Allocation Scheme” for people living in transmigration area (APPDT). In conjunction with the activities of APPDT the ministry of transmigration project sites. This of course includes shifting cultivators as well as other forest residents.

In 1971, the ministry of social affairs. Started a programme which has been known as the Social Welfare Development for isolated Societies.

Under the Directorate of settlement and Village Infrastructure (Directorat Pemukiman dan prasarana Desa) of the Directorate General of Village Development (Dirktorat Jenderal pembangunan Desa) known by its acronym BANGDES the Ministry of Home Affairs (Dalam negeri) has had its own resettlement programme called the village Resettlement Project (Proyeh Pemukiman Kembali penduduk Desa). The main objective of this programme has been to develop villages which conform to the standard criteria set by the government. The target communities are those which are scattered and isolated.

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25 Report of Ministry of Forestry, Jakarta 1997, no. 11, p. 29-30
II.4.3 Forest Fire

In Java and Bali the incidence of forest fires is quite high. Many of the fires are accidental or it deliberately in fact such fires, though individually small, may prove to be very costly in economic terms.

It was previously thought that the incidence of fires would be low in the tropical wet forest for outer island. In fact the Kalimantan fires of 1982-1983 showed that the Southeast Asian rainforest can burn over considerably large area. As it is a likely considerably large areas. It is unlikely that this was a new occurrence. Also the precondition for the recent (September 1997 to June 1998) forest fires was a prolonged draught triggered by the El Nino. The humid-tropical nation has little experience of dry weather, and people adhere to deeply – ingrained fire-using habits. Fire has long been used as a cheap means for land clearance by farmers and by plantation and forestry – concession owners. Hundreds of hotspots flared up within a short period, with marked clustering in Kalimantan and Sumatra Some 1.5 million hectares have been burnt including valuable protected areas.

Even though the extent of these fires may have been greater but forest first occur on a small scale in various parts of Indonesia almost every year.26

Efforts to overcome forest fires include preventive and control measures. Guidelines circular and instructions have been issued by the MOF on fire protection. The co-operation of air transport services and specially equipped aircraft has been enlisted to monitor and control fires.

A National Forest Management Plan has been prepared by the MOF in co-operation with FAO, in addition to a project proposal on forest fire prevention to be pounded by donor countries. In every province the forest area will be divided into fire fighting controls units of 40,000- 50,000 hectares in Java and 100,00 – 150,000 hectares outside Java.

For every fire fighting control unit a fire fighting squad of 10 men is to be formed. For the total forest area of Indonesia this will call for 1,440 squads with a total of 14,400 fire fighters. The required equipment is substantial, as well as expensive. However, there will be a need to train staff in the use of fire protection and fire fighting equipment.

At the time of recent forest fire efforts at suppressing the fires were concentrated in the protected areas. Ground fire fighting was supplemented by water bombing and the use of fire retardants, and fire breaks were cut using bulldozers and tractors, with relief provided by the

military. Cloud seeding to generate artificial rain was carried out on a massive scale but to no avail. Even artificial cyclones were mooted as a means of dispersing the haze (The Star, 1997).27

Fire prevention measures included banning lighting, prosecuting culprit companies, suspending the issuing of land clearing licenses, rejecting annual plantation work plans, and imposing a moratorium on new investments in palm-oil plantation.28

Fire prevention campaigns were launched in villages,29 involving education and publicity programmes. National television and radio were used to broadcast information relating to fire detection and early warning systems, the causes of and damage resulting from fires, the organization of village fire fighting crews, fire management and fire suppression tools and approaches, and alternative farming techniques, overall, these measures have had limited effect; in the absence of a practical solution for what is a recurring problem30.

### III. Case Study of Java: Implementation of Forest Management.

The tropical forest of this country is about 144 million hectares, dominated by Dipterocarps species. In Java and Madura the forest is dominated by teak (Tectona grandis LINN) about one million hectares, which are mostly plantation forest. Together with other forest plantation, the forest in Java and Madura amount to about 3 million hectares.

