SUSTAINABILITY OF FOREST UTILIZATION OF INDONESIAN TROPICAL RAIN FOREST IN DECENTRALIZATION ERA

THESIS

A thesis submitted in partial fulfillment of the requirements for
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DOUBLE MASTER PROGRAMME

**DEVELOPMENT PLANNING AND
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INSTITUT TEKNOLOGI BANDUNG**

AND

**ENVIRONMENTAL AND INFRASTRUCTURE PLANNING
FACULTY OF SPATIAL SCIENCES
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ABSTRACT

SUSTAINABILITY OF FOREST UTILIZATION OF INDONESIAN TROPICAL RAIN FOREST IN DECENTRALIZATION ERA

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In line with decentralization conducted in Indonesia there are shifts of governmental administration toward forest resources characterized by more significant roles of regional authorities toward forest resource management. Forest utilization has been significantly affected by such changes which occurred because forest resource is used as vehicle to promote economical development.

The study has three objectives; elaborate the changes of forest management within the aspects of institutional and legal framework and current forest utilization practices; view forest utilization practices from the perspectives of sustainable forest management concepts and sustainability concepts; and describe the trends of forest utilization practices within the perspectives of sustainable forest management and sets up the recommendation for improvement of forest utilization practices.

The study concludes that Indonesian forest utilization has been adopting sustainability concept on formal institutional framework of forest management. However, in practices, there is limited recognition of maximum capacity of forest resources, based on its carrying capacity, exceeding forest capability to regenerate as consequences of the adoption of neoclassical development approach which emphasized on economical growth. It results in massive forest degradation and deforestation processes which lead to unsustainable forest utilization. Current forest utilization practices in decentralization era tend to gain economical aspect but limited achievement toward social and forest sustainability.

The study recommends adopting strong sustainability approach of forest utilization practices implemented by conducting forest utilization practices based on resource based management of forests, through the establishment of forest stands and areas, which is relevant to its capacity to produce sustainable flow of timbers and maintained forest resources. The economical aspect of forest activities, related to demands on forest timbers, has to be conducted on the basis of forest capacity to support such demands while social aspect is determined by securing local customary communities related to their rights and property through legal framework establishment and community empowerment on the fields.

Keywords: *Forest Utilization, Sustainable Forest Management, Sustainability Concepts, Institutional Framework and Decentralization*

GUIDELINE FOR USING THESIS

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For about thirteen years I have been actively involved in forest utilization practices both as an employee of a forestry private company and government officer where each of these professions has been enriching me with the insight of forest management. Based on those experiences and reflection on current forest management practices, I wonder how the sustainability concept is viewing the current forest management. Therefore, I have applied for master program which relevant with my curiosity. The Double Degree Program of ITB-RUG has given me an opportunity to grasp theoretical and global perspective of sustainability on natural resource management including forests.

Current forest management practices are needed for such changes in development perspectives and paradigm. Forest with its natural characteristics needs specific treatment in order to achieve the balance aspects of sustainability whether environmentally, socially or economically. However, environmental capacity has to be a baseline for such social and economic activities including forests. Therefore, development planning has to be conducted from "inside out" instead of "outside in".

For this opportunity, above all, I would like to thank God for all this blessing which enable me to finish my study in RUG. Without His blessing I would not be able to pass through my education in Netherlands. I confess that you are the all mighty and the All Merciful.

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DANANG KABUL SUKRESNO
Groningen
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GLOSSARIES

AAC	*Jatah Tebangan*, Annual Allowable Cut
Dinas Kehutanan	Provincial Forestry Services
Dinas Kehutanan Kabupaten	Municipal Forestry Services
DPRD	*Dewan Perwakilan Rakyat Daerah*, Provincial or Municipal House of Representative
DR	*Dana Rebosisasi*, Reforestation Fund
HPH	*Hak Pengusahaan Hutan*, Natural Forest Concession
HPHH	*Hak Pengusahaan Hasil Hutan*, Right of Natural Forest Utilization
HPHH 100 Hectares	*Hak Pemungutan Hasil Hutan 100 Hectar*, Small Scale Concession of 100 hectares
HPHTI	*Hak Pengusahaan Hutan Tanaman Industri*, Right of Plantation Forest Concession
HTI	*Hutan Tanamant Industri*, Industrial Plantation Forest Concession
HTI-Pulp	*Hutan Tanaman Industri-Pulp*, Industrial Plantation Forest Concession purposed to supply Pulp Industries
HTI-Sawnwood	*Hutan Tanaman Industri-Pertukangan*, Industrial Plantation Forest Concession purposed to supply Sawnwood Industries
HTI-Trans	*Hutan Tanaman Industri-Transmigrasi*, Industrial Plantation Forest Concession purposes to involve transmigrant as workforce and to establish transmigration
IHH	*Iuran Hasil Hutan*, Forest Product Royalties
Inhutani	State Owned Company in Forestry Sector
IPK	*Ijin Pemanfaatan Kayu*, Rights of timber extraction
IUPHHK-HA	*Ijin Usaha Pemanfaatan Hasil Hutan Kayu dari Hutan Alam,* Forest Utilization Rights of Natural Forest
IUPHHK-HT	*Ijin Usaha Pemanfaatan Hasil Hutan Kayu dari Hutan Tanaman,* Forest Utilization Rights of Plantation Forest
Kanwil Kehutanan	*Kantor Wilayah Kehutanan*, Provincial Government Line Agency
NGO	Non Governmental Organization
PAD	*Pendapatan Asli Daerah*, Regional Revenue
Perda	*Peraturan Daerah*, Regional Regulation
PMDH	*Pembinaan Masyarakat Desat Hutan*, Community Forest Development
PSDH	*Provisi Sumber Daya Hutan*, Forest Resource Rent Provision
RTRWP	*Rencana Tata Ruang Wilayah Propinsi*, Provincial Spatial Plan (PSP)
TGHK	*Rencana Tata Guna Hutan Kesepakatan*, Forest Land Use by Concensus (FLUC)

Chapter 1 INTRODUCTION

This chapter gives elaboration on research design aimed to give basic framework of the research conducted. The research is aimed to assess the trends of forest management under decentralization era within the perspective of sustainable forest management. In order to give good illustration, the research focuses on one aspect of forest management called forest utilization which has significantly been affected by transformation processes which occur during decentralization process.

In order to introduce the framework of the research, this chapter is organized into several sections : background, problem statement/description, research objectives, research questions, research methodology, theoretical framework, and thesis structure.

1.1 Background

The Roles of Forestry Sector in Indonesia

Forest management practices of tropical rain forest have, initially, been started since the enactment of Forestry Law No. 5/1967 which is now regenerated by the Forestry Law No. 41/1999. Forest resources are defined, based on chapter 3 article 4 (No. 41/99), as owned by the state which functions, as for protection, conservation and production. Among these forest functions, forest used for production is considered as the most realistic forest function affected by decentralization process happened and determines both the national objectives in forestry sector and the forms of forest management in Indonesia.

Based on section 1 article 1 of Law No. 41/1999, it is defined that forestry refers to integrated management systems concerning forest, forest areas and forest

products. The principle of forest management, based on chapter 2 articles 2, is to conduct benefit, sustainability, nationality, justice, togetherness, openness, and integrity. The goal of forest management, based on chapter 2 article 3, is to achieve the prosperity of people through justice and sustainability. In order to implement the goal the government promotes the establishment of forestry enterprises is decided whether by stated owned, private owned, cooperation, or in cooperation among them. Forest management on production forest, in common, refers to the productivity of forest considered as practices of forest utilization. While, based on Governmental Act No. 6/99 in chapter 4 article 5, there are two general forms of enterprises involved in the forest management, namely Natural Forest Concession or ***Hak Pengusahaan Hutan (HPH)*** and Plantation Forest Concession or ***Hak Pengusahaan Hutan Tanaman Industri (HPHTI),*** which during the time there are some changes in terminologies of these two to become respectively as Permit for Timber Forest Product Exploitation of Natural Forest (PTFPE-HF) or ***Izin Usaha Pemanfaatan Hasil Hutan Kayu Hutan Alam (IUPHHK-HA)*** and Permit for Timber Forest Product Exploitation of Planted Forest (PTFPE-PT) or ***Izin Usaha Pemanfaatan Hasil Hutan Kayu Hutan Tanaman (IUPHHK-HT)***.

Forestry sector has significant roles in national income defined as the second income source after oil and gas sector. It also involves significant number of employment which reaches around 40 until 60 million people (Blomkvist, 2000, Minangsari, 2003). The main forestry activities connected to forest utilization are nursery, plantation, maintenance of trees, harvesting, selling of timber, etc.

In term of land covering, forestry sector controls most of the Indonesian land characterized by forest. Blomkvist (2000) stated that forestry sector is responsible for the whole forest areas in Indonesia lying approximately 70 % of Indonesia's land. It means that forestry sector significantly determines the sustainability of natural resource management held in Indonesia.

In relation to promote national economical growth tropical rain forests have been exploited in order to increase national income. Minangsari (2003) stated that gross national income on forestry sector in 1996 reached of 6 million dollars and on 1974 it increased and reached of 564 million dollars and become prime mover of national development. Achmaliadi, et all (2002) stated that, in 1997, forestry sector and related industry are accounted for 3.9 percent of Gross Domestic Product and exported forest product valued at $ 5.5 billion equal to 10 percent of total export earning.

In relation to national development, Blomkvist (2000) stated that forestry sector in the Indonesian context sets the contribution to:

- Generation of wood-based products
- Industrial development and generation of employment;
- Development of infrastructure (roads, ports, and loading facilities) in remote areas;
- Increase tax return and revenue to the Government;
- Generation of foreign exchange earning.

Decentralization in Forestry Sector

In line with decentralization process occurred in Indonesia since 1997, there is also decentralisation of forest administration in forestry sector which characterized by the changes of forest resources management held by the three tier layers of governmental organizations namely central government, provincial government and municipal government. There are shifts of functions of government including forest policies and management (Achmaliadi, et al, 2002).which reflected the changes of authorities and responsibilities on forest resources.

The decentralization in forestry is coloured by struggle of power between the three tier layer of governmental institutions over forest resources management

related to forest stands and forest lands. Besides, there are also disharmonies between forestry sector and regional government toward forest management authorities as Achmaliadi et al (2002) concluded that regional governments tend to refer to two regional autonomy regulations namely Law No. 22/99 and No. 25/99 over forest resources determined as included in their authority over natural resources while the forestry sector refers to Law No. 14/99 which in certain aspects seems to lack of simultaneous practices.

Within forestry sector, decentralization of forest resource management is conducted based on several forestry regulations determining authorities and responsibilities of forest utilization of different layer of forestry services ranging from forestry planning to forestry harvesting. Referring to decentralization defined by Roundinelly (1983), based on Governmental Act No. 34/2002, there is delegation of authorities and decision making from central government forestry ministries toward provincial forestry agencies previously conducted by central agencies located on the field named "*Kanwil Kehutanan*". Furthermore, there is delegation of certain roles of forestry provincial agencies toward districts and municipal forestry agencies.

1.2 PROBLEM DESCRIPTION

During decentralization process, there is a shift of forest management which significantly affects the state and sustainability of forest due to utilization practices. It is characterized by the shift of forest utilization defined as centralized system, significant roles of central government, towards more decentralized system determines more authority on regional institutions toward forest resources.

In relation to that, this study tries to describe the shift of forest management in decentralization era. It is conducted by elaboration on its relevant aspects in terms of policies, strategies and institution and forest utilization practices happened during this era. This study emphasizes on the shift of forest management

administration, the roles and responsibilities of public agencies within the three level central government, provincial government, and municipal government and on the struggle between forestry sector and other sectors, practices of forest management related to demand and supplies for forest product and its effect on social and economical aspects.

Furthermore, based on such changes in forest management, this study tries to evaluate what the trends of forest sustainability in decentralization era within the perspective of sustainable forest management. It is conducted by employing relevant principles, criteria and indicators of sustainable forest management in order to assess forest management practices and state of forest resources emphasized on the utilization aspect of forest management.

1.3 RESEARCH OBJECTIVES

The study starts by describing the forest management in the decentralization era by elaborating the changes of forest management within the aspects of institutional and legal framework, and actual forest management practices.

Based on the existing forest management in the decentralization era, the study will review these practices from the perspective of sustainable forest management concepts and, if necessary, of the sustainable development principles

Based on the two elaborations above, this study will define the trends of forest management within the perspective of sustainable forest management and set recommendation for such less sustainable forest management practices.

1.4 RESEARCH QUESTIONS

Based on the research objectives defined above, this study will answer the questions:

- What is the general description of the Indonesian forest utilization in the decentralization era?
- How are forest utilization practices in decentralization era being implemented within the perspective of sustainable forest management principles?
- What are the trends of forest utilization practices in decentralization era within the framework of sustainable forest management principles?

1.5 RESEARCH METHODOLOGY

In order to achieve the goal related to the research questions, the study will be conducted by defining limitation of study in several aspects in terms of scope of type of forest, forest managements, and principles criteria and indicator for sustainable forest management.

The scope of the study will explore the forest management on the aspects of forest utilization of both concession system of natural forest in natural forest utilization within PTFPE-HF and plantation forest utilization within PTFPE-PF which significantly defines the sustainability forest management practices in Indonesia. This aspect is chosen due to the fact that, among other aspect of forest management namely forest protection, forest preservation, and forest rehabilitation, forest utilization is one aspect which is significantly influenced by decentralization processes conducted in Indonesia.

Forest type researched is tropical rain forests which, in the Indonesia context, are only located on several islands, except Java Island, namely Sumatra Island, Kalimantan Island, Sulawesi Island, and Irian Jaya Island which have significantly

changed in terms of public administration and institutions due to euphoria of decentralization process.

In order to assess sustainability of forest management, the study combines the concepts of sustainability formulated both by ITTO and Muktamar et al (2000) who considered it is relevant with sustainability of forest management in the aspect of forest utilization. In relation to the characteristic of forest utilization, among other concepts on principles of sustainable forest management, the study will employ the principles proposed by Muhtamar et al, 2000 on "Criteria and Indicators for Sustainable Plantation Forestry in Indonesia" as follows:

- Ecosystem function is maintained and improved (according to ecological aspects)
- Human well-being is enhanced (social-economical aspects)

While criteria and indicators employed in this study are based on the formulation proposed by ITTO:
- Enabling condition for sustainable forest management;
- Forest resource security
- Continuity of flow of forest product of timber
- Social and economic aspects (benefit form forest)

Elaboration of sustainability of forest utilization will be conducted based on the principles, criteria and indicators of sustainable forest management determined by ITTO (for forest utilization) and CIFOR (for forest plantation).

Research method conducted in this study is descriptive method. It is held by describing related variables in order to collect detailed actual information to formulate the symptoms which occur and it is followed identifying and evaluating the related issues and problems. This research method is used to define the fact

and characteristics systematically and to make classification and organization of research object..

The strategy of study is conducted by studying relevant literature connected to the decentralization process, legal and institutional arrangement, concepts and practices of forest management and sustainable forest management. The required data are collected based on relevant sources consisting of book references, journals, case studies, secondary data statistic of forestry, and web.

Data analysis conducted is qualitative analysis in which data collection is conducted by elaboration of state of forest management and significant changes which are viewed from the perspective of sustainability of forest management. Assessment of the trends of sustainability of forest management is conducted by indicating the state and changes with principles, criteria and indicator of sustainable forest management. Assessment is held based on the tabulation of data collected in the forms of tables, graphics, and numbers which determine interpretation and description of the research object. Interpretation of data is employed in order to achieve general understanding and conclusions about the phenomena occurred which are compared with the theory employed in the study.

1.6 THEORETICAL FRAMEWORK

Under decentralization era, there is a shift of forestry policies reflected in the changes of administrative and regulatory authorities (Barr, 2001) which determine forest management conducted by governmental institutions. As consequence, there is also a shift of forest management from decentralized toward more decentralized forest management as determined by the increase of roles and responsibilities of regional governments.

The idea of decentralization policy is to cope with more efficient and effective forest policies implementation where regional governments are considered having

more understanding to deal with forestry practices in their area rather than the central government. However, there are some opinions saying decentralization affects significantly toward transformation of forest management within the perspective of sustainable forest management principles.

In dealing with sustainability of forest management, there are policies issued by both central and local government that define the implementation of forest management. Of course, within the shift of governmental administration, there are impacts which happen toward forest management practices needed for such evaluation of sustainability of forest resource in terms of ecological, social and economic development. Among forest management aspects, forest utilization is considered as the most significantly highlighted by national and international communities in relation to the needs for good implementation of sustainable forest management

International Timber Trade Organization (ITTO) defines sustainability of forest management as follow:

"Sustainable forest management is the process of managing permanent forest land to achieve one or more clear specific objectives of management with regard to the production of a continuous flow of desired forest product and services without undue reduction of its inherent values and future productivity and without undue undesirable effects on the physical and social environment".

It means that, within the aspects of forest utilization, forest management is related to efforts for maintaining and improving the forest resource base and continuity flow of forest product as defined on the objectives of forest management. It is conducted by considering sustainability aspects in place and time dimension preventing reduction of forest value and negative impacts on physical and social environment.

In order to illustrate theoretical framework of the study, the flow of theoretical framework is shown in Figure 1. The detailed elaboration of this framework is elaborated in Chapter 2.

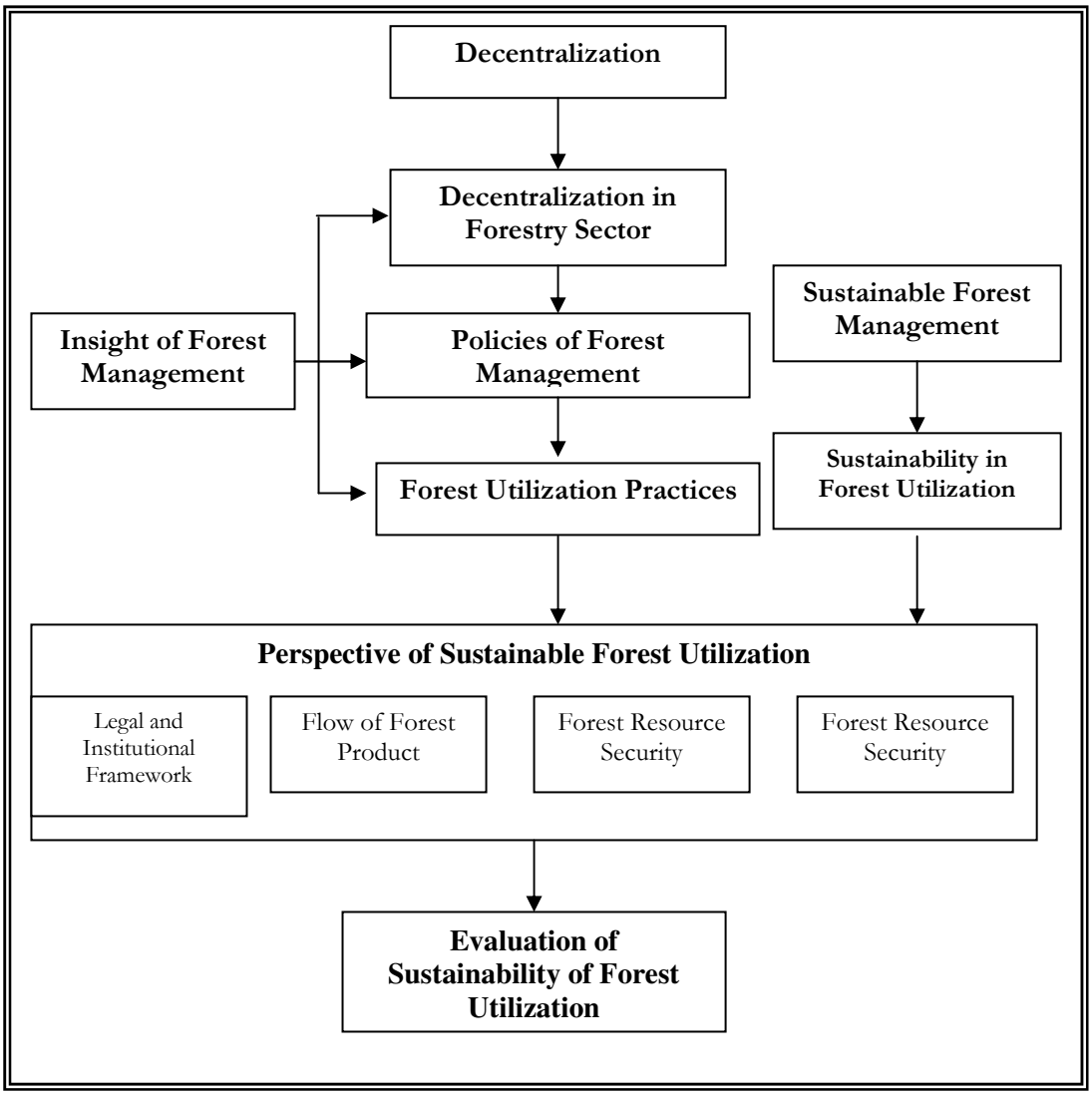

Figure 1.1 Theoretical framework of the research.