At the implementation level forest management in Indonesia is done by concessionaires. Concession rights are given to state enterprises, private sectors and cooperative. There are six forest state enterprises. Perumerhutani is in charge of the management of forest in Java. The other five state enterprises are PT. Inhutani I-V which are given concessions in other islands.

In spite of population pressure on the existence of forest and the needs for land for development by other sectors in Java. The forest in Java is now known as the best example of forestry management system in the world, the success of plantation forest in Java has been a good learning for the government in managing the forest of other islands.

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27 "Artificial Cyclones ", The Star, 11 December (Kuala Lumpur, 1997)
28 "Indonesia to be Hit by another Dry Spell in 2000", The Straits Times, 26 November (Singapore, 1997)
29 "Current Fire Prevention Activities ", (IFFM, 9 April 1998), Website: smd.mega.net.it/ufin/haze.html
30 B B C News, "Haze-What can be done?", Website: news.bbc.co.uk:80/hi/26 February (1998)
There are also considerable backward and forward linkage for forestry and forest industries. The forest-product industries have many inter-industry transactions which raise the proportion of these intermediate inputs above the average for the economy.

In 1987, forestry and forest industries contributed approximately 1.2 percent to total employment.

In 1998 employment in forest concessionaires was 0.06% of total (Table 6).

**Table No. 6**

<table>
<thead>
<tr>
<th>No</th>
<th>Tahun/Year</th>
<th>Indonesia/Indonesian</th>
<th>Asing/Foreigner</th>
<th>Jumlah/Total</th>
<th>Asing/Jumlah Foreigner/Total (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1989</td>
<td>224,857</td>
<td>2,804</td>
<td>227,661</td>
<td>1.2</td>
</tr>
<tr>
<td>2</td>
<td>1990</td>
<td>79,847</td>
<td>583</td>
<td>80,430</td>
<td>0.7</td>
</tr>
<tr>
<td>3</td>
<td>1991</td>
<td>99,581</td>
<td>332</td>
<td>99,913</td>
<td>0.3</td>
</tr>
<tr>
<td>4</td>
<td>1992</td>
<td>101,538</td>
<td>289</td>
<td>101,827</td>
<td>0.3</td>
</tr>
<tr>
<td>5</td>
<td>1993</td>
<td>113,781</td>
<td>130</td>
<td>113,911</td>
<td>0.1</td>
</tr>
<tr>
<td>6</td>
<td>1994</td>
<td>125,560</td>
<td>86</td>
<td>125,646</td>
<td>0.1</td>
</tr>
<tr>
<td>7</td>
<td>1995</td>
<td>141,863</td>
<td>53</td>
<td>141,916</td>
<td>0.04</td>
</tr>
<tr>
<td>8</td>
<td>1996</td>
<td>147,537</td>
<td>53</td>
<td>147,590</td>
<td>0.04</td>
</tr>
<tr>
<td>9</td>
<td>1997</td>
<td>153,438</td>
<td>53</td>
<td>153,491</td>
<td>0.03</td>
</tr>
<tr>
<td>10</td>
<td>1998</td>
<td>55,820</td>
<td>33</td>
<td>55,853</td>
<td>0.06</td>
</tr>
</tbody>
</table>

**Sumber/Source:** Direktorat Jenderal Pengusahaan Hutan Produksi
Direktorat General of Production Forest Utilization

**Keterangan/Note:** *) Unit Logging dan Industrial
Logging and Industrial Units

**Tenaga Kerja Pada Hak Pengusahaan Hutan Employment in Forest Concessionaires**

![Graph showing employment trends](image-url)
III.1 Present Forest Management in Java

Java (Indonesia) provides a textbook example of the anomaly of traditional forest management in contemporary circumstances.

The State Forestry Corporation (SFC; Prum Perhutani in Indonesia) manages all production forest and most protection forest on Java.

Two-third of Java’s forest land is classified as production forest, composed of teak (Tectona grandis), pine (Pinus merkusii), dammar (Agathis sap.) and rasamala (Attringgia excelsia) plantations. The rest are protection forests and national park lands.

Structurally and ideologically, the contemporary SFC shares many similarities with its colonial predecessor.31

III.2 An Overview of PERUMPERUTANI

Perumperhutani32 was established by virtue of the Government Regulation no. 15 of 1972 which were later on enhanced by the Governmental Regulation no. 36 of 1986.

The Enterprises is administered under the Ministry of Forestry and Estate Crops and has the authority for planning, management exploitation and protection of forests in working territory.

III.2.1 Working Territory

The working territory of Perumperhutani Covers the entire state-owned forests in Java and Madura of about three million hectares within the provinces of west Java, Central Java and East Java excluding nature reserves, recreation forests and national parks, which are under the jurisdictions of the Directorate General of Forest Protection and Nature Conservation.

The territory is divided into units, each covering province, namely unit I Central Java, Unit II East Java and Unit III West Java.

III. 2.2 Field of Undertaking

Based on the economic and sustained yield principles as well as protection of state treasures, Perumperhutani will undertake the following efforts:

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32 Sources of Information (a) “A Glance at Perumperhutani”, booklet (1993-97) (b) Information given by Mr. Lukman, Research Assistant in Perumperhutani, Manggala Wanabakti building, Block VII.8-11th floor, JL Gator Surata, Senayan, Jakarta
It should be noted that forestry's employment is widely distributed and in certain places forestry and forest industry job from the core on which whole settlements are based. Additionally the statistics deal only with direct employment and ignore attributable employment in downstream industries such as furniture making, wood carving and others. The inputs out-put tables for the Indonesian economy suggest that for each job created in forestry. There will be 1.18 jobs elsewhere in the economy. The employment multiplier for Sawmilling and Plywood industry is 1.47 while for pulp and paper is 2.06. In terms of total employment impact including direct and attributable employment in the formal sector, forestry provides livelihood to around 4 million families.

The above statistics have not included other forest products. Such as rattan, pines, resin, which are also an important source of foreign exchange [Table 7,8]. Further more large numbers of forest dwellers and rural people earn a livelihood and cash income through products extracted from the forest.

<table>
<thead>
<tr>
<th>No</th>
<th>JENIS '88 Species</th>
<th>Satuan/Unit</th>
<th>94/95</th>
<th>95/96</th>
<th>96/97</th>
<th>97/98</th>
<th>98/99</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Rotan/Rattan</td>
<td>Ton</td>
<td>78.340</td>
<td>36.256</td>
<td>51.564</td>
<td>32.389</td>
<td>62.644</td>
</tr>
<tr>
<td>2</td>
<td>Gondorukem/Gum Resin</td>
<td>Ton</td>
<td>74.204</td>
<td>47.960</td>
<td>53.736</td>
<td>69.658</td>
<td>43.785</td>
</tr>
<tr>
<td>3</td>
<td>Turpentin / Turpentin</td>
<td>Ton</td>
<td>13.175</td>
<td>8.975</td>
<td>10.294</td>
<td>13.700</td>
<td>7.633</td>
</tr>
<tr>
<td>4</td>
<td>Minyak Kayu Puhi/Cayuput Oil</td>
<td>Litter</td>
<td>332.478</td>
<td>235.497</td>
<td>469.948</td>
<td>331.457</td>
<td>357.035</td>
</tr>
<tr>
<td>5</td>
<td>Damar/Dipterocarp Acacia Resin</td>
<td>Ton</td>
<td>0</td>
<td>3.869</td>
<td>1.556</td>
<td>6.423</td>
<td>7.887</td>
</tr>
<tr>
<td>6</td>
<td>Sagu/Sago</td>
<td>Ton</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>3.944</td>
<td>1.479</td>
</tr>
<tr>
<td>8</td>
<td>Kopal/Copal</td>
<td>Ton</td>
<td>2.057</td>
<td>816</td>
<td>821</td>
<td>764</td>
<td>516</td>
</tr>
</tbody>
</table>

Sumber/Source: Direktorat Jenderal Pengusahaan Hutan Produksi & Perum Perhutani
Directorate General of Production Forest Utilization, & Perum Perhutani

Non Wood Forest Product during 1998-99

THESIS
333.751509598
Ar677 Ma

TH10395
a) Forest utilization including plantation establishment, forest stand tending, harvesting and processing of forest products and marketing.

b) Supplementary business which support the achievements of the main business goal, approved by the Ministry of Forestry and Estate Crops.