1.7 THESIS STRUCTURE

The structure of the thesis will be organized on five chapters. Chapter 1 introduces background, problem statement/ description, research objectives, research questions, research methodology and framework, and thesis structure. Chapter 2 elaborates theoretical framework and empirical practices of decentralization, forest management and sustainable forest management. In order to assess the sustainability of forest utilization practices, there is adoption of relevant principles, criteria and indicators of sustainable forest management. It is followed by the elaboration of forest utilization practices within the perspectives of sustainable forest management. Chapter 3 describes current forest utilization practices and related aspects that significantly influence the state of forest management practices in decentralization era. Chapter 4 views such forest management practices form the perspectives of sustainable forest management describing based on the result of collected information and discussing the relevant principles, criteria and indicators in order to formulate conclusions. Finally, chapter 5 states the conclusions and recommendations of current forest management practices in decentralization era. The detailed structure of study will be organized in some chapters as follow:

- Introduction
- Decentralization, Forest Management and Sustainable Forest Management
- Forest Utilization Practices in Decentralization Era
- The Application of Sustainability Principles in Forest Utilization in Indonesia
- Conclusions and recommendations

In order to investigate sustainable forest utilization conducted in Indonesia within decentralization era, there are needs for elaboration on both decentralization concepts and sustainable principles related to forest management in order to formulate appropriate criteria and indicators for forest utilization.

Chapter 2 DECENTRALIZATION, FOREST MANAGEMENT, AND SUSTAINABLE FOREST MANAGEMENT

2.1 DECENTRALIZATION

There are some definitions of decentralization in the Indonesian context basically related to shifts of management, authorities, and institutions taking roles. Based on some definitions, we can formulate that decentralization is a matter of "management transfer" (Yuwono, 2001) and "delegation of authority" Usman (2001), while Koswara (2001) defines it as "definition of authorities" respectively from central to lower level of government, between organs of the state, and from central government to lower tiers of government. Further it is described that in the Indonesian context, this shift is difficult to differentiate (Simarmata, 2000).

2.1.1 ADMINISTRATIVE DECENTRALIZATION

Since the implementation of Law No. 22/1999 and No. 25/1999, there are shifts of governmental administrations in many sectors except "the five sectors" which are still held by central government namely overseas politic, defence and security, justice, monetary and fiscal, and religions. These two laws define the new policies related to the shifts of decentralization authorities and responsibilities from central government to regional governments and fiscal balance between levels of government. Usman (2001) classified five basic principles for decentralization namely "democracy, community participation and empowerment, equity and justice, recognition of the potential and the diversity within regions and the need to strengthen local legislatures" which become baseline for decentralization implementation. Among other sectors, forestry sector is a sector being decentralized. Decentralization in forestry sector has gained attention from

national and international community for the needs of good implementation of decentralization processes[1].

There are some changes in roles and responsibilities between the three tiers of government namely central government, provincial government, and municipal governments which are characterized by more significant roles and responsibilities of regional government (provincial and municipal governments) in management forest resources. Within this perspective, there is delegation of authorities from central government to the provincial government. As consequences the function of field agencies located on the areas is replaced by the regional government (Usman, 2001).

The provincial government has dual status, as autonomous region as well as the representative of central government in the region. It is responsible for managing the particular aspects characterized by inter-municipal administration, or particular authorities which are not or not yet held by the districts and municipalities within its administrative boundaries (Usman, 2001).

The districts and municipalities take roles and responsibilities as defined in the Law No. 2/1999 within its administration boundaries. In the implementation, there is political and economical interest that influences the regional policies in order to control and manage the forest resources which also rearrange the institutional structures (Sumarmata, 2000). Furthermore Simartmata (2000) explains where this new governmental structures tend to establish the authorities to the districts and municipalities which create tension between provincial government against district and municipality governments.

[1] National and international institutions, namely Greenpeace, European Union, local NGOs, etc have been warning on limited performance on sustainable forest management since 2000 and degradation of conservation forests i.e. Tanjung Putting Forest Conservation (:see Lampung Post, April 26, 2006)

2.1.2 FORESTRY DECENTRALIZATION

2.1.2.1 Driving force of forestry decentralization

In line with decentralization processes which occur in Indonesia, there is pressure toward the central government to establish framework for more democratic political system and to decentralize governmental functions (Usman, 2001). These processes affect forestry sector characterized by more authorities for regional government toward forest management resources. One of the most reasonable aims of decentralization is based on the consideration so as to make the government implement its administration and services more effective (Usman, 2001) which is considered that regional government are more understandable and directly responsive toward the desires of its communities compared to the central government.

Usman (2001) states that based on the Law No. 22/1999 and Law No. 25/199 there are, at least, two basic principles namely equity and justice and community participation and empowerment that enhance the implementation of decentralization. The local communities claim for the benefit from abundant of forest resources exploited from their regions which are defined as unfair. The forest management held prior to decentralization era was considered as more benefit to the central government. Due to that condition, there are needs for more quote of forest resource benefit to regions. Thus decentralization becomes a momentum to store formal legitimacy of regional governments to carry out the task of governance more significant. Simarmata (2000) concluded that decentralization, at least, effects the changes of local regulation, revenue generation, control and management of natural resources and local government and institutions.

Prior to decentralization era, there were public opinions, which are considered as still valid up to now, which assumed that revenue from natural resource

exploitation included forest resource benefited the central government. It controlled heads of regional institutions namely governors and regents because they were assigned by the President and Minister of Internal Affairs respectively. While in forestry sector, field agencies of The Ministry of Forestry namely "***Kanwil Kehutanan***" has taken significant roles in conducting forest resource management in every region.

Therefore based on the Law No. 41/99 about Forestry and Law No. 32/2002 about regional government, the decentralization of forest management is conducted through:

- Decentralization through distribution of authorities and responsibilities from central forestry agency toward provincial forestry agencies and districts/municipal forestry agencies;
- De-concentration conducted by technical executor units within the umbrella of Ministry of forestry;
- Assistance task of regional forestry agencies toward authorities of ministry of forestry

This leads to more significant roles of the regional government and manage the authorities transferred to their regions. In order to conduct its new roles regional government implements some efforts related to policy and regulations and society empowerment.

2.1.2.2 The Creation of Local Regulation

As consequences of the increase of roles and responsibilities, regional government has to manage its public administrations which are decentralized from the central government. In dealing with such increases, many efforts are implemented. The most significant change which happened is the creation of local regulation

especially related to natural resources which are considered as the most common discussion both in the regional governments and the central government[2].

The most prominent goals of the creation of local regulation are to generate local income as stated by Saad (2001) where "*...the creation of more regulations concerning local taxes and levies, excluding income and assets* ". Furthermore, Usman (2001) stated that autonomous is closely related to " *the authority to manage and generate revenue* " held by local government as indication of successful implementation of decentralization. Although, there is a problem of mismatch between the raise of taxes and levies, excluding income and assets with the provision of services level by local government (Usman, 2001)

Simarmata (2000) stipulated that there were, at least, 6000 new Local Regulations (LR) or ***Peraturan Daerah (PERDA)*** which have been issued by 368 districts and municipalities, the 3000 laws out of which are considered as needs for revision causing contravention of higher laws. More detailed study conducted by Christanty in 2004 about 340 of LRs in 2001 resulted from 28 provinces were considered as inconsistence; even, some are betraying, higher level of regulations accounted for 35 (10%) are in very serious problems, 144 (42%) are in serious problems, and 58 (17%) are less serious problems.

2.1.2.3 Public Participation

Beside efforts for generation of local revenues, decentralization is considered as opportunity for more roles of community in social and economic activities. Usman (2001) stated that two among five basic principles of decentralization are to improve community participation and empowerment and to enhance equity and justice. Although, in practice, there are still weaknesses of such empowerment of

[2] There has been experiences of negotiation, although there is already formal regulation managing how it is implemented, conducting by some local and regional government with central government, especially region which has abundant of natural resources, for more share of natural resources extracted from their region (i.e. East and Central Kalimantan Government related to timber forest extractions).

society because decentralization in certain cases have impeded local community to participate more effective in development process due to “domination of elites” (Simarmata, 2000) over less power of society classes. However in bright side there are NGOs in national and regional levels established as representation of community interests to criticize governmental administrative practices and natural resource exploitation in order to achieve better performance related to governance, accountability, sustainability, equity, etc.

2.2 FOREST AREAS AND LAND TENURE

Determination of forest areas is based on Law No. 41/1999 providing authorities to Ministry of Forestry to establish forest management on forest areas. Prior to determination of forest areas in order to establish forest areas the Ministry of Forestry conducts coordination with related sectors and level of government to formulate definitive forest areas stated on “Integrated and Harmonization of Provincial Spatial Planning (PSP) and Forest Land Use by Consensus (FLUC).

Forest areas are defined as areas which are both proposed and administered by the government as forest consisting of two statues of forest areas stated on Section 2 of Article 5 namely State Forests and Private Forest. Forest utilization, as the objects of this study, is located on the state forest classified on permanent forest areas with production function of forest areas (Law No. 41/1999). State forests are defined as forest without private right over its lands which can be managed either based on formal regulation or controlled by custom communities based on custom law (Nanang, 2000). Management of state forests can be conducted by state corporate, privates, or communities with no rights for both ownership of forest and transfer of management among parties without government permits.

Law No. 41/1999 recognizes customary forests or ***Hutan Adat***[3] based on Custom Law or ***Hukum Adat*** as stated on Section 2 of Article 5 but would be included in state forest if there is no evidence for such existence. Furthermore, among others there are two main Social Forestry Programs which reflect participation of communities on forest management namely Community-based forest management or ***Sistem Hutan Kerakyatan or SHK.*** It is defined as customary forest management systems by the local people, especially the indigenous people, in the form of Community Forestry Concessions. .

2.3 FOREST UTILIZATION

Forest management is related to effort in managing forest resource which is relevant to the objectives of the defined planning by implementing several activities. Nogroho (2002) stated that forest management is related to the application of relevant technical aspects on forest stands in order to maintain and improve the sustainability of forest function.

2.3.1 Forest functions and classification

Forest management is held based on sustainability concept of its function namely conservation, protection, and utilization. The function of conservation and protection are held by maintaining and improving its existence while utilization is held by extracting its increment as maximum limit of production. Based on determined forest function, forest management policy, there are some policies that define the administration and practices toward forest resources

According to Law No. 41/1999, forest functions are classified as protection, preservation, recreation, and production. Therefore, based on forest functions, there is classifications of forest areas namely conservation forest, protection forest

[3] ***Hutan adat*** is forest areas within custom areas as part of community life cycles (Raden B. and Nababan A, 2003. at http://dte.gn.apc.org/AMAN/publikasi/Pengelolaan_Hutan_Berbasis.html at July 20, 2006)

and production forest. Conservation forest is aimed to conserve animal and species which exist in the forest and maintain its ecosystem. Protection forest is proposed to support life system, maintaining hydrological system, prevention of flood, erosion control, prevention of sea water intrusion, and maintaining soil fertility. Production forest is forest which has function for production of forest product consisting of permanent production forest, limited production forest and convertible production forest where the criteria for forest land classification determining forest functions are based on degree of slope, sensitivity to soil erosion and degree of rainfall (Definition established by Agency Forestry Plan).

2.3.2 Policies, legal and institutional framework in forestry sectors

In relation to forest management the government, as stated on the National Forestry Planning, determines the **five main policies** in forestry sector namely **eradication of illegal logging, prevention and management of forest fire, re-structurization of forestry industries, rehabilitation and conservation of forest resources, and decentralization of forestry sector** (Ministry of Forestry). Wardoyo (2004) stated that current forestry policies, since 1999 afterward, has encompassed the practices of forest management met with sustainable principles as responses toward national conditions and international agreement on forest resource management. These policies are indicated on the Ministry Decree No. 576/1993 determining the criteria and indicator for Sustainable Management of Natural Forest and No. 610/1993 defining the criteria and indicator for Sustainable Management of Natural Forest on Unit Level.

The implementation of forest management consisting of forest arrangement, formulation of forest management planning, utilization planning and forest area which uses planning are concluded on the Government Decree No. 34/2002 where the implementation of sustainable forest utilization conducted by concessionaires as main requirement for lengthening of forest utilization permit stated on section 50. Therefore, the government conducts assessment for forest management performance of concessionaires section 81 article 1.

The assessments of forest management performance of concessionaires on natural forest concessionaires are conducted based on the regulation of Ministry Decree No. 4795/2002 and No. 206/2002 which respectively determine the criteria and indicator for sustainable natural forest utilization in unit level and the procedures for sustainability assessment of natural forest utilization performance. While sustainable assessment on plantation forest concession is conducted based on the regulation of Ministry Decree No. 177/2003 and 178/2003 which respectively defines the criteria and indicators for sustainable plantation forest utilization in unit level and procedures of sustainability assessment of plantation forest utilization.

Forest management of tropical rain forest has been implemented since 1967 until now. It is signed by the establishment of First Forestry Law No. 7/ 1967 which is currently replaced by Law No. 41/1999. This regulation becomes the framework for all forestry regulations applied in the whole aspects of forest management. It defines the control of government over the status of forest which is basically state owned forest or community owned forest. It also determines the functions of forest resources namely protection, conservation or production in order to achieve prosperity of society stated in chapter 5 and 6 by still considering the existence of community ownerships.

Within the production of forest function in the aspect of forest utilization, chapter 3 of Law No. 41/1999 determines that forest management practices consisting of forestry planning, forestry implementation and controlling. Forestry planning consists of forest inventory (provincial, municipal, and unit level), inauguration of forest area (legal aspect of forest area), structuring forest areas (functional and use of forest), forming forest management region (provincial, district and unit level), and arrangement of forestry planning (based on scale of planning, and forest functions).

In 1970 the government issued the concession system of timber industries allowing concessionaires to extract woods from certain forest area (Christanty, 2004) which become the main scheme of forest utilization in Indonesia. The establishment of concessions is initiated by application proposed by candidate of concessionaires whose applicants have to propose on working planning namely Forest Management Planning (RKPH), Fiveyear working planning (RKL) and Yearly working planning (RKT). Legalization of concessions on the certain forest areas needs recommendation from Governor, under assistance of Provincial Forestry Services, stating support and area allocation.

In implementation, forest administration on fields is conducted by decentralized agencies named "*Kanwil Kehutanan*" as representation of Department of Forestry in the regions. The regional forestry services in provincial level give recommendations for the authentication of forestry planning of concessions in yearly bases, while monitoring and evaluation for the legalized yearly working plan of concessions are conducted by forestry services in municipal and districts level accordance under their administrative authority.

In decentralization era, under Law No. 22/1999 and No. 25/1999, there are institutional changes in administrating forest management practices. Within this new public administrative system, there is disbandment of field agencies of Department of Forestry named "*Kanwil Kehutanan*" whose authorities and responsibilities are held by the Provincial forestry services named "*Dinas Kehutanan Propinsi*". Through de-concentration, this institution executes decision making authorities and financial management from Kanwil Kehutanan toward Dinas Kehutanan Propinsi (Chrystanti et. al. 2004, Hutabarat, 2001).

Under Law No.25/2000, on the chapter II section 2 articles 3, Provincial government through provincial forestry services has authorities to define the criteria and standard for status and function of forest area and determines forest management and forest utilization. Furthermore, this institution has authorities, in

cases concession which lies on two or more municipal administrative boundaries. The provincial forestry services take authorities and responsibility for recommendation as defined on chapter II section 3 articles 1 and take authorities, based on article 3, in the case of municipals in which, within its administrative boundaries, they can not conduct their authorities or trans-boundary authorities arranged under agreement of related municipal governments as stated on article 4.

Ministerial decree No. 09.1/Kpts-II/2000 defines that long-term and middle-term forest management planning, respectively concession cycle and five year forest management plan, of concession is legalized by Ministry of Forestry by considering recommendation from provincial forestry services while short-term forest management planning named "yearly forest management plan" is legalized by Provincial Forestry Services by considering relevant Municipal Forestry Services.

Based on chapter 1 of Governmental Decree No. 6/1999, it is defined that forest resources are as state owned. In order to manage the benefit from the forest, the government arranges forest utilization in the form of concession which consists of two types of forest concession namely natural forest concession and plantation forest concession as stated on chapter V. Concession right is delivered through application, offering or auction distinguished based on the large of the forest area intended on article 6.

In order to control demand of timber from forest, there is assessment of forestry industries named upstream of wood processing industries (Industri Pengolahan Kayu Hulu) based on Government Decree No. 34/2002 section 57 article 2 and 3 which respectively determines the three yearly assessment conducted on performance of forestry industries and criteria and procedures for forestry industry assessment. Referring to this regulation stated on article 57, there are regulations determining the assessment implementation namely Ministry Decree No. 6884/2002 and No. 303/2003 which respectively define the criteria and

procedures for forestry industry evaluation and procedures of forestry industries assessment.

2.3.3 Silvicultural systems

In forest management practices, there is silviculture system employed to manage the forest stands. There are some definitions of silviculture which, in common, emphasized on forest function and maintaining its ecosystem. Smith (1986) stated that silviculture applies relevant "treatments" toward forest stands in order to "maintain and enhance its utility for particular purpose while Nyland (1996) emphasized on the sustainability of forest on "ecological functions" and "forest ecosystem". In this study, silviculture system conducted is aimed to manage forest stands in order to produce timbers. Some definition of silviculture can be illustrated as below:

"Silvicultural practice consists of the various treatments that may be applied to forest stands to maintain and enhance their utility for any purpose" David M. Smith (1986)

"Silviculture also ensures the long-term continuity of essential ecologic functions, and the health and productivity of forested ecosystems" Ralph Nyland (1996).