III.2.3 Activities of Perumperhutani

III.2.3.1 Planning

Planning activities of Perumperhutani consists of forest area development, corporate planning and development planning. Forest area development is dealing with the surveying and mapping of the working territory, yield regulation, road network planning and preparation of sustained yield plan. Corporate planning includes potentials inventory and evaluation, SWOT analysis, goals projection, strategic settings and programs formulation to implement the strategies. Development planning is aimed at the short cut steps of measures to be taken in attaining certain goal(s) within a defined period of time.

III.2.3.2 Plantation Establishment

Forest plantation establishment by Perumperhutani consists of replantation of cut-over areas, non-productive and bare forest lands.

Teak plantation forest is still constituting the main resources of revenue of Perum Perhutani. Planting System applied are:

a) Taungya System in logged-over areas (clear cut), where local people are engaged as farmers with the right of growing staple food crop and other crops, and the obligation to grow forest trees.

b) Daily wage system, usually applied in corridor or spot planting. Labors are paid according to the daily wage tariffs. This system is used in areas where taungga system is impossible to be applied due to local of farmer candidate or due to the physical condition of the terrain.

ANNUAL PLANTATION AREA (1993-1997)

<table>
<thead>
<tr>
<th>AREA (HA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Species</td>
</tr>
<tr>
<td>-----------</td>
</tr>
<tr>
<td>1. Teak</td>
</tr>
<tr>
<td>2. Non teak</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>
### Table No. 8
**EKSPOR HASIL HUTAN NON KAYU 5 TAHUN TERAKHIR**
Exports of Non wood Forest Products during Last Five years

(Ton)

<table>
<thead>
<tr>
<th>No</th>
<th>Tahun / Year</th>
<th>Rotan/Rattan</th>
<th>Arang/Charcoal</th>
<th>Caslava/Cassia Vera</th>
<th>Kopal Agathis Resin</th>
<th>Damar/Dipter Resin</th>
<th>Tengkawang/Teng. Nut</th>
<th>Octah/Gutta Jehutang</th>
<th>Hasil Hutan Lainnya/Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1994-95</td>
<td>102,933</td>
<td>177,833</td>
<td>3.305</td>
<td>2.063</td>
<td>3.518</td>
<td>3.979</td>
<td>585</td>
<td>4,074</td>
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<tr>
<td>2</td>
<td>1995-96</td>
<td>101,540</td>
<td>66,335</td>
<td>1.292</td>
<td>1.168</td>
<td>14,494</td>
<td>10,468</td>
<td>301</td>
<td>5,131</td>
</tr>
<tr>
<td>3</td>
<td>1996-97</td>
<td>74,804</td>
<td>131,350</td>
<td>4.432</td>
<td>1.6</td>
<td>18,609</td>
<td>984</td>
<td>2,142</td>
<td>7,344</td>
</tr>
<tr>
<td>4</td>
<td>1997-98</td>
<td>102,577</td>
<td>103,612</td>
<td>20,202</td>
<td>-</td>
<td>-</td>
<td>213</td>
<td>2,785</td>
<td>19,681</td>
</tr>
<tr>
<td>5</td>
<td>1998-99</td>
<td>81,67</td>
<td>36,142</td>
<td>-</td>
<td>-</td>
<td>3,972</td>
<td>-</td>
<td>-</td>
<td>538,166</td>
</tr>
</tbody>
</table>

**Sumber/Source:**
Direktorat Jenderal Engusahaan Hutan Produksi
Directorate General of production Forest Utilization

**Ekspor Hasil Hutan Non Kayu**
Export of Non Wood Forest Products

In this way forestry sector play following role in Economic Development of Indonesia.