"Silviculture is the art and science of controlling the establishment, growth, composition, and quality of forest vegetation for the full range of forest resource objectives" [4]

"Silviculture is the art and science of controlling the establishment, growth, composition, health, and quality of forests meet diverse needs and values of landowners and society on a sustainable basis".[5]

[4] The definition can be found on(***http://www.for.gov.bc.ca/hfp/training/00014/chap1frt.htm***)
[5] The definition can be found on (http://en.wikipedia.org/wiki/Silvicultural)

Generally silviculture system employs planned program toward whole life of forest stands conducted in order to achieve certain objectives namely timber production, wildlife improvement, water quality, recreation and aesthetics purposes or in the combination of them. There is also consideration on aspects of calculation of forest products produced and regeneration of forest stands.

Based on the age composition of stands, there are two type of forest stands which exist in Indonesian forest management practices namely even-aged stands and uneven-aged stands. Based on level of human intervention, Evan (2000) classifies forest resources as "undisturbed forest", "forest modified by human named "semi-natural forest" and forest created by human kind named "forest plantation".

Semi-natural forest exist through the implementation of forest management and the use of forest resources in order to achieve the goal and objectives of forest management by employing relevant silviculture system namely single tree selection system, group selection system, strip selection system, etc. [6] In practice, type of forest is characterized by un-even aged stand and natural regeneration of forest stands.

Artificial forest is established through conducting the afforrestration or reforestration (Evan, 2000) by applying artificial plantation on forest lands. There are various silviculture systems employed namely strip clear cut system, block clear cut system, etc. [7](This forest stand is characterized, mainly, by even aged stands and species planted on one compartment, part of concession or the whole concession.

In the Indonesian context, even-aged stands of tropical rain forest occur in forest plantation forest under clear cutting and replanting system. Even-aged stands rarely occur in natural forest stands. Normally, it exists only after being impacted by particular regeneration treatment namely replanting, coppicing, etc which

[6] The definition can be found on (http://www.for.gov.bc.ca/hfp/training/00014/varclear.htm# clear)
[7] The definition can be found on http://www.for.gov.bc.ca/hfp/training/00014/varclear.htm#clear)

intend to form monoculture consisting of one species. These stands are characterized by almost uniform of stand diameter or "bell-shaped diameter distribution" with small part of forest stands growth under average common growth rate of entire stand. There is a definition of even-aged stands as follow: In even-aged forest, there is rotation determined the cycle and regeneration of stands as defined on the forest management plan.

"Even-aged stands generally have one age class, although two age classes can be found in some two-layered natural or managed stands. These stands generally have a well-developed canopy with a regular top at a uniform height" [8].

While uneven-aged stand is forest stands characterized by randomized age classes within stands defined as "multi-cohort" or all-aged" or, if any, small school part of even-aged. Stand's age distribution is influenced by "a perpetual cycle of random disturbances" which results in "scattered mortality" making age-classes distributed in the entire stands. Individual stand competes for light caused by canopy obstruction and struggle to survive against wind, insects or disease threats. These characteristics of forest, in the Indonesian context, exist in natural forest stand of tropical rain forest defined as uneven-aged stands of forest

Management of natural forest is employed, among others to reduce randomness of forest in order to make natural stands more predictable in term of "stand development" prediction of stands and through "regeneration cuts" in order to get effect on "perpetual regeneration". There is, among others, a definition of uneven-aged stands as follow:

"***Uneven-aged stands have at least three well-represented and well-defined age classes, differing in height, age, and diameter. Often these classes can be***

[8] The definition can be found on (***http://www.for.gov.bc.ca/hfp/training/00014/ chap1frt.htm***)

broadly defined as: regeneration (or regeneration and sapling), pole, and mature (or small and large sawn timber" [9]

In forest management, there are two types of silviculture systems employed in Indonesia namely selective cutting system and clear cutting and replanting system. These two silviculture systems are significantly different.

The selective cutting system is employed on the existing forest stand characterized by climax stands of forest. The level of extraction of forest stands is defined based on the limitation of increment of forest stands. Exploitation has to be conducted on the level which is the same or less than the level of increment of forest stands in order to maintain the remaining forest stands to growth and achieving the climax forest through its natural processes.

The clear cutting and plantation is conducted on the forest land started by plantation of forest species which is physically in accordance for raw material supply of wood processing industries and economically beneficial in term of its maintenance and value. The physical and economical interests determine the type of species and cycle of forest plantation. It refers to selection of species physically determined as fast growing species which have high value for wood supply of wood industries. The cycle of forest species determines the size of forest area and number of compartments used in order to arrange minimum harvesting which economically benefit held in every year until harvesting conducted on the initial compartment.

Forest management in this step is held by the application of two silviculture system. A selective cutting and replanting system (TPTI) is applied for natural forest management. It is held since 1989 based on the decree No. 564/KPTS/IV-BPHH/1989 modified by 151/KPTS/IV-BPHH/1993. This system is based on the

[9] The definition can be found on *(http://www.for.gov.bc.ca/hfp/training/00014/ chap1frt.htm)*

35-year of cutting cycle. Clear cutiing and replanting system (THPB) is applied for planted forest management. It has been held since 1990 based on the Government Decree No. 21/1970. This cutting cycle of this system is based on the type of tree species which is technically and economically defined as mature trees

2.3.4 Timber Extraction on Natural and Planted Forest Utilization.

Natural forest utilization is employed with the application of forest concession mostly private sectors. It is applied based on the Governmental regulation No. 21/1970 and aimed to utilize natural forest. Within this scheme, forest management is conducted on the particular groups of forest stands and or separated to achieve benefits based on its function in sustainable manner.

Planted forest utilization is employed for the purposes on the land productivity improvement of forest land. It is conducted, after exploiting the remaining stands, by replanting the less productive of forest land to be more productive ones. This forest development scheme is conducted based on the Governmental Decree No. 7/1990.

Production of timber in natural forest is based on the increment resulted from stand growth of climax forest. Various species in forest stands have specific characteristics of increment level. The fast growing species has more increment than the less growing species. Within this various species, stand increment is defined based on the average increment consisting of all existing species which naturally equals from time to time. Naturally, increment which happens in natural forest leads the mechanism where younger stand will replace the existing stands caused by death, damage, or emulation within its ecosystem mechanism. This mechanism defines the total volume of forest stand constantly from time to time called as climax forest. Management toward this stand is held by utilizing the replaced stand by applying selective cutting of the old and mature trees which are economically valuable and giving opportunities for younger trees in term of space and light, seedling, sapling, and poles, to replace them. Efforts to improve

regeneration are held, among others, by applying replanting on the open space and pruning on the surrounding trees.

In even-aged forest stands, production is conducted based on the maturity of stand in terms of physical and economical values. The period taken for reaching maturity of stand depends on the biological characteristic of species. Management is responsible for maintaining and improving biological growth of stands in order to achieve maximum increment. It is held, among others, by conducting selection, pruning, weeding. Harvesting is conducted after stand growth reaches maximum annual increment. In order to maintain the sustainability of timber production, the concession is divided into compartments as unit of stand in number in accordance with the number of years of species to reach its maturity and maximum increment.

2.3.5 Concession Systems

Concession is defined as business agreement under a contract or license in which the concessionaire has the right to exploit the object of business within particular area. There are responsibilities of concessionaire to fulfil certain requirement of payment namely fixed fee, percentage of revenue or profit[10],

In Indonesian context, agreement on the right to conduct forest management is also held in the form of concession both for natural forest concession and plantation forest concession. On the one hand, concessionaires have the right to exploit particular forest resource stipulated on agreement in sustainable manner. On the other hand, based on Governmental Decree No. 6/1999, concessionaires are responsible to fulfil the payment requirements for, namely, reboisation fund, forest resource provision, forest utilization fee.

Forest concession determines the right for forest product utilization within certain duration of time (paper work No. 1 of ICW and Green Economic Indonesia, 2004) which, in Indonesia context, consists of natural forest concession and forest

[10] The definition can be found on (http://en.wikipedia.org/wiki/Concession_%28contract %29)

plantation concession. Activities included in natural forest concession are cutting, maintenance, protection, processing and marketing while in forest plantation concession are land clearing, seedling, plantation, maintenance, protection, harvesting, processing, and marketing.

Ferras et al (1998) in ICW paper work No.1 stated that concession, in forestry context, is defined as the establishment of right to exploit forest resources which belong to who right is given from government in the form of forest concession delivered whether through application mechanism or auction. One important requirement is that exploitation practices have to be implemented in a sustainable way.

Referring to Gray classification in ICE paper work No. 1, forest concession contract implemented in Indonesia refers to the area based contract. It means that the clause of large of forest area, not the quote of cutting volume, is determined in the forest contract which is accompanied by the requirement of concessionaire to conduct forest management and utilization.

Indonesia forests, within the total of 60 million hectares of production forests, are around 52 % which are allocated for the concession system and 24 % out of which are allocated for forest conversion.

Based on Government Decree No. 21/1970, Concession can be conducted by state enterprises, private enterprises or mixed enterprises located in Indonesia. A proposal for establishment of concession should be supported by the local government (provincial and or district/ municipal government). The concession of forest utilization is not including the ownership of the forest land.

Blomkvist, 2000 stated that concession has to fulfill the requirement for:
- Preparing forest management plans (20 years, 5 years and annual operations plan)

- Establishing a wood processing industry (this obligation was later revoked in the eighties)
- Managing the area based on the management plans
- Submitting data on request for control and evaluation
- Paying forest charges
- Complying with Labor Regulations

Furthermore, Blumkvist (2000) described that the candidate of concessionaires have to fulfill the entire requirement above. Otherwise, the government would revoke, based on the article 14 if:

- The entrance fee is not paid within the prescribed time
- The forest charges (IHH) are not paid
- There is no operation on the ground within 180 days the after award of the concession
- Work plans as prescribed above are not submitted on time
- The concession is abandoned
- After three warnings for misconduct from the Ministry, no corrective action has been taken by the concession holder

The concessionaire has the right to conduct silviculture system of selective cutting, processing, and marketing. Silviculture system of selective cutting consists of several silviculture activities, namely felling, regeneration, and protection. Product processing is related to further processing of log resulted from the felling activities to produce particular forest product such as moulding, plywood, sawn timber, etc.

In conducting concession activities, the concessionaire has to obey the defined forest management plan document, and current regulation, and also applying sustainable forestry and business principles.

Any disobedience conducted by concessionaire will result in sanctions in the form of administrative penalties (delaying of administrative services), cutting quota reduction, and revoking the concession.

Forest plantation concessionaire conducted based on Government Decree No. 7/1990 named Industrial Forest Concession (HPHTI). It gives the concessionaire, on certain forest area, to conduct planting, protection, maintenance, harvesting, processing, and marketing. The objective of this concessionaire is to support the related wood processing industry. It becomes the requirement of all Industrial forest concession before its establishment.

Silviculture system conducted in forest plantation concession is clear cutting with regeneration with activities are started from planting the tree and ended by harvesting the mature trees. Therefore, forest areas proposed for forest plantation concession are unproductive permanent forest areas which are defined to have commercial stands less than 20 M3 per hectares.

Forest plantation concession can be conducted by state enterprises, private enterprises, mixed enterprises, and cooperatives. Its forest area cannot be transferred and to other parties. The duration of concession is 35 year plus one cycle of selected trees planted. The establishment of forest plantation concession is established by the Ministry of Forestry with support and recommendation of provincial and or district/ municipal government.

The government requires the candidate of concessionaire to establish feasibility study of the project and plantation experiment. There are some obligations which have to be fulfilled namely payment of HPHTI fees and achieving plantation level of, at least, 10 % of the total area within five years of concession cycle.

2.4 SUSTAINABLE FOREST MANAGEMENT

Within the forest sector there are concepts related to sustainability setting criteria and indicators for sustainable assessment on such forest management practices. The assessment conducted on the forest management is related to enabling condition for sustainable forest management aspects, forest resource security and flow of forest products aspects, natural ecosystem and biodiversity aspects, and social, economic, and cultural aspects. Relevant with the object of this study, about sustainability of forest utilization, the criteria and indicators employed are enabling condition for sustainable forest management, forest resource security, flow of forest product, and social economic aspects. In order to give broader insight on forest management there will be elaboration on definition, principles and criteria and indicators selected for sustainable forest utilization.

2.4.1 Definition of Sustainable Forest Management (SFM)

As any other sectors, forestry has traditionally employed the principles of sustainable development. The sustainability concepts is held by enabling the efforts to achieve the balancing of the three roles of forest resources with regard to environmental, social and economical aspects. However, the environmental aspects of forest have to be the main consideration to maintain its other two roles. This mechanism is naturally proceeded subsequently and not in the other way around.

Even, there is further understanding of sustainable development defining the fully human society. It contains the poverty alleviation, population stabilization, employment creation, human right etc that have to be included in the frame of sustainable development (Gregopoulos, 2002).

Referring to ITTO the definition of sustainable forest management:
"*Sustainable forest management is the process of managing forest to achieve one or more clearly specified objectives of management with regard to the production of a continuous flow of desired forest products and services without undue reduction of its inherent values and future productivity and without undue undesirable effects on the physical and social environment*"

In order to assess sustainable forest management, there is system used to assess the forest management by testing criteria and indicators. There are various formulations of sustainability assessment on forest management, namely ITTO, CIFOR, FSC etc which basically respond to environmental, social and economical issues. The idea of the assessment is to provide relevant information on various phases of forest management, namely planning phase, implementation phase, control and impact phases of forest management (Muhtaman, 2000). In formulating the system of assessment, there is a hierarchy on principles, criteria, and indicators enabling this scheme to evaluate sustainability of forest management (Lammenrts van Bueren and Blom 1997, Prabu et al. 19999, and Muhtaman. 2000)

Principle employed in this study is related to the characteristic of forest utilization, among other concepts on principles of sustainable forest management, the principles proposed by Muhtamar et al, 2000 on "Criteria and Indicators for Sustainable Plantation Forestry in Indonesia". Principles provide a fundamental truth or law as the basis of reasoning or action in the context of sustainable forest management providing the primary framework for managing forest in a sustainable fashion justifying the criterion and indicator (Cifor, Poulsen, 1999)

Criterion refers to aspect considered important in sustainable forest management to be assed. A criterion is accompanied by a set of related indicators (ITTO). Cifor (1999) defines that

"*a standard that a thing is judged by A criterion can therefore be seen as a second order principle, one that adds meaning and operationally to a principle without itself being a direct measure of performance*".

Indicator is a quantitative, qualitative or descriptive attribute that when periodically measured or monitored, states the direction of change (ITTO). In this research, any variable or component of the forest ecosystem or the relevant management system is used to infer attributes of the resource and its utilization. It conveys single meaningful message. The "single message" is termed information representing an aggregate of one or more data elements with certain established relationships (Cifor, 1999).

2.4.2 Principles of Sustainable Forest Management

Sample et al (1996) stated that there is a way of viewing forest management including sustainability concept which reflects the shift in how to manage forest resources which do not focus only on producing timber but also on maintaining the quality of ecosystem. Sustainability concept of forest management is started by managing biological processes with socioeconomic interests of relevant actors within its place and time dimension. Forest management enhances the productivity of forest resources or sustained-yield forestry by implementing silviculture to maintain and improve timber production in order to fulfill human consumption. It is employed to prevent social economic disturbance related to deficiency of forest resources by utilizing renewable characteristic of forest resources

Within the forest utilization concept, forest management defined by Sample et al (1996) stipulates that forest resources are managed in order to produce yield periodically within sustained timber volumes. Within this management, even in improved management, there is no intention to increase the volume of production but rather to improve the quality of stands and yields. Increasing of production

will disturb the stability of stand's quality which in turn will decrease the result itself, at least, in the long term.

Sample et al (1996) defined that sustainable forest management is related to sustained-yield forestry, non declining-even flow, custodial management, and multiple uses. Sustained-yield forestry reflects the efforts to maintain the regular production of timber and preserve the natural processes of its productivity that lead to broader forest uses which secure forest existence. Non declining-even flow implies the annual level of timber production which is equal or less meet with the reversibility of forest to regenerate. Custodial management reflects the preservation of forest existence against threats namely illegal logging, forest fire, land conversion in order to maintain the forest ecosystem functions. While multiple uses imply the efforts to achieve the high level of various renewable product resulted from the forest periodically without decreasing the productivity of forest land.

By considering all relevant forest roles we will define the concept of sustainable forest management in proper way. This will lead to balance approach toward sustainable forest production and multiple forest functions as a representation of market and non market values.

2.4.3 Criteria and indicator

There are some formulation criteria and indicators of sustainable forest management proposed namely ITTO, CIFOR, Muhtamar (2000), Formulation of Ontario's forest, etc. which basically addresses the same objectives which reflect the sustainability concept of forest management covering all its aspects. In this study criteria and indicators employed are adopted from Sustainable Forest Management Formulation which proposed those three formulations in order to create most appropriate formulation in accordance with aspect of forest utilization by choosing relevant criteria and indicators employed.

This study adopts the formulation of sustainable forest management established by ITTO by selecting, among others, the most relevant principles criteria and indicator for forest utilization. The two principles adopted are maintaining and improving the ecosystem function of forest and Enhancement of human and well-being. The criteria adopted for this study are:

- Enabling Condition for Sustainable Forest Management;
- Forest resource security;
- Continuity flow of forest product and;
- Economic and social aspects (benefit from forest).

Table 2.1 The detailed indicators on the three criteria

No	Principles	Criteria	Indicator
1	Ecosystem function is maintained and improved	Enabling condition for sustainable forest management	Policy and legal framework National objectives for forest including production, conservation and protection The establishment and security of the permanent forest estate Land tenure and property rights relating to forest The control of forest management The control of forest harvesting The control of encroachment Number and adequacy of institutions to support sustainable forest management Institutional framework The adequacy of stake holder involved
		Forest resource security	Extent and percentage of total area Extent and percentage of total land area under each forest type Length and percentage of external boundaries of the permanent forest estate demarcated or clearly defined Area of permanent forest estate converted to permanent non-forest use Existence of procedures to control encroachment, fire, grazing, grazing, and illegal exploitation of forest
		Continuity of flow of forest product of timber	Extent and percentage of forest for which inventory and survey procedures have been used to define the quantity of the main forest products and resource rights and ownership The class or category of owner or right holder such as forest lands, both permanent forest and others The level of sustainable harvest from lands managed as permanent forest estate, by main forest product and other forest type The quantity or volume of wood being harvested from permanent forest estate and other forest lands
2	Human well-being is enhanced	community empowerment for human well-being	Land tenure and property rights relating to forest Employment; Investment and competitiveness; Contribution to national economy

Note: Modified based on Concept of Sustainable Forest Management proposed by ITTO

2.4.3.1 Enabling Condition for Sustainable Forest Management

The criterion of enabling condition for sustainable forest management refers to the evaluation of legal and institutional framework occurred in order to achieve sustainable forest management. This criterion consists of three subsections namely policy and legal framework, and institutional framework.

Policy and legal framework

This subsection is intended to evaluate the existing laws, policies and regulation in order to prevent forest from encroachment toward good forest management practices and involve local communities dependent on forest. Indicators used in this subsection are:

- National objectives for forest including production, conservation and protection;
- The establishment and security of the permanent forest estate;
- Land tenure and property rights relating to forests;
- The control of forest management;
- The control of forest harvesting; and
- The participation of local communities.

Institutional framework

This subsection evaluates the adequacy of stake holder involved in forest management in order to achieve sustainability. It refers to the needs for comprehensive approach of forest management. Indicators employed for enabling condition for sustainable forest management are as follows:

- Number and adequacy of institutions to support sustainable forest management
- The degree of public participation in forest management namely in planning, decision making, data collection, monitoring and assessment.

Tabulation of indicator employed for the criterion of enabling condition for sustainable forest management can be illustrated in table 2.2:

Table 2.2 Indicator employed for the criterion of enabling condition for sustainable forest management

No	No of indicator	Description
1	Indicator 1	Policy and Legal Framework - National objectives for forest including production, conservation and protection; - The establishment and security of the permanent forest estate; - Land tenure and property rights relating to forests; - The control of forest management; - The control of forest harvesting; and - The participation of local communities
2	Indicator 2	Institutional Framework - Number and adequacy of institutions to support sustainable forest management - The degree of public participation in forest management namely in planning, decision making, data collection, monitoring and assessment.

Note: Modified based on Concept of Sustainable Forest Management proposed by ITTO

2.4.3.2 Forest resource security

Criteria of forest resource security determines the establishment of forest in terms of forest stands and forest area as stipulated by ITTO formulation defines that it is related to "stability and security of a nation's forest estate". It refers to the level of existence and proportion of land under natural and plantation forest. Furthermore, it determines the call for protection and preservation of forest and the adoption of idea about forest in relation to its existence and functions based on time dimension (ITTO). It is relevant for national planning on forest resource management in economic development by still considering the achievement of sustainable development.

Forest resource security describe the condition of forest resource base in terms of land use for forest area, demarcation of forest area and its relation with other

sectors. It means that there is a need for securing “comprehensive integration land use plans” (ITTO).

Based on ITTO formulation, indicators employed in the criterion of forest resource security are:

Indicator 1: Extent and percentage of total area elaborating the condition of Natural forest; Plantation forest; Forest estate, and Comprehensive land-use plans.

Indicator 2: Extent and percentage of total land area under each forest type. This indicator values the existence of forest type based on forest functions and land uses of forest areas. It refers to elaboration on the existence of forest resources within and outside of permanent forest areas.

Indicator 3: Extent and percentage of external boundaries of the permanent forest estate demarcated or clearly defined. This indicator values the existing demarcation of forest which has been established and its improvement during the time, the institution is responsible for implementation and how the demarcation plan is achieved. It also evaluates the strength and limitation on application of this effort.

Indicator 4: Area of permanent forest estate is converted to permanent non-forest use. This indicator values the level of conversion of permanent forest estate to permanent non-forest use compared to baseline of forest land use, determined by the government, during the time. This indicator identifies to what extent the formal conversion of permanent forest is used for permanent forest use namely agriculture, infrastructure, settlement, etc and vice versa.

Indicator 5: Protection procedures This indicator values the level of the control instrument and its implementation toward forest resource base from human

intervention. There are some common forest threats needed to be controlled, namely encroachment, fire, grazing, and illegal logging. This indicator is aimed to secure the sustainability of the long-term investment in forestry sector in terms of sustained yield both forest goods and services. It refers to the elaboration of source of forest threats, the description of institution responsible for monitoring and control on forest resource, changes in procedures and its improvement happened and constrains occurred.

Tabulation of indicator employed for the criterion of resource based security can be illustrated table 2.3:

Table 2.3 Indicator employed for the criterion of resource based security

No	No of indicator	Description
1	Indicator 1	Extent and percentage of total area under: - Natural forest; - Plantation forest; - Forest estate, and; - Comprehensive land-use plans
2	Indicator 2	Extent and percentage of total land area under each forest type
3	Indicator 3	Extent and percentage of external boundaries of the permanent forest estate demarcated or clearly defined.
4	Indicator 4	Area of permanent forest estate converted to permanent non-forest use.
5	Indicator 5	Protection procedures

Note: Modified based on Concept of Sustainable Forest Management proposed by ITTO

2.4.3.3 Continuity Flow of Forest Product

This criterion, in this study, elaborates forest management aimed to produce timber which is sustained in the long-term in terms of economic and financial viability, and is environmentally sound and socially acceptable. It implies that forest utilized for timber production is still able to fulfil its other roles in terms of environmental protection and conservation of species and ecosystem. It refers to the multiple function of forest through the application of good forest management which maintains forest resource, sustained in terms of yield, and providing benefit to society. These criterion asses the sustainability of production in term of

quantity and quality produced effectively and appropriateness to the need for environmental secure and genetic resource.

In the criterion of flow of forest product formulated by ITTO, there are four subsections included, namely resource assessment, planning procedures, monitoring and evaluation, and management guidelines. In this study subsection is used resource assessment only which is considered relevant with the objective of the study. It is based on assumption that other three out of it namely planning procedures, monitoring and evaluation and management guidelines already exist.

Indicators used in this criterion are aimed to get information on:

- The extent of all forest land both permanent forest estate and others based surveys yield have been conducted;
- The class or category of owner or right holder of forest lands both permanent forest estate and others;
- The level of sustainable harvest extracted from the permanent forest estate based on main forest product and forest type;
- The volume of timber produced based on forest type from both permanent forest estate and other forest lands.

Indicator 1. Extent and percentage of forest based on inventory and survey procedures have been conducted to determine: The quantity of the main forest product; and Resource right and ownership.

Indicator 2. Estimate of level of sustainable harvest for each main timber for each forest. It refers to the evaluation on average annual level of sustainable harvest of timber in permanent forest estate according to forest type identified which still maintains the functioning of forest ecosystem.

Indicator 3. Quantity (volume) of timber harvested for each type of forest. It evaluates the volume of timber produced from forest and average annual quantity within permanent forest estate and others.

The detailed indicator employed for criteria of continuity flow of forest product can be illustrated on table 2.4:

Table 2.4 Indicator employed for criteria of continuity flow of forest product

No	No of indicator	Description
1	Indicator 1	Extent and percentage of forest based on inventory and survey procedures have been conducted to determine: - The quantity of the main forest product; and - Resource right and ownership
2	Indicator 2	Estimate of level of sustainable harvest for each main timber for each forest.
3	Indicator 3	Quantity (volume) of timber harvested for each type of forest

Note: Modified based on Concept of Sustainable Forest Management proposed by ITTO

2.4.3.4 Economic and Social Aspects

This criterion determines the economic, social and cultural aspects of forest to fulfil the basic needs of people living in and around the forest. It refers to the improvement of the welfare and quality of life of people in terms of employment.

In this criterion, there are three subsections namely socio-economic aspects, community participation, and community participation. In relation to the objectives of study, there is selection of relevant indicator selected in each subsection.

Socio-economic aspects

This subsection reflects the contribution of forest in order to generate financial resources both in national and regional level. Furthermore, it also elaborates the contribution of forest toward welfare of communities in and around the forest and

reflects the level of participation of communities on forest utilizations. The indicators employed are as follows:

Indicator 1. Value and percentage contribution of the forestry sector to the Gross Domestic Product

Indicator 2. Quantity (volume) and value of timber traded both in national and international markets.

Indicator 3. Employment in the forestry sector referring to:

- Number of employment;
- Percentage of total work force;

Community participation

This subsection reflects the accountability of forest management and concern toward local aspiration and interests employed in forest utilities practices. It needs cooperation and openness among relevant stakeholders in forest management namely forestry services, officials, concessionaires and communities.

Indicator 1. To what extent tenure and user right are documented and recognized.

Indicator 2. To what extent indigenous people and local communities, forest dweller and other forest dependent communities in forest-base their economic activities.

The indicators employed for the criterion of social and economic aspects consisting of social and economic aspects and community participation can be describe on table 2.5:

Table 2.5 Indicators employed for the criterion of social and economic aspects

No	Aspects and No of indicator	Description
I	Social and economic aspects	
1	Indicator 1	Value and percentage contribution of the forestry sector to the Gross Domestic Product
2	Indicator 2	Quantity (volume) and value of timber traded both in national and international.
3	Indicator 3	Employment in the forestry sector referring to: - Number of employment; - Percentage of total work force; - Average wage rate, and;
II	Community participation	
	Indicator 1	To what extent tenure and user right are documented and recognized
	Indicator 2	To what extent indigenous people and local communities, forest dweller and other forest dependent communities in forest-base their economic activities

Note: Modified based on Concept of Sustainable Forest Management proposed by ITTO

The following chapter will elaborate the practices of forest utilization within the decentralization era by providing insight on its changes and trends related to legal and institutional framework and technical aspects of forest utilizations.

Chapter 3 FOREST UTILIZATION PRACTICES IN DECENTRALIZATION ERA

In order to provide insights of forest utilization practices related to criteria and indicators formulated on chapter 2, this chapter will describe the legal and institutional framework of forest management both on strategic and operational regulations in order to investigate the criteria of Enabling condition for sustainable forest management. Criteria for Security of resource base and continuity of forest product will be related to technical and practical aspects of forest management and natural and social circumstances affecting such forest utilization practices. Finally criteria for well-being will be illustrated based on social and economical aspects related to forest utilization practices by elaborating related programs affecting national incomes and its contribution to social and economic development of communities in and around the forests.

3.1 GOVERNMENT POLICIES ON FOREST UTILIZATIONS

Forest management practices have been concerned of many parties namely conservationist, NGOs, communities, etc which basically promote the efforts to achieve the sustainable forest utilization. There are relevant efforts which have to be conducted. They are securing forest resources, balancing supply and demand mechanism of forest products, maintaining and improving forest resources, and decentralizing forest administration and delegating authorities to regional government. In order to promote those desired efforts, the government issued policies and regulations on natural forest concession, planted forest concession and provided baseline and guidance for sustainable criteria and standard of forest management practices.

Policies are implemented to provide guidance of forest management and to cope with disturbances toward forest resources both caused by man and natural processes such as illegal practices of timber extraction and forest fire, adjustment

of timber demand by harmonizing the potential supply and supply of timber and continuation process, and improving regional authorities to conduct forest management practices relevant with decentralization process. Within the practical level, forest policies, as stated by Wardoyo (2004), are concern with five policies related, those are eradication of illegal logging, prevention and management of forest fire, restructuring of forestry sector, rehabilitation and conservation of forest resources, and decentralization of forestry sector.

There is also adoption of certification of forest product as strategies toward sustainable forest management defined as forest management objectives and market prerequisite of forest product defined as trade objectives. It will be the official requirement and assessment of forest management practices and continuation of forest product. There is formulation of certification of forest product established by Indonesian Eco-label Institution or ***Lembaga Ekolable Indonesia (LEI)***. However this strategy is not so fluently implemented due to lack of readiness of forest management units.

Regulations promoting the sustainable forest management practices are imposed, as response, by international agreement on forest management determining that 2002 as indicating year for sustainable forest management. Therefore, there is adoption of criteria and indicator for sustainable forest management. Wardoyo (2004) stated that, at least, there are two regulations which initially started the adoption of criteria and indicator for sustainable forest management namely Forestry Ministry Decree No. 252/1993 replaced with 576/1993 about Criteria and Indicator of Sustainable Natural Production Forest and 610/1993 about Criteria and Indicator of Sustainable Natural Production Forest in Management Unit Level.

As a response to the need for required criteria and indicator of sustainable forest management in decentralization era there is Government regulation No. 34/2002 requiring the performance of criteria and indicators for sustainable forest

management for prolonging the current forest concessions as stated on section 50 article 2 and needs for independent institutions accredited by Forestry Ministry, based on section 81 article 3, to conduct the assessment toward sustainable forest management practices. Therefore certification seems to be based on the mandatory bases for concessionaires.

Regulations have been enacted consisting of determining criteria and indicators, procedures of assessment or evaluation on forest management and forestry industries as tabulated on table 3.1:

Table 3.1Regulations related to criteria and indicators of sustainable forest management and procedures of assessment

No	Regulation	Description
1	Forestry Ministry Decree No.4795/2002	about Criteria and Indicators for Productive Natural Forest Unit
2	Forestry Ministry Decree No. 28/2002	about Procedures for Assessment of Sustainable Timber Forest Utilization.
	Forestry Ministry Decree No. 178/2003	about Procedures for Assessment of Sustainable Planted Forest Utilization
3	Government Regulation No. 34/2002	about Criteria, Indicators, and Procedures for Evaluation on Industries
	Forestry Ministry No. 6884/2002	About Criteria and Procedures of Evaluation of Forestry Industries.
4	Forestry Ministry No. 303/2003	About Assessment Procedures of Performance of Forestry Industries.

Source: Ministry of Forestry (2005)

Within the supply side, as responses to regulate such requirement of criteria and indicators, the government established the regulation to assess the criteria and indicators for sustainable forest management both on natural forest concession and planting forest concession namely Forestry Ministry Decree No. 4795/2002 about Criteria and Indicator for Productive Natural Forest Utilization on Management Unit and No. 208/2002 about procedures of assessment of Sustainable Timber Forest Utilization and No. 178/2003 about procedures of assessment Sustainable Planted Forest Utilization. The main objectives of these

regulations are to maintain the quality of forest stand and to improve the productivity of timber potency of forest areas.

Within the demand side, there are assessments of forest industries defined as Up-streamed Wood Processing Industry or ***Industri Pengolahan Kayu Hulu (IPKH)*** for its performance on criteria and indicator of sustainable forest management as stipulated on Governmental Regulation No. 34/2002 section 57 which defines procedures and criteria for evaluation conducted every three year. This regulation is followed by Forestry Ministry Decree No. 6884/2002 about criteria and procedures of evaluation on forestry industries and No. 303/2003 about assessment procedures of performance of forestry industries conducted by independent institutions. The main objective of these assessments is to maintain the productivity of forest industries within the sustainable level of timber supply.

Basically, related to ***Restructurization Policy on Forestry Sector***, these two sides are to be managed in order to harmonize the level of forest timber supply with the level of demand of timber forest indicated on level of forest industry capacity. The policy is known as an effort to restructure the forestry sector which currently results in the further policies namely ***Soft Landing Policy***. This policy is implemented by declining cutting quote of forest production gradually based on sustainable production level of each region. For example the national timber production quote is 6,892,000 m3 in 2003 which in the following year, in 2004, was decreased to become 5,743,759 m3. The production quote of each region is determined by the Directorate General of Forestry Production Decree by considering the mount of reduction of production of concessions. This policy is intended to give opportunities for natural forest to growth and to reach the climax stands.

In order to reduce dependencies of timber supplies which are mainly sourced from natural forest, the government enhances the development of planted forest resulting timber to support and replace the role of industrial timber supply from

natural forest. Plantation forest development based on Government Decree No. 7/1999 is conducted on permanent forest areas[11] considered as less productive forest areas for improvement of its productivities. In the long term, forestry industries will be supplied by timber sourced from planted forest areas. This policy is supported by incentives provided by government through zero interest of development loan stipulated on Government Regulation No. 35/2002, sourced from Re-forestation Fund or ***Dana Reboisasi (DR)***[12], of plantation development collected from timber harvested from natural forests.

3.2 THE ESTABLISHMENT OF FOREST AREAS AND DEMARCATION OF FOREST BOUNDARIES.

As stated on Constitution 1945 article 33 forest resources are under control of state, considered as state owned forests. It determines forest existence and functions in order to guarantee its legitimate status, boundary lines, and size of forest areas. Among other purposes, namely conservation and protection, forests are also intended to maintain and improve economic development through utilization of forest product both timber and non-timber forest products.

Based on Law No. 41/1999 forest areas are determined by Ministry of Forestry through Ministry Decree. Prior to the determination of forest areas there was coordination in the level of government between central government represented by Ministry of Forestry, provincial, and municipal government, and integration of sectoral coordination among related parties involving Forestry Sector and other sector namely Agriculture and Estate Sector, Mining and Energy Sector, Infrastructure and Settlement Sectors, etc. Coordination in the level of government determines forest areas formulated based on Integrated and

[11] Permanent forest areas are considered as production forest areas promoted for sustainable forest production but neither on limited production forest areas and convertible productive forest areas (Planning Forestry Agencies, 2004)

[12] Dana Reboisasi (DR) is re-forestation fund collected from fee of timber extraction resulted from natural forest. It is issued on official announcement of central government. The amounts of fee is determined based on cubic and timber species extracted.

Harmonization of Provincial Spatial Planning (PSP) or ***Tata Ruang Wilayah Propinsi (RTRWP)*** while coordination among related sectors results in forest areas determining Forest Land Use by Consensus (FLUC) or ***Tata Guna Hutan Kesepakatan (TGHK)***. Based on those two coordination forest areas are, related authorities ratified within a province and governor which is finally signed by Ministry of Forestry as legitimate status of forest areas.

Up to 2004 Forestry Planning Agency (2004) reported that it had been designated forest areas in 24 provinces except for some provinces namely North Sumatera, Riau, Archipelago of Riau, Banten, Central Kalimantan, Gorontalo, North Maluku, and West Irian Jaya which are in underway.

Within the 24 provinces in 2004 there has been forest designation accounted for 108,338,935.28 hectares 57,526,095.69 hectares of which are for production forest consisting of 27,097,193.01 hectares of Permanent Production Forest, 16,202,462.26 hectares of Limited Production Forest, and 13,670,535.00 hectares the Conversion Forest. In the mean time, North Sumatera, Riau, and Central Kalimantan are in process of forest designation which already formulated draft designation of forest areas based on Forest Land Use by Consensus (FLUC) accounted for 28,376,392.00 hectares and Synchronization of FLUC-PSP accounted for 18,489,626.00 hectares as illustrated on the table below. The Ministry determines that within these provinces, prior to ratification of forest designation based on synchronization of FLUC-PSP, forest areas are determined based on FLUC.

Table 3.2 Total Forest Areas of The Provinces of North Sumatera, Riau, and Central Kalimantan Based on Forest Land Use by Consensus (FLUC) and Synchronization of FLUC-PSP.

Province	Forest Areas (Ha)	
	Based on FLUC	Based on Synchronization FLUC-PSP
North Sumatera	3,600,132.00	3,848,358.00
Riau	9,456,160.00	3,905,333.00
Central Kalimantan	15,320,100.00	10,735,935.00
Total	**28,376,392.00**	**18,489,626.00**

Source: Forestry Planning Agency (2004)

In order to guarantee forest areas, the government conducts demarcation of forest boundaries. It functions to formalize the forest areas conducted by delineating forest areas based on its functions. The delineation is formerly discussed by relevant parties namely relevant departments, provincial and local governments, forestry agencies, etc followed by definitive boundaries. Ministry of Forestry reported that up to 2004, it had been demarcated forest areas accounted for 220,859.08 Km or 78,35 % of total target boundary line based on Forest Land Use Consensus *TGHK (281,873 Km)*

3.3 SUPPLY AND DEMAND OF FOREST TIMBERS

Mostly the extraction of timber forest is conducted in order to fulfil the need for raw material of forestry industries. There was a policy that was required for concessionaires to have forestry industries by themselves or making cooperation scheme in order to ensure the continuation process of timber forest product. This policy was intended to promote added value of forest product and employment which became the main goal of economic growth as argued by Mathews (2002) where Indonesian Government since 1960s until 1998 (before Decentralization era) tended to utilize forestry sector both through forest concession and forestry industries to improve the Indonesia economic condition. As consequences, these installed industrial capacity needed to be fulfilled by sufficient timber supplies.

Mathews (2002) stated that the number of plywood mills which initially in 1979 accounted for 21 increased to become 101 in 1985 with the increase of production from 624.000 m3 to 4.9 million m3 in 1985 and became 10 million m3 in 1993. There was a trend in which from 1980s the number of forestry industries grew rapidly. The figure of timber forest production and export can be illustrated on the following figure 3.1 and 3.2 in 1961- 1999.