- Increase the National GDP.
- Increase of the state revenue of foreign exchange
- Expansion of job and business opportunities.
- Increase of the local people's income due to the creation of new agricultural and business opportunities.
- The establishment of communication facilities by the logging companies increases the economic mobility of the local population.
- Increase of skill of Indonesian personal.
III.2.3.4 Forest Stand Tending

The purpose of this activity is to establish high valued forest both in volume and quality by the end of the rotation age and to keep the soil fertility as well as to maintain the environment quality. Forest stand tending consists of weeding, pruning, thinning and protection against pest and disease and against other destruction like grazing the fire.

III. 2.3.5 Harvest

Harvesting of forests products which is dominated by logging operations is based on the labor intensive system, where local people are employed as many as possible within the constraints implied on the forest business. Forest products harvested are dominated by teak woods followed by pine wood. Other forest products are resin, Lac and Cayuput leaves. Girdling is still applied on teak trees, two years before the cut.

III. 2.3.6 Forest products Industry

Forest products industries conducted by Perum Perhutani are wood industries and non-wood industries.

a) Integrated Teak Wood Industry

This industry consists of sawmill, Veneer plant, dry kiln, moulding and Joinery plant and parquet plant. Three such industry are owned by Perumperhutani, namely in cepu, Brumbung and Gresik. The aim of this establishment is to create maximum value added, to minimized wastes and to open employment opportunity. Another purpose is to stimulate the development of the surroundings of the industries.

b) Sawmill

Up to now Perum Perhutani owns nine sawmills (PGM), i.e. in Unit I Central Java (3) and in Unit II East Java (6). The total capacity is 112,000 m³/year log intak, besides its own sawmills. Perum Perhutani employed 12 private sawmills with the capacity of 15,000 m³/rough sawn timber/finished product and 2500 m³/year log intake.

c) Pine Resin Processing Plant

To process rosin into resin and turpentine, Perum Perhutani owns 7 plants, namely in Unit I (4) and in Unit II (2), and in Unit III (1). The total processing capacity is 60,000 ton/year pine resin. In addition, Perum Perhutani employs seven private resin processing plants which total capacity of 40,800 ton of resin per year.

Ibid
d. **Cayuput Distillation**

To produce Cayuput oil from the leaves of Melaleuca leucadendron, Perum Perhutani owns 12 plants namely in Unit I(2), in unit II (4) and in Unit II (6).

e. **Shellac Processing Plant**

Perum Perhutani owns one shellac processing plant to process stock lack into seedlac and shellac. The output capacity is 300 tons/year of seed lac of shellac.

f. **Silk Reeling Plant**

Two silk yarn reeling plants are owned by Perumperhutani, namely in Unit I and Unit II with the total capacity 12 tons/year of year. Silk Worm eggs are produced by a center located in Unit I which capacity is 14,800 boxes/years of eggs.

Since 1986, Perum Perhutani has given the task to manage silk reeling plants in South Sulwesi with the installed capacity of 24,000 kg of yarn/unit years. To supply the need for silk worm Breeding Center with the production capacity of 35,000 boxes of eggs/year\(^{34}\).

### III. 2.3.7 Marketing of Forest Products

Wood and non-wood forest products marketing are aimed at the domestic and overseas marketing wood products consist mainly of teak wood (750,000 cum) and about 350,000 cum other species.

Non-wood forest products are rosin, copal, turpentine, cayupt oil, seedlack and shellac silk yarn and other.

System in domestic sale of the products are:

a) Big auction, to serve big timber companies

b) Small auction, to serve local people

c) Direct sale, to serve persons and home industries.

d) Contract based sale to serve certain agencies and Industries.