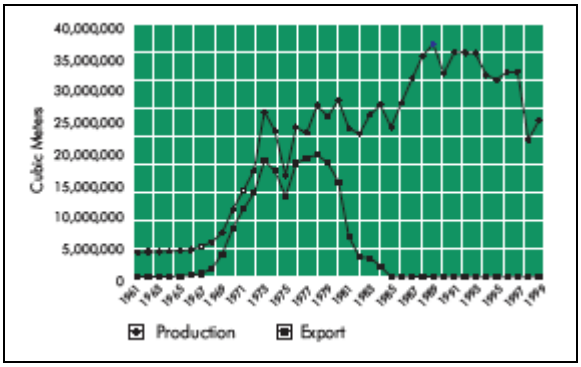

Figure 3.1 The Production of Export of Logs
Source: The State of the Forest: Indonesia (Mathews, 2001)

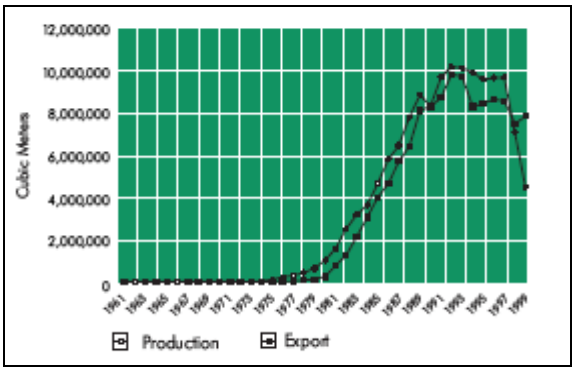

Figure 3.2 Production and Export of Plywood
Source: The State of the Forest: Indonesia (Mathews, 2001)

By province there was peak of timber extraction just after the enactment of Law No. 22/1999 and No. 25/1999 which accounted for 20 millions m3 resulted from Sumatera, Kalimantan and Irian Jaya. Several provinces were benefiting for abundant of forest resources related to decentralized forest resource administration

such as Riau, Sumatera Utara, West Kalimantan, Centre Kalimantan, East Kalimantan, Papua and Irian Jaya Barat It was accounted in 1999/2000 which produced timber around 500 – 4.000.000 m3. The extent of timber province by province can be illustrated on table 3.3.

Table 3.3The Extent of Timber Production by Province during the Last Seven Years

No	Province	Year (m3)						
		1998/1999	1999/2000	2000	2001	2002	2003	2004
1	Nangroe Aceh Darussalam	841121,41	83528,27	34799,78	38345,95	-	-	27179
2	Sumatera Utara	1295045,91	1452246,99	732487,79	750497,22	355168,39	975325	1244095
3	Sumatera Barat	280354,69	341616,23	28811,41	8762,85	186182,08	94703	44549
4	Riau	1307654,42	4882514,29	2258162,95	1410858,45	2058535,32	2300834	3471411
5	Jambi	482079,81	1551598,48	724005,04	2036250,44	123153,1	19734	873480
6	Sumatera Selatan	285911,77	436082,57	1979720,36	1866037,21	1151320,94	2224063	1840046
7	Bangka Belitung	-	-	-	-	-	-	-
8	Bengkulu	29513,63	48860,33	14556,21	-	-	6428	1436
9	Lampung	9313,03	9975,49	27499,57	-	-	68135	102459
10	DKI Jakarta	-	-	-	-	-	-	-
11	Jawa Barat	-	-	-	354921	190385	133031	222826
12	Banten	-	-	-	-	-	-	-
13	Jawa Tengah	-	14841,07	-	467560	655627	337146	348579
14	D.I. Yogyakarta	-	-	130988,28	-	-	-	-
15	Jawa Timur	-	402941,81	-	632922	713014	506629	352227
16	Bali	510,57	1486,19	33,65	-	-	-	560
17	Nusa Tenggara Barat	51003,32	8264,68	58429,05	47441,22	10594,17	8994	245
18	Nusa Tenggara Timur	255,58	520,13	-	-	-	-	12

19	Kalimantan Barat	1388025,19	1033885,87	244477,46	120901,42	88628,03	174828	388330
20	Kalimantan Tengah	4214512,26	4198989,72	1281431,65	593498,6	602676,05	1594811	1096635
21	Kalimantan Selatan	351108,87	298048,12	236198,11	52524,1	117734,31	269098	272680
22	Kalimantan Timur	3885875,78	1402650,2	3359019,5	970054,01	1061589,49	1721605	2150259
23	Sulawesi Utara	107252,12	71909	51514,21	26945,12	7038,9	8766	5576
24	Gorontalo	-	-	-	-	2825,81	-	-
25	Sulawesi Tengah	184338,47	316867,18	139219,1	58318,15	91923,09	88564	22416
26	Sulawesi Selatan	166806,73	339080,64	159560,86	93387,88	47100,8	39938	33135
27	Sulawesi Tenggara	189525,08	85186,13	5425,89	-	-	-	-
28	Maluku	448067,87	255531,74	81223,85	-	52168,94	49954	118161
29	Maluku Utara	-	-	-	-	12065,91	63715	201314
30	Papua	1500985,02	1492603,77	739674,49	522275,26	612571,77	737201	373859
31	Irian Jaya Barat	2027682,19	1890900,78	1511000,84	1455403	1559026	-	356437
	Total	**19.046.943,72**	**20.620.129,68**	**13.798.240,05**	**11.506.903,88**	**9.699.329,10**	**11.423.502,00**	**13.547.906,00**

Source: Statistic Data of Ministry of Forestry

Furthermore, Mathews (2002) explained that in 1995 there were about 585 concessions covering 63 million ha (one third of Indonesia's land total area) which in the mid of 1990s many concessions were withdrawing so it became about 464 concessions covering 52 millions due to violations toward concessionaires and declining of timber price.

However, the decrease of number of concessions do not decrease the level of timber production because some forest area which were previously operated by private concessions, with the total of 100 concession, were replaced by Inhutani I-IV[13] accounted for 14 million ha or joint venture between Inhutani and private companies accounted for 8 million ha and there were also conversion of forest areas with the total accounted for 8 million ha. These companies are still producing timber harvested from natural forest concessions. By the mid of 1998 only 39 million ha were operated by private companies.

Besides, the distribution of concession which initially was concentrated in Sumatera and Kalimantan Island was shifted to Eastern Indonesian Island which was considered still abundant of forest resources such as Irian Jaya. There is trend of the number of forest concession declining on Sumatera and Kalimantan Island and increasing in Irian Jaya.

In general, there is declining of level of concession activities within the two islands namely Sumatera and Kalimantan which were shifted to eastern Indonesia namely Irian Jaya. This shift had significantly appeared since 1998. This is closely related to less exploited forests in the eastern part of Indonesia especially Irian Jaya compared to western part such as Sumatera and Kalimantan. In mid of 2000, the Ministry of Forestry reported that there were 387 concessions which were in active operation out of 500 licensed concessions covering forest area accounted

[13] Inhutani is state owned company on forest concessions of both natural forest concession and plantation forest concessions. It consists of five companies namely Inhutani I, Inhutani II, Inhutani III, Inhutani IV, and Inhutani V operating on several main islands such as Sumatera, Kalimantan, etc. These companies replace the withdrawal private companies on forest concessions.

for 55 million ha. The shift of forest utilization activities based on Forestry statistic of concessions in the main island of Indonesia can be illustrated on figure 3.3.

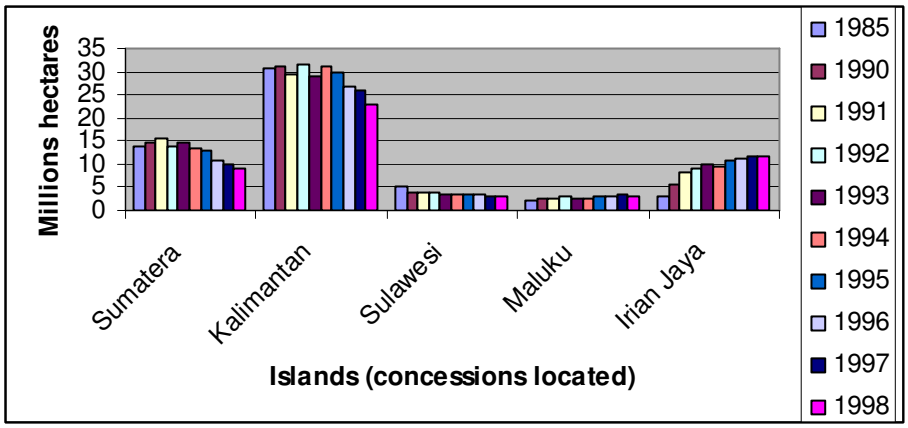

Figure 3.3 The Concession Area in Major Islands, 1995-1998
Source: The State of the Forest: Indonesia (Mathews, 2001)

Furthermore in 2000 the government still established new concession especially in Sumatera, Central and East Kalimantan and Irian Jaya. These increase the level of forestry activities. Mathews (2002) stated that in January 2001 the Ministry of Forestry established 11 new concessions over forest area accounted for 599,000 ha. For examples there were the new concessions established in Riau Province accounted for 45,000 Ha for pulp plantation and 175,000 Ha in Irian Jaya.

Based on the illustration above Indonesia is considered as the country which promoted aggressively the growth of forestry sector through timber production and forestry industries but lack of consideration on the sustainability of forest resources on supply side of timber. There was increase significantly of timber production during the time. Mathews (2002) stated that annual timber production has increased from 11 million m3 in 1970s to 36 million m3 in 1990s. This was followed by the increased number of wood processing as consequences of Government policies to improve the Forestry sector by requiring the concessionaires to conduct or to joint venture with wood processing companies in order to improve added values of forest products. Therefore in 1980s and 1990s

Indonesia became the main plywood exporter in the world, although it declined in 1997 due to economic crisis. However this rapid increase of timber demand was unsupported by legal timber production which tend to decline. It was estimated by Mathews (2002) that the demand of timber for industries has exceeded its supplies by 32.6 millions m3. The industrial timber production noted on industries and timber supplies can be illustrated on the following figure and table.

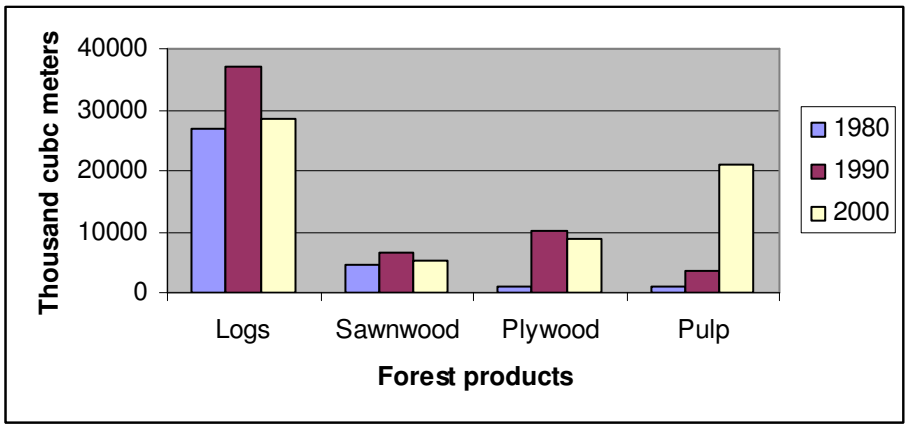

Figure 3.4 The industrial round wood productions
Source: The State of the Forest: Indonesia, Mathews 2001

Table 3.4 Timber Supplies form All Legal Sources (m3)

Source of Production	1995	1996	1997	1998	1999	2000
Production forests	17,012,949	15,595,766	16,224,228	11,867,274	8,599,105	7,661,219
Conversion forests	5,845,475	7,232,482	9,524,572	7,249,878	6,239,278	4,643,993
Community forests	149,023	603,151	1,213,928	719,074	957,056	232,134
State timber plantation (Perhutani)	1,795,630	1,911,757	1,604,034	1,718,561	1,890,900	897,615
Industrial Plantation Timber Concession	514,692	474,268	425,893	480,210	4,844,493	3,779,828
Total	**25,317,769**	**25,817,426**	**28,992,654**	**22,034,997**	**22,530,833**	**17,214,789**

Source: The State of the Forest: Indonesia (Mathews, 2001)

In 1980 Indonesian forest also was required to supply pulp and paper industries with much more timber supplies. There were cases in which domestic supply hardly support such demand as Mathews (2002) stated that since 2000 the demand for pulp and paper raw materials had been supplemented by imported raw material accounted for 3 millions m3 (round timber equivalent).

The rapid growth investment of forest industries such as plywood, pulp and paper processing passed the performance of planted forest development which was considered only contributing 5 percent of timber demand. Therefore, timber supplies are still dominantly sourced from natural forests. Mathews (2002) stated that a total timber demand in Indonesia is estimated at 76-80 million m3 (see Figure 6) which was inadequately supported by static and declining of timber supplies (see Table 4). Indonesian forestry sector is suffered from the imbalance of supply and demand of timber which Mathews (2002) stated that the shortfall of demand is fulfilled by illegal sources. Brown,1999;49 in Mathews (2002) stated that research conducted in 1998 illustrated that the gap between legal supply and production capacity was accounted for, at least, 21 millions which many parties believed that the there was possibility for more that was estimated. Mathews (2002) argued that in 1997-1998 it was found that timber consumption exceeded supply by 32.6 millions m3 where considered that, within 1997-1998, illegal logging was portioned as more than half of total domestic production. Even the latest study in 2000 approximated that illegal logging was accounted for 65 percent of timber supply with the total demand of timber in 2000 on industrial capacity was 74-80 millions m3, exceeding 35-40 million m3 of timber supplies. There is limited data available for industrial capacity. However as illustration in 1999 the official installed the capacity of wood processing which can be described on the following Figure 3.5.

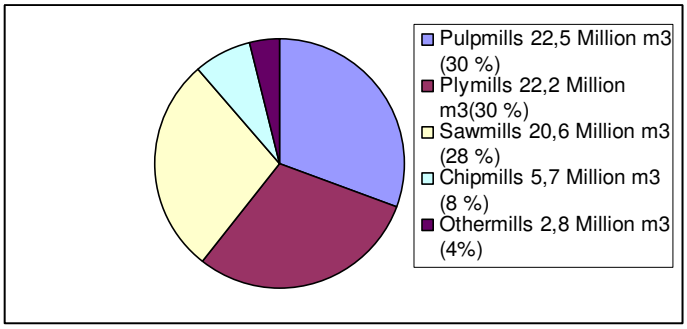

Figure 3.5Installed capacity of wood processing in 1999
Source: The State of the Forest: Indonesia (Mathews, 2001)

3.4 LOGGING CONCESSIONS

Within the area and status of concession, there is difficulty to identify and control activities within forest areas covered by concessions. It is caused by insufficient control over forest concession within regional authorities which are mainly based on formal status and regular reports. Mathews (2002) stated that there are some concessions which are officially inactive but in fact they are in operation. This results in the uncertainty of concession status and level of timber forest production. Furthermore, Mathews (2002) stated that in July 2000 there were 288 concessions which had already expired license accounting for 30 millions hectares but had not been returned to the government control. It can be illustrated on table 3.5 as below:

Table 3.5 Logging Concession Status and Area, Reported in 2000

Logging Concession Status	Number of Units	Area (Ha)
20-Year Concession Grant Still Operation	293	33,950,000
20-Year Concession Grant Expired	288	29,980,000
Expired Concession Formally Returned to Status Control	71	5,470.000
Total	**652**	**69,400,000**

Source: The State of the Forest: Indonesia (Mathews, 2001)

The scheme of concessions[14] applied is also considered as insufficiently ensuring the concessionaires to get permit for the next period of concessions resulting in uncertainty in investment. Furthermore it is calculated that 35 years is considered as insufficient to conduct activities from plantation until harvesting for all concession areas (Christanty, 2004).

Within the context of silviculture system implementation, while the concession holders are required to implement the silviculture system which limited the number of timber extraction level, in some municipalities enacted Small Scale Concession[15] with lack of control of its implementation such as operation requirements and timber uses[16]. There is experience that the implementation of this permit is still based on the recommendation of DPRD[17] while draft of Regional Regulation or ***Peraturan Daerah (Perda)*** was still on discussion in Legislative (Simarmata, 2000).

The concessionaires also suffer from the lack of establishment of their concessions due to the enactment of Small Scale Concessions where actually all the forest areas, especially lowland forest, have already been divided into concessions during the enactment of Law No. 5/1967 which implies that this practices are overlapping with the existing concessions, buffer zones, and conservation areas (Simarmata, 2000). It clearly indicates that economic profit is the most prominent purpose as stated by Sumarmata (2000) that the sole purpose is to extract maximum profit in the shortest possible time. Another problem is the

[14] Concession is provide the rights for concessionaires to exploit timber within certain period of time (35 year) determined by the government. To prolong their concessionaire requires an assessment for good silviculture performance of previous concessionaire right.

[15] Small Scale Concession is concession for right of timber extraction which cover forest areas of 100 hectares conducted by local community by using traditional equipment and for fulfilling local needs of timbers.

[16] HPHH of 100 hectares is purposed for local community to conduct forest utilization conducted by using traditional equipment of harvesting and for local timber need. Unfortunately this scheme was implemented by using heavy equipment, usually conducted by concessionaires, and timbers were sold to forestry industries such as Municipality of Kapuas Hulu of West Kalimantan (Mc Carthy, 2001).

[17] DPRD is the house of representative which refers to regional and local authorities. In this case it refres to municipal house of representative

inadequacy of the survey held and suitability of area before the issuing of the permit. Sometimes, there are problems with accuracy of forest potency, boundary area, and lack of coordination between three levels of government (Anzari et al, 2005) which potentially overlap among existing concessions and/or application of concession agreed. Furthermore it has risks for concession approval located on conservation or protection forest area.

3.5 FOREST CONDITIONS

Arnold (2006) reported that based on remote sensing applied by Ministry of Forestry in 2002 forest covering in Indonesia is about 120 hectares of forest areas which consist of natural forests and plantation forests. Furthermore it was reported that this amount is considered as rough calculation because there are some forests areas which are non forests covering estimated about 33 millions hectares, while on other forest areas, there are no data available. However, based on official report by Forestry Planning Agency in 2004 based on the same year, it was reported that Indonesian forests covering accounted for 187.91 millions hectares consisting of:

- Forest : 93.92 millions hectares (50%)
- Non forest : 83.26 million hectares (44 %)
- Data not available : 10.73 million hectares (6 %)

Within the forest areas there are accounted for 133.57 millions hectares of forest covering consisting of:

- Forest : 85.96 million hectares (64 %0
- Non Forest : 39.09 million hectares (29 %)
- Data not available : 8.52 million hectares (7 %)

The detailed forest covering can be illustrated on table 3.6.

Table 3.6 Forest Covering in 2002

Tutupan Lahan	Forest Areas								Non Forest Purposes		Total	
	Permanent Forest (.000 Ha)					Conversion Forest (.000 Ha)	Total (.000 Ha)	%	Total (.000 Ha)	%	Total (.000 Ha)	%
	Protection Forest	Conservation Forest	Production Forest	Limited Forest Production	Total							
Forest	22,101.71	14,365.04	20,624.33	18,180.19	75,271	10.693	85,964	64	7,960	15	93.924	50
Non Forest	5,622.04	4,008.69	12,639.11	5,764.80	28,035	11,057	39,092	29	44,164	81	83,255	44
No Data	2,327.79	1,502.32	1,995.21	1,711.08	7,536	981	8,518	7	2,216	4	10,734	6
Total	30,051.54	19,876.06	35,258.66	25.656.06	110.842	22.731	133.574	100	54.340	100	187.913	100

Source: Department of Forestry (2006)

There is a common image in natural forest concession practices where the companies implement insufficient silviculture selective cutting system. The companies tend to conduct part of it or to neglect its implementation. This result in bad condition of forest stands and degraded forest. This is worsening by external factors that disturb the forest stand and concession area such as occupation by communities, illegal logging, overlapping area with village areas and costume forest. Mathews (2002) stated that in 2000, the Ministry of Forestry reported that most forests of concessions were in bad condition. There are not only external causes that are responsible for degraded forest condition such as occupation of forest area, illegal logging etc, but also internal factor which refers to concessionaires that violate the implementation of selective cutting system through neglecting or partially implementing this silviculture system. Furthermore, Mathews (2001) reported that 47 millions ha of forest land of both active and expired concession were degraded accounting for 30 % with only leaving over 40 % considered in good condition. The forest condition can be illustrated on table 3.7 as the following:

Table 3.7 Forest condition in 432 current and expired logging concessions

Forest Condition	**Concession Areas (320 Units)**		**Expired Concessions Managed by State Forestry Corporation (Inhutani IV) (112 Units)**		**Total**	
	Ha	**%**	**Ha**	**%**	**Ha**	**%**
Primary forests	18.300.000	45	600.000	11	18.900.000	41
Logged forest (good-moderate condition	11.100.000	27	2.500.000	44	13.600.000	29
Degraded forest, scrub and agriculture	11.600.000	28	2.600.000	45	14.200.000	30
Total	41.000.000	100	5.700.000	100	46.700.000	100

Source: The State of the Forest: Indonesia (Mathews, 2001)

There were some cases where government abstracting concession operation due to pressures from NGOs and communities with various reasons such as species conservation, overlapping area with village administration or custom forest etc, because Mathews (2002) gave examples of concessions whose licences were pulled because the Government resigns the operation of the Medan Remaja Timber company on forest area accounted for 39,300 ha in Aceh Province due to report from NGOs for bad performance.

Mathews (2002) stated that in mid of 1990, the numbers of concession have decreased resulting in the declining of formal timber supply. Furthermore the rest of forest areas beyond the concessions are either degraded or at risk of forest degradation process.

3.6 DEVELOPMENT OF PLANTATION FOREST

In order to support the needs for timber demands of forestry industries, the Government issued a policy to develop plantation forest by planting fast-growing species through concession mechanism namely Industrial Plantation Forest Concession (Hutan Tanaman Industri-HTI). The program was enacted by Government Regulations in 1990s which aimed to support timber demand on natural forests and to improve the productivity of permanent productive forest areas. This program received responses from entrepreneur to establish plantation forest concession due to incentive offered by the government in the financial loan with no interest through Reforestation Fund or ***Dana Reboisasi (DR)*** collected from production fee of natural forest exploitations. Officially, there are three types of plantation forest concessions established, namely pulp industrial plantation forest, industrial plantation forest and transmigration industrial plantation forest.

According to Mathews (2002), Forestry Department reported officially that there has been at least 7.9 million ha of forest areas are under these allocations since 2000, which only 23.5 percent of that areas had been planted (see table 3.8) and in

2001 the forest areas allocated for plantation forest concession had been increased reaching 8.8 millions hectares but no data available for planted forest areas. Furthermore, Mathews (2002) illustrated that about 2 million ha of forest areas are allocated for industrial plantation forest and transmigration industrial plantation forest had been planted only on fifth, while 5 million ha allocated for pulp plantation forest had been reached only 37 percent.

Table 3.8 The Extent of Plantation Forest Concession by Province in 2000

Province	Forest Area Allocated (Ha)	Forest Areas Planted (Ha)	Percentage of Areas Planted (%)	Number of Companies
HTI-Pulp				
Aceh	207899	55290	26,6	2
North Sumatera	412060	59428	14,4	2
Jambi	78240	86918	111,1	1
Riau	550190	289280	52,6	3
South Sumatera	340100	222334	65,4	2
South Kalimantan	268585	86259	32,1	1
East Kalimantan	793237	325517	41,0	5
Central Kalimantan	185511	0	0,0	2
West Kalimantan	735306	42785	5,8	5
Irian Jaya	1389200	0	0,0	6
Total	**4960328**	**1167811**	23,5	**29**
HTI-Sawnwood				
Aceh	6050	0	0,0	1
North Sumatera	176893	26778	15,1	7
Jambi	154030	20481	13,3	6
Riau	257888	52843	20,5	12
South Sumatera	58130	3623	6,2	3
Lampung	175152	57125	32,6	7
NTT	55074	5945	10,8	2
South Kalimantan	77575	26608	34,3	5
East Kalimantan	439719	105020	23,9	12
West Kalimantan	152780	45497	29,8	3
Central	79000	5000	6,3	6

Province	Forest Area Allocated (Ha)	Forest Areas Planted (Ha)	Percentage of Areas Planted (%)	Number of Companies
Kalimantan				
South Sulawesi	57000	4910	8,6	3
Central Sulawesi	80101	5532	6,9	3
Southeast Sulawesi	72845	5942	8,2	2
Maluku	24851	8843	35,6	3
Irian Jaya	198000	0	0,0	4
Total	**2065088**	**374147**	**18,1**	**79**
HTI-Trans				
Aceh	32064	12158	37,9	5
North Sumatera	6200	3856	62,2	1
West Sumatera	6675	2354	35,3	1
Riau	83190	41124	49,4	6
Jambi	34835	14712	42,2	4
South Sumatera	21000	3625	17,3	1
West Kalimantan	217930	33689	15,5	13
Central Kalimantan	132495	61625	46,5	13
East Kalimantan	183989	75934	41,3	14
South Kalimantan	41040	20943	51,0	4
South Sulawesi	13300	3930	29,5	1
Central Sulawesi	13400	8742	65,2	1
Maluku	49717	26515	53,3	3
Total	**835835**	**309207**	**37,0**	**67**
Grand Total	**7861251**	**1851165**	**23,5**	**175**

Source: The State of the Forest: Indonesia (Mathews, 2001), and Ministry of Forestry Report

The efforts to improve the non-productive forest areas through establishment of industrial plantation forest, which formally is located on non-productive forest areas, have been insufficiently successful due to some practices with 2.2 percent of concession developments were located on the productive areas or under logging concessions. Mathews (2002) illustrated that in average of 72 percent of total industrial plantation forest concessions consisted of natural forests. The reasons

for such practices are both that of conducting plantation on truly degraded forests which required more cost for land clearing and soil fertility and gaining wood utilization permits as additional income for license holder which mainly belong to concessionaires. This leads to increase of the natural forest conversion for plantation forest concessions which Mathews (2002) stated that in 1998 at least it has reached 2.7 million ha of natural forest concessions. It can be illustrated on table 3.9 below:

Table 3.9 Natural forest concession areas (NFC) converted to Plantation forest concessions in 1998 by provinces

Province	Natural forest concession areas converted (Ha)
Aceh	133.010
Jambi	168.648
Riau	534.094
West Sumatera	3.847
South Sumatera	113.251
North Sumatera	120.234
Total of Sumatera Island	**1.073.084**
West Kalimantan	486.827
South Kalimantan	194.513
Central Kalimantan	286.255
East Kalimantan	614.913
Total of Kalimantan Island	**1.582.508**
South Sulawesi	16.963
Maluku	68.551
Irian Jaya	14.945
Total	**2.756.051**

Source: The State of the Forest: Indonesia (Mathews, 2001)

There are studies which stated that the gaining subsidies through reforestation fund and rights for forest stands utilization are considered as more pull factor for establishment of plantation forest concession than the efforts to development planted forest stands to supply forestry industries.

3.7 PALM OIL AND AGRICULTURAL INDUSTRIAL ESTATE CROPS

Related to land covering there are some agricultural activities that require large scale of lands. Among others, oil plantation is considered as significantly competitive over land uses with forest areas. Mathews (2002) stated that oil plantation is distributed on some main islands such as Sumatera, Kalimantan, Sulawesi and Irian Jaya which between 1967 and 2000 had grown from less than 200.000 ha to become more than 3 million ha It can be described on figure 3.6.

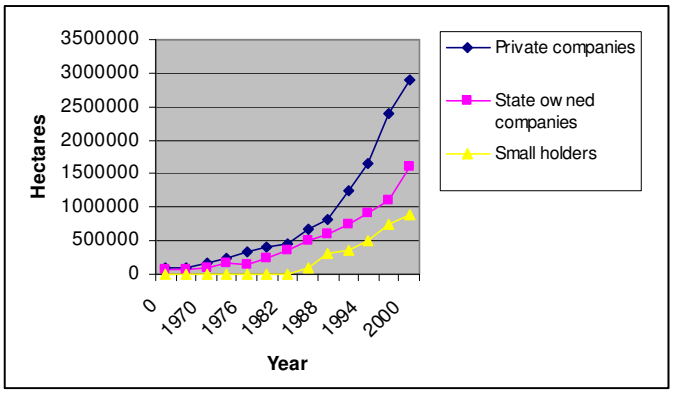

Figure 3.6 The Growth of Palm Oil Areas
Source: The State of the Forest: Indonesia (Mathews, 2001)

The fascination of oil plantation compared to other agricultural estates plantation including plantation forest is caused by relatively low investment to establish oil plantation with higher oil production, compared to other oil crops, and can be harvested within relatively short time. Therefore, the investment on palm oil plantation is more attractive than plantation forest development. This rapid growth of palm oil plantation is supported by government incentives and World Bank supports in terms of credit and area provision which enable private developers to prepare the land, transfer land to small farmers, supervise operation and purchase the crops. Mathews (2002) stated that within 1967 and 2000 the total areas of oil palm plantation in Indonesia in 2001 had reached 32 percent of palm oil global production of 21.8 million tons accounted for 7 million tons.

Palm oil plantation is considered as the main factor of deforestation through forest conversion due to both the attractiveness of investment caused by government incentives and relatively quick crops through conversion of forest areas. Mathews (2001) stated that inadequacy of timber supplies from natural resources for forest industries have been stimulating timber sourced from conversion forest areas for palm oil plantation on natural forest concession through IPK[18] which mainly belong to the same owners. License holders for palm oil plantation development are doubled benefit by also getting timber utilization permits of relatively still productive forest areas. Casson (2001) stated that in 1999 about 4.5 million ha of conversion forest areas have been approved. Furthermore Mathews (2001) reported that unpublished Ministry of Forestry data determined the increasing permanent forest conversion of about 14 million ha. This conversion is encouraged due to most palm oil plantation applications which are the forest concessionaires. Casson (2000) reported that between 1982 and 1999 it had reached 4.1 million ha.

3.8 FOREST RESOURCES FOR REGIONAL REVENUES

Decentralization is considered by regional government as transfer of administrative authorities from the central government to regional government either provincial or municipal governments. It has become an opportunity for regional authorities to control and to gain regional benefit over natural resources[19] which are formerly considered as under control of central government.

Among other natural resources namely coal deposits, oil etc, forests have been utilized more intensively in some regions known to have abundant natural forest resources. In conducting forest utilization, there is trends of changes in forest

[18] IPK is abbreviation from Ijin Pemanfaatan Kayu or "Right for Timber Extractions" on forest areas, usually on natural forest areas, purposed to develop crops such as palm oil.

[19] Casson (2001) reported official statement of head of Kotawaringin Timur which Law No. 22/1999 and 25/1999 as opportunities to the region to create regulation and to use natural resources and income to conduct development.

management which are characterized by changing from applying the natural process of forest ecosystem toward economic interest of forest resources.

Initially, forest utilization was held by considering the increment of the forest type as factor defining the level and time schedule of exploitation. The exploitation is held based on the limit of increment of forest growth which secures the basic forest resource in order to maintain the remaining quality and quantity. Therefore, concession is required for minimum large area to achieve sustainability of production by defining compartment systems, cycling of production, and minimum diameter.

Regional authorities respond to decentralization by issuing regional regulations or *peraturan daerah* aimed to define autonomous administrative structure and to establish more direct control over forest resources. For example Berau Municipality in East Kalimantan has issued at least 11 regional regulations[20] on forest resources which mainly regulate forest product harvest concessions (FPHC) or *Hak Pemungutan Hasil Hutan (HPHH)* related to its allocation, logging permits, land use and land clearing permits both on state forests and custom forests which also require contribution of third party to local authorities over timber and sawn timber and forest products.

Three main reasons which contribute to establishment of forest product harvest concession (Casson, 2001; Barr, 2001) are:

- To generate regional income by securing a larger portion of reforestation fund (dana reboisasi) and forest resource rent provision (PSDH);
- FPHC is believed to provide timber entrepreneur accesses to custom forests;
- Enabling local people for greater share of benefit from forest

Securing local revenues are collected by monitoring the realization of fees distributed to regional government, for example is Malinau Municipality, in

[20] As reported by Casson (2001) that in 2000 Kotawaringin has established 43 regulations to promote regional autonomy and other 10 regulation was in process of ratification with regulation no. 14 and 20 specifically related to forestry sector.

accordance with formal relevant regulation such as Forest Resources Rent Provision (PSDH) and negotiating with central government for more portion, conducted by Provincial Government of East Kalimantan, of Reforestation Fund proposed for 80 % and FRRP for 20 paid directly to Provincial Government. In turn municipal governments were also asking for more balance considering the origin of timber produced. Furthermore there were also issuing new regulations expanding new fees for concessionaires related to local communities named compensation fee and to local government based on cubic of timber harvested.

In other regions, Forestry sector is determined as major prospective sector generating local income, for example, in Malinau Municipality including Forestry sector contributing to 15 % of total local revenues, by securing a larger portion of the fees and royalties paid by companies operating in their jurisdiction boundaries and issuing small-scale forest conversion licenses known as Timber Extraction of and Utilization Permit or *Izin Pemungutan dan Pemanfaatan Kayu (IPPK)*. The authorities imposed the new two fees on timber concession, namely, compensation fees required concessionaries to pay certain amount for timber harvested[21].

Regional authorities conduct regional policies by securing new sources of PAD over forest resources through collected taxes and fees in timber sector. For example Obidzinski (2003) stated that in Berau there are four sources[22] namely

- Third party contribution (*sumbangan pihak ketiga*) based on large of concession;

[21] In Malinau Municipality, the authorities imposed the new two fees on timber concession namely compensation fees required concessionaries to pay Rp. 20.000,- per m3 for local communities and Rp. 50.000,- per m3 for government.

[22] In Berau the authority gain of revenues are sourced from :

- Third party contribution (*sumbangan pihak ketiga*) requiring timber permits holders to pay Rp. 200.000,- per hectare;
- Production fee (*retribusi produksi*) requiring concessionaires to pay Rp. 2.300,- per m3 for logs cut;
- Production fee (*retribusi produksi*) requiring timber permits to pay Rp. 10.000,- per m3 for logs cut and Rp. 5000,- per m3 for pulp wood harvested ;
- Processing fee (*retribusi pengolahan*) of Rp. 10.000,- per m3 for processed timber products.

- Production fee (*retribusi produksi*) based on timber harvested;
- Production fee (*retribusi produksi*) based on cubic timber harvested;
- Processing fee (*retribusi pengolahan*) based on timber product processed.

These fees collected were significantly generating regional income which in 2002 has experienced to reach Rp. 8 billion. Overall regional revenue as Obidzinski (2003) reported that between 1998-1999 and 2002 there was the increase of 1000 % from Rp. 1.8 billion to Rp. 18.6 billion.

Tax revenues, in forestry sector, are resulted from Forest Resource Rent Provision (FRRP) or *Provisi Sumber Daya Hutan* based on volume and species royalty of timber harvested and Reforestration Fund (RF) or *Dana Reboisasi* based on volume fee of timber harvested. Within Law 25/1999 regional governments receive more portions of revenues related to natural resources. For example, Obidzinski (2003) reported that Berau has experienced the budget increase from FRRP from only Rp. 6 billion in 1998/1999 to become Rp. 155 billion in 2001. Furthermore Berau also experienced the increased revenue after having heated negotiation with central government from RF from only 40 % to become 80 % which are paid directly to the province. However this practices are conducted case by case meaning that only the succeesful negotiation will result in satisfied sharing revenues for regional governments.

Casson (2001) reported that, Kotawaringin Timur issued controversial regional regulation namely *Perda No, 14* within May to June of 2000 which is considered as to legitimize illegal logging which has the ability to generate income accounted for Rp. 24 billion (US $ 2.4 million).

There were also experiences of negotiation between municipal government with central government over sharing of tax revenues of natural resources as stated on Law No. 25/1999 namely authorities of Berau, Kutai Barat, Kutai Timur etc which was formerly considered as hardly possible. Obidzinski (2003) argued that

this was occurred due to highly centralized fiscal system in which the central government tends to maintain prior to decentralization. Moreover Obidzinski (2003) reported that negotiation over forest resources was also experienced between region boundaries in order to ensure that they received share of forest rents deriving from timber harvested.

The very extraordinary regional government efforts to improve their revenues are the issuance of small scale concessions as response to Law No. 41/1999 characterized by increased number of timber permits in most every region. Casson (2001) reported, for example, that Kutai Barat experienced in 2000 to allocate 223 licenses covering 22.300 hectares within slightly more than one year, while Simarmata (2000) reported that Bulungan issued more than 3000 permits. This policy is considered to provide benefit to local communities by giving access for local communities toward forest resources and to gain benefit from timber extraction. This policy requires using traditional equipment for timber extraction within 100 hectare of compartment. In practice, local entrepreneur and concessionaires are conducting timber extraction, while local communities receives timber extraction fee as Casson (2001) reported in his field study it was accounted between Rp. 25.000,- to Rp. 15.000,- per m3 for felled timber. However this has contributed generating regional revenue accounted for US $ 37.300.

3.9 FOREST CONVERSTION AND THREATS ON FORESTS

Threats of forest, in general, are classified into two main processes upon forest namely deforestation and degradation. Degradation refers to declining of forest stands both quality and quantity experiencing its natural ecosystem and function (Wikipedia encyclopaedia, July 2006). Further worse process will result in deforestation, based on Wikipedia encyclopaedia, July 2006, which refers to process toward removal of trees as main characteristic of forest resulting in non-forested areas.

Basically, in terms of forest utilization, threats on forest can be divided into two components, namely, the forest stands and the forest area; although in practice, the extinction of one aspect can significantly affect the other component. There are also threats on forest which affect the degradation of forest in terms of both forest land and forest stands at the same time. It is related to the unity of forest as an integrated ecosystem which can not be separated in terms of maintaining its functions although there is tolerance level in which forest ecosystem could recover toward the climax forest. However, since external effects exceeding the tolerance changes on forest ecosystem will result in the ecosystem disabilities to recover which later will result in forest degradation.

In Indonesia context, there are main threats on forest resulting in forest degradation which are mainly due to inadequacy of silviculture system implementation and illegal logging. In order to extract timbers from natural forest concession, concessionaires are required to conduct selective cutting. However there were many studies which reported that most natural forests are suffered from inadequacy of selective cutting implementation. Mathews (2001) reported that nearly 30 percent of concessions are in degraded condition, while some literatures stated that Indonesian forests has experienced rate of deforestation which estimated about 1.5 – 2.5 million hectares per year (Pramono, 1991, Moniaga, 1993, Simon 2002).