Export is conducted through the agency system in Europe, United States, Japan, Korea, Hong Kong, Singapore, India and Australia and Middle East Countries\(^{35}\).

### III. 2.3.8 Tree Improvement

\(^{34}\) Ibid

\(^{35}\) Ibid
PLATE 10. Palm oil plantation at Lampung, Southern Sumatra

PLATE 11. Pepper plantation primarily executed in Maluku and Sumatra
PLATE 12. 1997 Forest Fire, a View
Chapter III
Present Forest Management in Indonesia
PLATE 13. Center for International Forestry Research
To improve the potential of forest, tree improvement has been conducted since several years ago. The priority of tree improvement was set on teak.

The objectives of tree improvement are:

a) To produce high valued forest stands by using genetically superior seeds:

b) To identified the most suitable species in certain areas;

c) To improve genetically properties of trees regarding its growth, stem form, branching and the resistance against pest and disease.

d) To select exotic tree species for superior species.

Activities in tree improvement of teak in particular are:

a) Selection of plus trees which resulted 124 trees during the period 1982 – 1991, namely 78 trees in Central Java and 46 trees in East Java;

b) Designation of seed production areas of 4,360 hectares, of which 3,006 hectares in Central Java and 1,294 hectares in East Java. The Teak Center of Cepu (established in 1998) is the place for forest management development owned by Perum Perhutani located in Cepu, Central Java. The first priority is tree improvement aiming at the availability of superior seeds for the establishment of high valued forest stands36.

III.2.3.9 Rural Community Development

This effort started in 1973 with the aim toward protection of forest through prosperity approach. Later on in 1981 the strategy and purpose was changed into more conceptual and plan oriented aiming the development of rural social welfare. Since then more endeavors have been aimed at biophysical improvement of the villages, enhancement of skill of the people and opportunity granted to the local people to participate in forest development.

Recently, the social forestry effort has been introduced and the agro forestry system applied in the forest land where local people need land for their livelihood. It is hoped that this effort will create two main objectives, namely welfare to the people and well managed forests which in turn better quality of life37.

II. 2.3.10 Supplementary Activities

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36 Ibid
37 Ibid
PLATE : 14  Teak Forests

PLATE : 15  Kendal Forest District, Teak Plantation in Central Java
To enhance the multiple use of forest lands Perumperhutani undertakes supplementary activities. At present there are four such activities being carried out namely sericulture, beekeeping, recreation forest, wildlife breeding and support to home and Small scale industries.

These activities are aimed at the social welfare and profit earning and also purposed as the extension means for local people.

(a) **Sericulture**

The development of sericulture by Perumperhutani started in 1974, aiming at the provision of employment opportunities, in came resources for local people and supporting the national sericulture development.

**Present activities consist of;**

a) Management of sericulture, namely mulberry culture and raw silk reeling;

b) Center for Silk worm breeding in Magelang, Central Java. In 1986, Perumperhutani got responsibility from the Ministry of Forestry to manage a silkworm management unit in Sapping, South Sulwesi including the extension to local people.

(b) **Bee keeping**

Bee keeping of Apis mellifera by Perumperhutani started in 1972. Up to now there are about 2,200 local beekeepers in the villages around the forests in Central Java, East Java and West Java, having about 8,500 bee colonies. Since 1981, private companies undertook beekeeping business, which activities consist of:

(a) Breeding of imported Apis mellifera;

(b) Processing honey for local market.

c) In 1986 a center of national bee keeping in Parung panjang, Bogor, West Java was established, sponsored by FAO/UNDP. Three supporting sub-centers of bee-keeping are established in Sukabumi, West Java, in Pati, central Java and in Tretes, East Java.

(c) **Recreation Forest**

The utilization of the aesthetics of the forest are implemented through the establishment and management of natural recreation objects, called “Wana Wisata” which means recreation forest.