Forest degradation is also possibly caused by the failure of reforestation program of permanent forest areas namely industrial plantation program. This program is aimed to improve productivity of forest areas and to support supply of timbers. In order to support this program the government gives incentives in term of reforestation fund with interest free loan. Mathews (2001) reported that about 9 millions hectares had been allocated for development of industrial plantation forest. However it was reported that about 2 millions hectares had been being planted. Moreover there were some cases where industrial plantation forests are

located on the formerly productive natural forest. Kartodihardjo et al (2000) stated that about 72 percent of plantation forest concessions were formerly natural forest and 22 percent of those areas were productive natural forests. These significantly affect degradation of forests due to the degraded forest quality and quantity.

The high demand of timbers to fulfil forestry industries, sawn timbers processes and pulp and paper processes, is responsible for pressure on natural forest due to limited sources of timber from plantation forests. Natural forests suffer from over exploitation conducted both by legal and illegal timber exploitation permits which is considered to violate the implementation of suitable selective cutting. So far Indonesia never experienced timber imports and hardly ever experienced raw materials for pulp industries. Moreover, the higher industrial capacity determining demand of timbers than potential timber supply is complicating supply and demand mechanism of forest timbers. This leads to massive practices of illegal logging as Mathews (2001) stated that it has reached 50–70 percents of wood supplies. This is supported by statement officially by the Ministry of Forestry where illegal cutting occurred in concession areas, unallocated forest areas, expired concessions, conversion forest areas, and conservation and protection forest areas. This is worsening by more intensive illegal logging activities on the conservation and protection forest due to the better potency of these areas than other forest functions. Official statement of Ministry of Forestry stated that illegal logging has degraded forest in about 10 millions hectares of Indonesia forests.

Deforestation on forest is mainly due to some causes, namely, illegal forest conversion, forest occupation, encroachment, deliberated forest fire, etc. In general, degradation of forest occurred due to efforts to use forest areas for other purposes or claims on forest areas. Other possible causes are natural processes such as forest fires, pests, diseases, etc.

In Indonesian context, main deforestation of forests occurred due to disturbances on forest areas to develop palm oil estates and forest fires. However, there are

hardly ever cases of deforestation caused by pests and diseases. The relatively low investment and short-timer period for harvesting, 5 years and afterwards for palm oil compared to plantation forest needed for at least 8 years, of palm oil estate developments become the attractiveness of such development. Palm oil developments required large amount of lands which are mostly covered by forest on regions which lead to the needs for forest areas for conversion as Mathews (2001) stated that it had reached approval of 7 million hectares and illegal occupancy on permanent forest areas. However, there is no exact calculation of such illegal occupancy yet.

Controversial deforestation forests which significantly become concern of NGOs against forestry institutions are traditional shifting agricultures. It is caused by traditional agriculture practices of indigenous communities to open forest covers in order to plant crops which shift from one spot to another spot in permanent cycle. Although there is no exact data about shifting agriculture activities on forest areas Mathews (2001) estimated that it responsible for about 20 percent of forest loss or around 4 millions hectares since 1985 to 1997. This practice is still occurred currently. While Cifor (2002) estimated that 12 millions of shifting cultivations contributed to 35 hectares of forest lands which around 100 million or peoples depended on forests.

Since 1993 Indonesian forests also suffer from deliberate forest fires on forest land especially in Sumatera and Kalimantan. Although, naturally, there were experience of natural forest fires due to extended drought and burnt charcoal deposits of low land in Kalimantan, recently there are increasing deliberate set of forest fires. This trend is worse by the change of climatic phenomenon and period occurrence of the El Nino (Mathews, 2001) setting massive forest fires over the last two decades. Mathews (2001) stated that during 1982-1983 in Kalimantan, there were forest fires which covered about 210.000 Km2 stimulated by vast accumulation waste on the forest resulted from logging practices, and fire prone ground vegetation. Furthermore, deliberate forest fires also occurred by that

period of time accounted for 3.2 million ha of the areas, the 2.7 millions of which are tropical rain forest.

While, by early 1998 about 10 million of forest areas had been on fire with damages accounted for nearly US $ 10 billions which covered 23 provinces of 27 provinces (all provinces prior to division of regions during decentralization era) resulting serious problems of health of about 20 millions of people such as inhales, ingests, respiratory diseases, etc (Mathews, 2001). The estimation of areas damaged by fire can be described on table 3.10 below:

Table 3.10Estimated Area Damaged by Fire in 1997-1998 (Ha)

No	Island	Estimated areas damaged by fire (Ha)							
		Mountain Forest	Lowland Forest	Peat and Swamp Forest	Dry Scrub and Grass	Timber Plantation	Agriculture	Estate Crops	Total
1	Kalimantan	-	2.375.000	750.000	375.000	116.000	2.829.000	55.000	6.500.000
2	Sumatera	-	383.000	308.000	263.000	72.000	669.000	60.000	1.755.000
3	Java	-	25.000	-	25.000	-	50.000	-	100.000
4	Sulawesi	-	200.000	-	-	-	199.000	1.000	400.000
5	Irian Jaya	100.000	300.000	400.000	100.000	-	97.000	3.000	1.000.000
	Total	**100.000**	**3.283.000**	**1.458.000**	**763.000**	**188.000**	**3.844.000**	**119.000**	**9.755.000**

Source: The State of the Forest: Indonesia (Mathews, 2001)

Deliberated forest fires are conducted in order to implement relatively cheap costs of land clearing both by local communities and private companies. Less guarded of forest lands are the most potential for illegal practices of land clearing by setting fire on forest stands in order to plant crops or to establish rubber estates or palm oil estates. While private companies are setting fire on felled timbers in order to plant palm oil plantations considered as cheaper than removing timbers from the desired planted areas.

There was the case in 1997 when haze had been flown to neighbouring countries namely Singapora and Malaysia which made neighbouring countries such as Malaysia, Australia, and the United States cope with forest fires. Mathews (2001) stated that in 1994 at least 5 millions hectares of forest were burned and other was cases occurred in 1997-1998 claiming about 4.6 million hectares. Besides, there are cases where fire set by natural process due to hot weather initiated by scrubby forest which occurred in Sumatera and Kalimantan.

However, there is trend of decreased numbers of hot spots in the last five years. This is at least related to government policies on several sectors namely “zero burning” by Ministry of Agriculture, Ministry of Transmigration and Settlement. While the Government Regulation No. 4/2001 requires that all levels of government should conduct prevention and control of forest and land fires. Ministry of Forestry has special agency named Directorate General for Forest Protection and Nature responsible for prevention and control of forest fires. The extent of forest fire by province can be illustrated on table 3.11.

Table 3.11 The Extent of Forest Fire by Province for the Last of Five Years

No	Province	Year (Hectares)				
		2000	**2001**	**2002**	**2003**	**2004**
1	Nangroe Aceh Darussalam	-	-	-	-	-
2	Sumatera Utara	-	168	-	0,5	586
3	Sumatera Barat	439	120	-	15	-
4	Riau	-	422,35	2211,85	7,5	-
5	Jambi	21	30	212	3025	138,4
6	Sumatera Selatan	-	7868,92	10983,53	233	953
7	Bangka Belitung	-	-	-	-	-
8	Bengkulu	-	-	-	-	-
9	Lampung	10	-	713,3	-	-
10	DKI Jakarta	-	-	-	-	-
11	Jawa Barat	-	77,5	301,09	26	90
12	Banten	-	-	-	-	-
13	Jawa Tengah	-	-	-	-	-
14	D.I. Yogyakarta	-	-	300	-	-
15	Jawa Timur	211,75	485,45	2089,89	161,95	1176,67
16	Bali	46,65	32,5	31,2	-	-
17	Nusa Tenggara Barat	104	170	361	28	-
18	Nusa Tenggara Timur	602,8	196,5	8265,92	43	13,62
19	Kalimantan Barat	646,8	1301,28	423,5	-	-
20	Kalimantan Tengah	-	614,5	-	-	-
21	Kalimantan Selatan	2	8	-	-	-
22	Kalimantan Timur	-	33	33,25	5,5	302
23	Sulawesi Utara	-	450	600	-	-
24	Gorontalo	-	-	-	-	-
25	Sulawesi Tengah	932,5	2230	900	-	-
26	Sulawesi Selatan	-	121,5	1305,25	-	84,3
27	Sulawesi Tenggara	-	-	140,95	-	-
28	Maluku	-	-	200	-	-
29	Maluku Utara	-	-	-	-	-
30	Papua	-	-	-	-	-
31	Irian Jaya Barat	-	-	-	-	-
		3.016,50	**14.329,50**	**29.072,73**	**3.545,45**	**3.343,99**

Source: Directorate General of Forest Protection and Nature Conservation, 2004

Mining activities are also responsible for forest degradation as reported on "Forest, people and rights" (2002) that in 2000 there was about 36 million of forests which had been degraded due to forest removal, infrastructure development, and pollutions.

3.10 SOCIAL ASPECTS OF FORESTS

Forests are closely related to rural areas which are characterized by limited infrastructure and services and poverty of its communities. Indonesian Statistic Centre Biro reported that, in 2000, within 200 millions of populations, there were about 60.7 percent who lived in rural areas 48 percent of which were making a living in agriculture and economical activities related closely to forests. Furthermore there were 29.3 percent that were involved in plantation forest concession, 23.3 percent in plantation estates, 16.7 percent worked for natural forest concession (Statistice centre biro,2000). Wollenberg and Cifor (2004) illustrated that most of rural communities outside Java live on the stated forest lands accounting for 48.8 millions of people, 10.2 millions of which are considered as impecunious. Furthermore, 20 millions of people around the forest consist of 6 millions of people considered as high dependence on forest for their living.

Officially there are two main government policies on social aspects of natural forest utilization, within Derectorate General for Forest Production, namely Community Development by Logging Concession (CD) or ***Pembinaan Masyarakat Desa Hutan (PMDH)*** and Natural Forest Management (NFM) by Traditional Communities/ Community Logging or ***Pengelolaan Hutan Alam oleh Masyarakat Traditional.*** Furthermore in plantation forest concession there is plantation system adopting ***Tumpang sari*** and scheme of ***HTI-Trans*** or Transmigration Industrial Plantation Concession.

Community development, in natural forest concession, is conducted by cooperation between company and village official in order to implement defined program. The company proposes and provides financial, technical and personal supports related to program under agreement of official authorities of villages. The programs conducted are related to physical, social and economic development such as road constructions, clinics, elementary schools, religious building,

agricultural development, etc. Budget allocated for the program is based on the result of consultation between concessionaires and the local authorities. The extent of Rural Forest Community Development by province can be described on table 3.12.

Table 3.12 Extent of Rural Forest Community Development by Province in the last seven years

No	Province	Year (x Rp. 1.000,-)						
		1998/1999	1999/2000	2000	2001	2002	2003	2004
1	Nangroe Aceh Darussalam	695348	743968	-	299103	299103	-	-
2	Sumatera Utara	392361	264712	208012	56144	300760	21651	208012
3	Sumatera Barat	198805	188041	383695	777344	-	64330	167240
4	Riau	1450394	1474847	703699	475829	564240	265485	89000
5	Jambi	315256	290641	189701	109545	187106	180988	189701
6	Sumatera Selatan	193134	119507	44565	21900	975031	155055	44565
7	Bangka Belitung	-	-	-	-	-	-	-
8	Bengkulu	5917	-	-	24077	24077	-	-
9	Lampung	-	-	-	-	-	-	-
10	DKI Jakarta	-	-	-	-	-	-	-
11	Jawa Barat	-	-	-	-	-	-	-
12	Banten	-	-	-	-	-	-	-
13	Jawa Tengah	-	-	-	-	-	-	-
14	D.I. Yogyakarta	-	-	-	-	-	-	-
15	Jawa Timur	-	-	-	-	-	-	-
16	Bali	-	-	-	-	-	-	-
17	Nusa Tenggara Barat	115048	101093	87115	-	-	-	87115
18	Nusa Tenggara Timur	-	-	-	-	-	-	-
19	Kalimantan Barat	522019	1408145	247356	175763	3853258	192586	247356
20	Kalimantan Tengah	2092655	590162	15408	3011987	5831175	1873058	615695
21	Kalimantan	342335	214258	174030	1268278	1040318	495072	11400

	Selatan							
	Kalimantan							
22	Timur	1276420	2125059	547265	10281151	2393351	1416900	799680
23	Sulawesi Utara	142147	40634	49635	11437	11437	40193	49635
24	Gorontalo	-	-	830	830	830	430703	-
25	Sulawesi Tengah	94487	3450	86582	782405	808555	34713	86562
26	Sulawesi Selatan	527849	44321	292218	162201	162201	41368	124415
	Sulawesi							
27	Tenggara	128127	108859	47837	14400	11196	43165	47837
28	Maluku	718678	367876	258392	209288	325526	1188447	384447
29	Maluku Utara	-	-	-	-	-	-	-
30	Papua	2949688	107630	699069	511492	650932	1173353	699069
31	Irian Jaya Barat	-	-	-	-	-	-	-
	Total	**12.160.668,00**	**8.193.203,00**	**4.035.409,00**	**18.193.174,00**	**17.439.096,00**	**7.617.067,00**	**3.851.729,00**

Source: Statistic data of Ministry of Forestry, 2004

Natural forest management by traditional community is implemented, based on Ministry of Forestry and Plantation Decree No. 677/1998, through management of forests conducted by community around the forest within specific concession. The concession is located either on production forest, protection forest, or conservation forest areas in order to produce wood or non-wood forest products by conducting plantation, protection, harvesting and marketing relevant with village purposes of consumptions.

In line with giving access to local community toward forest local governments were also issuing, for example in Malinau Municipality, policy through small scale of forest conversion licenses located on conversion forest designed as 'Social Forest' or ***Hutan Rakyat*** or Privately-owned Forest or ***Hutan Milik*** which is legal within 3-6 months with possibility to be renewed up to three times. It is implemented based on the assumption that Government Decree No. 62/1998 giving authorities partially in forestry sector to the regions to oversee the activities related to tree planting, maintenance, harvesting, utilization, marketing and development. Revenues are collected through fee payments such as 'third party donation' (based on large of permits) and production retribution fee based on timber harvested. However central government finally suspended this policy due to loss of control over allocation of HPHH permits and potential revenues from regions. Furthermore there was opposition toward this policy mainly by NGOs which considered to cause environmental impacts of such practices.

Within plantation forest concession, there are two main programs conducted in order to promote social and economical of communities around the forest areas namely *Tumpang sari* allowing people to cultivate crop in between forest plants. The purposes of this program are to optimize the use of remained space of forest land and to reduce weed growth. This practice reduces significantly plant maintenance until individual tree is established.

There is also scheme of plantation forest development namely ***HTI-Trans*** involving transmigrants in order to provide the labors in which each household of transmigrants is also provided with housing and parcel of agricultural land accounted for 2 hectares per house hold.

Within concession activities, there are job opportunities provided in forest utilization related to timber extraction of natural forest concessions and plantation of plantation forest concessions. Within natural forest concession, workers can be involved in timber cruising, timber felling, timber extraction and timber logging, and timber processing while within plantation forest concession, job opportunities, related to seedling, land clearing, planting, maintenance, and harvesting.

Based on the type of job contracts, there are some job types such as chores, targeted contracts or work contracts. Unfortunately, the limited modalities and skills impedes local communities to be involved in work contracts considered significantly gaining higher of income than chores and targeted contracts with higher payment. Job opportunities provided are timber felling contracts, timber logging, land clearing contracts, forest road constructions, housing constructions, etc. Mostly local people involved in such activities as worker for chores forest concession activities are paid based on daily work with guarantee of job continuation. Job opportunities offered are seedling, weeding, maintenance, etc.

Type of job and limited equipments determine appropriate gender to be accepted in forestry concession. The higher risk and heavier of jobs, such as timber felling, land clearing, etc, will be conducted by men while less risk job will be conducted by women such as seedling, planting, maintenance etc

Currently, there are changing attitudes of communities around the forest which either to conduct individually or be involved in illegal logging activities as the easiest way for getting quick money for their subsistence. It is supported by good

market for illegal timbers for high demand of forest industries. Hubeis in Mathews (2001) stated that communities around the forests are ordered to collect timbers from the forests which are mostly stolen from natural forest concession areas by investor supporting them with finance and equipments.

Social and economic condition of communities around the forests and their dependence on forest lead to conflict with concessionaires. Initially they consider forests as source of foods, hunting, and ancestor heritages and have spiritual values having been owned long before concessionaires.

Based on concepts of decentralization, forest management, and sustainable forest management and forest utilization practices within decentralization era, and the investigation on forest utilization practices conducted in Indonesia will be elaborated on the following chapter.

Chapter 4 THE APPLICATION OF SUSTAINABILITY PRINCIPLES IN FOREST UTILIZATION IN INDONESIA

In order to assess the trends of forest utilization practices in forest management within perspectives of sustainable forest management, we will investigate further in detail about the sustainable principle in forest utilization as formulated on Chapter 2. Such practices are then viewed based on perspectives of Policies and Institutional Framework, Forest Resource Security, Flow of Forest Product, and Social and Economical Aspects.

4.1 Policies and institutional framework

Within the transformation process, there are approaches conducted toward improvement of governance through decentralization, sustainable forest utilization (aspects of forest management), and market reform. These three approaches address the needs for devolution of governmental authorities on forest administration aimed to improve roles of local government with the assumption that central system is inefficient of controls and lack of equity in regional development and local participation.

Indonesian forestry sector has already had Basic Forestry Law (BFL), under Constitution 1945, which has the same level of regulation of other sectors issued, and will become legal basic regulation of forest development. Forest administration and management are determined between level of government, central and local government regulated by Law No. 22/1999 about regional government and No. 25/1999 about shares of revenues between central and local government. However there are still limited regulation on implementation and law implementation is not effective due to conflict of interests, lack of coordination.

Prior to this decentralization forest exploitation was aimed to support economic growth through concessionaires. Policy instruments were employed through Forest Land Allocation (based on FLUC and PSP), Forest Production Plan as basis for issuance of concessions, Felling Regulation conducted (in order to control sustainable forest tress), Revenue Generating Income (by employing royalties, license fees, property taxes, and reforestation fees), and Non-Forest Purposes (which regulates forest exploitation over forest conversion). Within the decentralization, in Forestry Sector, there are enactments of regulation related to Decentralization (Law No. 22/1999), Regional Government (Law No. 22/1999), Shared Revenues from Natural Resources (Law No. 25/1999), and Basic Forestry Law (Law No. 41/1999). The first three regulations provide more roles of local authorities and local participation toward forest resources and more share from natural forest exploitation. However, it still required more regional governmental accountability. Basic Forestry Law also provides individual and community to participate in forest resource exploitation and acknowledgement of customary lands. It reflects the efforts to improve community empowerment although there are still limitation and inadequacy of bargaining position due to lack of skills and modality.

Based on the illustration above the most significant changes are more on local governmental and local participation toward forest resources by taking more roles on authorities of forest administration and more access of local community toward forest and acknowledgement of their customary land and laws. However, the way to view forest resource is almost the same as that prior to decentralization period, even worse, which consider forest as resources to support economic development related to economic growth through national and local revenues and improvement of subsistence of local communities. The policies and practices on fields seem to "reflect short time horizons" (Ascher, 2000) which is even much shorter than specific characteristic of forest management which need long period of time to mark on its biological time scales of renewal of resources which complicating by struggling of power among level of governments.