At present there are 120 locations of Wana Wisata, namely in Central Java and East Java there are 43 location each, and in west Java 34 location. Facilities are built according to the existing attraction locally, e.g. camping ground daily and over night recreations.
FOREST MAP OF PERUM PERHUTANI

LEGENDA:
- H. Lindung
- H. Payau
- Jali
- Mahoni
- Pinus
- Sono Keling

- Batas Propinsi
- Batas KPH
- Batas Pantai
Since 1989 recreation grounds for peculiar interest are established, namely teak forest in Cepu, mountain forest in Baturraden and mangrove forest in Cilacap.

(d) **Wildlife Breeding**

One of the business efforts conducted by Perum Perhutani is rearing of wildlife, among other timor deer (Cervus timorensis), total deer (Axis asix), bawean deer (Axis Kuhlii), mangrove crocodile (Crocodylus porurus) and long tail monkey (Mocaca fascularis). Deer rearing are located in Ranca Upas (Forest District South Bandung), Jonggal (Forest District Bogor) and Karankates (Forest District Blitar).

(e) **Crocodile Breeding (Crocodylus porusvs)**

Crocodile breeding started in 1989 located in Blanaktan, Sub Forest District Pamanukan, Forest District Purwakarta, West Java. This effort was aimed at Conservation and creating resources of income.

(e) **Crab Eating Monkey (Macaca fascicularis) Breeding**

Breeding of Crab Eating Monkey began in 1987 in Tinjil Island and in 1991 in Deli Island; both are located in Banten, West Java. This business is undertaken in cooperation with the Ministry of Population and Environmental Affair, Bogor Institute of Agriculture, Americas Consortium of Primates and Primate Indonesia Ltd.

The aim was conservation and to meet the need of domestic and foreign biomedical researches. Youngsters for breeding are caught from forests in Jambi and Lampung, Sumatera which are free from disease like SRV, STV, TBC, Salmonella and parasites.

III. 2.3.11 Support to Home and Small Scale Industries: Homes industries and small scale industries supported by Perumperhutani are:

a) Wood home industries,

b) Non-Wood small industries, either individual business or cooperatives dealing with export or domestic market.

The objectives of the support are:

- To create more employment opportunity
- To increase value-added and
- To increase social welfare.

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38 Ibid
PLATE : 16. Exploitation on Clear Cutting Area of Teak Forest

PLATE : 17. Prunning of Young Teak Stand
Service attained up to now are:

1. supports 42 home industries, namely in East Java 21 groups, in Central Java 11 groups and in West Java 10 groups.
2. Establishment of special log yard in Jepara, Central Java to serve local wood Carvers.
3. Establishment of special log yard to serve wood sculpture in Bali.  

III. 2.3.12 Organization and Manpower

Perumperhutani is managed by a Board of Directors, Consists of President Director, Director of Production, Director of Marketing, Director of Finance and Director of General Affairs. The President Director is responsible to the Minister of Forestry.

Each unit of Perumperhutani managed by the Head and the Vice-Head of Unit. The head of unit is responsible and reporting to the President Director. A unit is divided into Forest Districts, i.e. forest management unit covering 30,000-100,000 hectares forest.

III. 2.3.13 Research and Development

Research and Development efforts being carried out covering among others tissue culture, silviculture system and logging practices. In industrial field further processing of non-wood products and treatments of lesser known wood are being developed. These efforts are to meet the challenges of shortage in timber in the near future.

III. 2.3.14 Forest Protection

Forest protection, especially against encroachment and destruction’s of forest stand by local people, two approaches are applied, namely prosperity approach and the regular law enforcement. The prosperity approach is developed using social forestry approach so called agro forestry system. This approach seems to be successful, where the welfare of local people increases while the forest stands are in good condition.

These management efforts are the process of making and effectuating decisions or plans to meet peoples aim, purpose and aspirations. The purpose of the management is split in the policy.

Therefore, management is inextricably entwined with decisions of policy so that the definition of management must be extended to include it. Without proper policy there is no use of management. So the next chapter is based on Indonesian Forest Policy.
PLATE : 18  Teak Log Stacks on a Logyard

PLATE : 19  Pine Logyard