The challenges to the Indonesian decentralization on forestry sector are how to balance the needs for development and immediate income for communities against the need for maintaining resource sustainability and inconsistency between autonomous governments in interpreting relevant regulations[23]. The tendencies of autonomous governments to maximize revenues for local resource or ***Pendapatan Asli Daerah (PAD)*** and the absence of any government regulation on the fields have resulted in conflicting interpretations. This has brought about negative impact toward sustainability of forest resources. Forest management has been experiencing cases where the implementation of decrees concerning forest utilization issued by municipal governments has resulted in further forest degradation.

However, to cope with such issues immerged, for the last few years, forestry sector has been conducting policies, known as restructuring forestry sector, which focuses on securing tropical rain forest through rehabilitation of degraded forest land and conservation of the remaining forests, eradication of illegal logging, forest fires, restructurization of timber-based industry, timber plantation development and decentralization in forestry management.

4.1.1 Enabling Condition for Sustainable Forest Management

Policy and Legal Framework

As a consequence of decentralization processes, forestry sector has been shifting forestry policy and legal framework through the issuance policies and relevant regulations. It is characterized by the transformation of governmental administration system which is more decentralized compared to previous system which is obviously centralized. It is reflected on the changing of roles and

[23] Three regulations are significantly related to decentralization in forestry sector namely Law No. 41/1999 about Forestry, Law No. 22/1999 about Regional Government and Law No.25/1999 about Share of Revenues between central and local government toward timber harvested.

responsibilities of central and local government in forestry sector. The recent Forestry Basic Law which has been issued namely Law No. 41/1999 is aimed to accommodate such changes which provide local authorities and to take more roles and responsibilities and promote local community for better accesses toward forest resources.

Indonesian forestry has adopted the concept of sustainability which is implemented on the forestry sector namely Sustainable Forest Management (SFM). Government Regulation No. 34/2002 is issued to provide legal basic for the concept of SFM requiring good performance of forest management based on defined criteria and indicators as supported toward two lower level regulations named Ministry Decree No. 576/1993 and No. 610/1993 determining criteria and indicators of Sustainable Forest Management on Natural Forest Concessions and Management Practices in Unit Level. Moreover, there is a policy for improvement of productivity of forest areas. The government improves plantation forest development through a scheme of plantation forest concession on less productive permanent forest areas by providing incentives through zero interest of plantation development loan (DR) for such development.

In the demand side of timber, related to forestry industries, there are regulations determining the performance on criteria and indicators of sustainable forest management of industry practices stipulated on Government Regulation No. 34/2000 supported by Forestry Ministry Decree No.6884/2002 and No.303/2003 regulating evaluation procedures and assessment of industrial performance. It is conducted as response toward international market of timber forest product trading which is needed for adequate implementation of sustainability principles of raw timber resource and industrial processes. However, the implementation of these regulations is still insufficiently executed on the fields due to lack of capability of forest industries which regard to both sustained operation of industries and job opportunities.

In order to synchronize the capacity of forestry industries with potential supplies of timber, the government implements a policy of 'soft landing' which gradually declines cutting quote in order to restructure forestry industries in accordance with timber supplies resulted from natural and plantation forests. It is conducted by simultaneously decreasing pressure on natural forest and improving the development of plantation forest. However this policy still insufficiently affects sustainable forest management practices due to partial approach conducted by authorities, limited within their roles, and lack of formal comprehensive procedures involving all relevant parties whose issues occurred tend to be solved through case by case approach but lack of coordination.

In the regional level, decentralization is considered as an opportunity both by provincial and municipal governments to take more roles and benefits for forest resources in order to gain regional revenues or ***PAD***[24] . By the enactment of Law No. 22/1999 and No. 25/1999 the municipal governments use them to generate local income by securing the benefit of natural resource utilization by securing share of forest utilization fees distributed to regional government and taxes and establishing local corporations. It is resulted from both Forest Resource Rent Provision or ***Provisi Sumber Daya Hutan (PSDH)*** and Reforestration Fund or ***DR*** and creations of regional regulations on timber harvested and concession areas through fees and taxes. In forestry sector, development conducted tends to emphasize on economic interest and pay less attention on environmental capacity and natural processes potentially resulting in disability of forest resources to maintain its roles on environmental, economical and social aspects as determined on formal objectives of forest management.

[24] In order to improve local revenues some municipal government has created regulations i.e. in case of Kutai Barat Municipality in 2000 which had made draft of 13 local regulations prepared prior to assembly establishment considered as a quick response toward decentralization. Some municipalities established municipal government companies such as 'PD Danum Belum' in the local level of Central Kalimantan which functioned to extract timbers under new decentralization regulation (McCarthy, 2001). As consequences the local government should facilitate these companies by providing necessary incentives and applying them to central government for concession which are currently under concessions of state owned companies.

Related to local community interests there are regulations that are considered as Social Forest or ***Hutan Rakyat*** or Privately-owned Forest or ***Hutan Milik***. It has efforts to provide access for local communities toward forest. Furthermore there is also issuance of Small scale Forest Utilization or ***Hak Pemungutan Hasil Hutan (HPHH)*** resulting in timber extraction for local uses with small size of concession and limited harvesting equipments. Although this policy later on is banned by the Ministry of Forestry due to violation occurred in its implementation, this policy had been significantly colouring forest management practices in decentralization era. Those policies are conducted by regional government based on the Government Decree No. 62/1998 providing regional authorities to regulate forestry activities and by Forestry sector based on Law No. 41/1999 to regulate forest utilization for local communities. It describes that forest utilization has already formal framework addressing community involvement and access improvement of community toward forest but it has failed in filtering target group of community. It tends to benefit certain community elites due to such community limitations which tend to provide opportunities for previous actors to benefit from forest utilization.

Related to community empowerment, decentralization process is benefiting local communities by the increase of community participation and consultation in local government especially NGOs which are actively involved in the process of decision making. There are some regions which significantly experienced such cases characterized by improvement of roles of communities, among other regions, are NGOs in Samarinda and Balikpapan. They have more voices for better decision making and government accountability. They are invited by local government for meeting and discussion in order to transfer skills, expertise, knowledge even to draw up district regulations (Casson, 2001).

As a response to global trading requiring sustainable forest management, there is adoption of certification of forest product. It is an assessment toward performance

of sustainable forest management based on defined criteria and indicators formulated by Indonesian Eco-label Institution or ***LEI*** involving independent institution for such assessment. However the implementation of this policy currently is still on voluntary basis but Wardoyo 9(2004) states that it will be mandatory basis for forest management practices.

4.1.2 Administration and Role of Local Government

Within decentralization, there are changes of forest administration in the mid of 2000 which are formerly centrally represent by Regional Agencies of Ministry of Forestry or ***Kanwil Kehutanan*** to Provincial Forestry Services or ***Dinas Kehutanan Propinsi***. It is characterized by the distribution of tasks and responsibilities institutions and staffs from the central government to provincial government and municipal governments especially on administration, development, and forest businesses while reforestation and rehabilitation, conservation, forest inventory and mapping are still the responsibility of central government through its technical regional units[25].

Municipal forestry agencies which formerly take authorities based on river basin named Branch of Forestry Services or ***Cabang Dinas Kehutanan (CDK)*** are now replaced by new institutions formed under regional administrative boundaries relevant with governmental administration authorities. It implies the changing of forest management from geomorphologic characteristics to administrative-political approach where each local authority significantly has roles toward forest resources on their administrative boundaries. Unfortunately, this shift still fails to adopt territorially integrated approach among administrative boundaries both between up-stream and down-stream (longitudinally) and across catchments areas (laterally) of river basin.

[25] For example, in Riau Province reforestation and rehabilitation, conservation, and forest inventory and mapping are conducted by Sub Regional Agencies of Reboisation and Rehabilitation and Inventarization and Forest Land Use are respectively as technical regional agencies. Provincial Forestry Services are responsible for day to day administration of concessions in provincial level.

Those roles and responsibilities are ruled on Law No. 25/2000 defining the divisions of roles and responsibilities between central government and provincial government. However, there are experiences indicating unclear roles of authorities which basically determine the roles on forestry sector in each level of government. This is caused by differences of interpretation toward laws issued related to decentralization both of governmental administration and forestry sector. Furthermore there are also unclear solution and administration of overlapping boundaries such as concessions or protected areas located on two or more administrative boundaries. The river basin approach actually can define forest management and institutional interplay to achieve its sustainability. Therefore, there are needs for enhancement of coordination between provincial and municipal government to identify new regulation to support regional autonomy and to create more compatible institutional framework and biogeophysical characteristics of forest management design.

4.1.3 National Objectives for Production Forests

The objectives of forest management are stipulated on Law No. 41/1999 where it leads to promoting prosperity, justice and sustainability by establishing forest existence and its production function and society involvement. Forest existence is valued based on sufficient forest in region in terms of wide and proportionality of its distribution. In order to achieve justice and social involvement on production forests, the government takes roles on management of forest as stipulated on Section 3 of article 4 of Law No. 41/1999 determining that forest resources as state owned. Therefore the state takes the roles on forest administration, forest functions, managing related parties involved in forest management, and legal framework. Despite state roles on forest resources, the government also considers the existence of local wisdom and custom forests considered still exist.

Related to forest utilization timber productions are resulted from permanent forest areas as stipulated on Law No.41/1999 consisting of both natural forests and

plantation forest through concessions scheme located on production function of forest areas. Production forests function as producers of forest product which in this case is related to timbers harvested.

Sustainability of production and benefit, stipulated on section 1 of Law No. 41/1999, are considered as main principle of forest management on production forest meaning continuum of productions of timber harvested from remained forests which are stable on its quality and quantity. Furthermore, forest management is also required to adopt the principles of nationality, justice, togetherness, openness and integrity.

4.1.4 The Establishment and Security of Permanent Forest Estate

Natural forest concession and plantation forest concession are located on permanent forest area functioned as productive forest. Some efforts have been conducted in order to establish and secure permanent forest areas consisting of strategic level and operational level.

In strategic level, the establishment of permanent forest area is determined based on formulation resulted in Integrated Harmonization of Provincial Spatial Planning or ***Tata Ruang Wilayah Propinsi (RTRWP)*** and Forest Land Use by Consensus or ***Tata Guna Hutan Kesepakatan (TGHK)***. These two strategic decisions are resulted from integration of related sectors through spatial land use coordination between Ministry of Forestry with other sectors related to land use such as Ministry of Mining, Ministry of Agriculture and Estate, etc determining forest areas and other land uses. In provincial level, there is coordination between Ministry of Forestry and regional governments to formulate provincial land uses related to forest areas and other land uses. There are also some cases where regions integrated forestry spatial planning into local spatial planning such as Kapuas Municipality in 2000 by revising current spatial planning with ***padu serasi.***. It means that there are efforts conducted by local authorities to

synchronize the central and local policies although some other regions still lack of such implementation.

In operational level, efforts are conducted to guarantee forest areas through demarcation of forest boundaries. It functions to formalize forest areas based on decisions resulted from forest boundary committee consisting of relevant parties such as relevant departments, provincial and local government, forestry agencies etc determining exact forest areas. Up to 2004 there had been demarcated forest areas accounted for 78,35 % of total target boundary lines based on Land Use Consensus (FLUC) of 281,873 Km. It means that almost all forest areas have been demarcated, although these efforts suffer from lack of acknowledgment of its existence by related parties who have interests on forest areas.

4.1.5 Land Tenure and Property Right Relating to Forest

State ownership over forest areas is considered a legal basis for Government to assign Ministry of Forestry to determine and manage forest areas[26] distinguished as state land[27] and private lands[28]. Forest utilization practices are conducted on permanent forest areas functioning as productive forest through concession either state owned concessions, private concessions, or community concessions. Basic Forestry Law No. 41/1999 states that the state controls over all forest areas including productive forest but also recognizes private forests under customary community laws although the existence of customary forest or ***hutan adat*** is determined as state forest but managed by communities. Within this customary forest it is allowed either to collect forest product for daily needs, to conduct forest management based on customary laws, or to be empowered for improving their welfare (Nanang, 2000). This is resulting in ambiguity of land tenure over community lands ownerships.

[26] Forest areas, based on Law No. 41/1999 are considered as certain areas determined and maintained by government as forest.
[27] State forest is forest under control of government without private land rights
[28] Private forest is considered as forest consisting forest land and land covered with private right

Therefore, forest utilization practices suffer from forest conflicts due to lack of dispute solution and of limited implementation of laws on the fields for such deviation. Moreover there are also limited data provided related to customary rights toward forest. Private parties has also responsibility for social cost, besides formal requirements, such as concessions issued on stated forest have still potential conflict immerged related to forest in terms of forest products and forest areas with communities in and around the forest. Limitation of monitoring and recording of such conflicts affect limited official report related to forest conflicts which provide forest disputes occurred on forest utilization practices. There as many causes resulting forest conflicts but certain workshop reported[29] that factors contributing to forest conflict related to:

- Geographical area;
- Forest resources;
- The type of industry where forest products are used.

Within the governmental administration, there are also problems with inferiority of forestry sector compared to sectors with significantly peroducing economic earning such as mining and energy and lack of coordination and synchronization with other sectors such as transmigration, mining, agricultures etc are complicating conflicts-related forest[30]. Furthermore, many studies reported that forest conflicts were involved parties such as military, policy, political parties, etc which significantly contribute to obstruction on forest utilization related to forest through illegal cutting, forest fires and forest areas through forest land occupation, encroachment etc (i.e. see: Growing Conflict and Unrest in Indonesian Forest p.4).

Examples of forest-related conflicts related to geographical occurred between concessionaires and communities over forest lands while conflicts over forest

[29] Summary Paper titled Growing Conflict and Unrest in Indonesian Forest: A Summary Paper at www.usaid.gov (Juli, 2006)

[30] The government is now on proposal to revise the article 38 of Law No. 41/1999 prohibiting mining activities on protection and conservation forest. It is due to already signed of work contracts ratified prior to current government and the enactment of Law No. 41/1999.

resources occurred due to overlapping toward forest resources claimed as belonging to communities as ancestor's heritages. These are examples of forest-related conflicts[31]:

- On plantation forest purposed for pulp and paper in North Sumatera Province and Riau Province (Sumatera);
- On commercial and small scale logging operation in Kalimantan;
- On limited access of communities to natural forest occurred in Papua.

Within Law No. 41/1999 it is defined that all forest areas are under state ownership but with acknowledgement toward customary land which is ruled by community not personally characterized by customary laws. However, this legal framework has been criticized sounded for insufficiency of state toward local ownership over traditional forest known as Community Forest or ***Hutan Adat*** because of weak evident for its establishment as main requirement on the Law.

The detailed qualitative description of forest utilization practices, in the principle of "Ecosystem Functions is Maintained related to criteria of Enabling Condition for Sustainable Forest Management", within this perspective, sustainable forest management can be described on table 4.1:

[31] See: Growing Conflict and Unrest in Indonesian Forest p.4.

Table 4.1 The description of forest utilization practices, in principle of "Ecosystem Functions is Maintained related to criteria of Enabling Condition for Sustainable Forest Management"

No	Indicator	Targets	Description of Implementation	Impacts on Sustainability
1	Policy and legal framework Number of adequacy of institutions to support sustainable forest management The degree of public participation in forest management namely in planning, decision making, data collection, monitoring and assessment	Synchronization rules and regulation Improvement of coordination with other sectors and other parties Improvement of coordination of different level of forestry institutions	There are five main policies namely eradication of illegal logging, restucturisation of forest industries, prevention of forest fires, conservation and rehabilitation, and decentralization of forestry sector There are regulations related to forestry sector and government administration, however there are still needs for harmonization among sectors and level of authorities. There are struggle and negotiation related to authorities stated on the regulations There are few cases, in some regions, experiencing public participation and consultation involving communities and NGOs.	There are policies and regulations defining forestry sector, regional government and share of revenue over forest providing guidance for sustainability. However, the miss match interpretation on regulations related to decentralization is resulting in effectiveness of forest administration Struggling of authorities, and emphasizing generating and securing revenues between central and local government over forest resources will potentially lead to over exploitation. The involvement of relevant parties on public consultation and participation improves accountability and transparency of forest management
2	National objectives for forest including production, conservation and protection	To guide forest management within the framework of sustainable forest management	There are National Forestry Strategic Plan, Government Decree and Ministry Forestry Decree	Providing guidance for sustainable forest management practices from strategic to operational level
3	The establishment and security of the permanent forest estate	To guarantee the establishment of permanent forest estates	There is physical establishment of permanent forest areas but they lack of forest security	The physical establishment of forest areas without forest security will result in the degradation and deforestration occurred on forest areas

No	Indicator	Targets	Description of Implementation	Impacts on Sustainability
4	Land tenure and property rights relating to forest	To guarantee forest utilization practices conducted properly by concessionaires.	State owned forest areas, only for utilization rights, no private ownerships, but less guarantee from authorities over external claims	Less seriousness of concessionaires to conduct sustainable forest management due to law uncertainty and financial recovering
5	The control of forest management	To guarantee the sufficient implementation of silviculture system and sustainable forest management	Lack of control by central government and local government	Insufficient silviculture system implementation which results in declining of forest quality and quantity.
6	The control of forest harvesting	To guarantee forest sustainability and economical benefit from timber harvested	Central government emphasizes on timber fee and levy while local government more concern on securing share revenues and generating local revenues.	It improves economical development but declining environmental quality
7	The control of encroachment	To guarantee forest area established	Based on coordination among relevant public institutions with case by case approach and lack of law enforcement	No clear mechanism will lead to un-solving forest encroachment, forest degradation, and deforestation
8	Number and adequacy of institutions to support sustainable forest management	To address governance and accountability of forest management toward sustainability of forest management	Limited support with attention from related parties based on their own perspectives and interest but lack of whole framework of sustainable forest management	Sustainability needs for process resulting in sufficient support from relevant parties
9	Institutional framework	Sufficient formal and legal framework and processes	Sufficient policies and regulation but insufficient process related to parties involved with miss match of interpretation, un equal power resulting in part aspects of forest management implemented	Sustainability needs for process resulting in sufficient support from relevant parties
10	The adequacy of stake holder involved	Sufficient framework of stake holder involvement	Insufficient framework of stake holder involvement especially for less powered parties namely customary communities	Sustainability needs for sufficient process of consultation in order to gain support from all relevant parties

4.2 Sustainability of Forest Resource Security

The stability of forest stands and forest areas determine the sustainability of forest resource security. It is reflected on the level of existence and proportion of land under natural and plantation forest. It describes the condition of forest resource base in terms of land use forest areas. The study on forest resource security refers to forest stands and forest areas related to timber productions especially over permanent forest areas functioning as productive forest areas.

4.2.1 The Amount of Forest Resources

The amounts of forest resources basically depend on the establishment of permanent forest where productive forests are resulted. At the beginning, productive forests area covered by natural forest plantation defined as raw material of forest industries resulting in timber supplies. This type of forests becomes the main sources of forest industries whose roles have been decreasing due to threats occurred toward permanent forest areas ending up with forest degradation and deforestation. There have been massive threats toward natural forest such as illegal logging, illegal occupation, illegal conversion, encroachment, forest fires, etc.

Currently, in order to support timber supplies plantation, forest developments are conducted as a response to diminishing roles of natural forest as timber supplies which significantly suffers from massive degradation due to illegal logging practices. In the long-term, plantation forest development is aimed to replace timber supply roles although they are currently still mainly sourced from natural forest. Plantation forest development is also aimed to improve forest land productivity, mainly on forest areas which previously are used as natural plantation forest, will be prioritized on less productive forest areas

Unlike of natural forest where timber supplies are based on given species growing on the forest areas the efforts to increase the amount of plantation forests are conducted through some programs based on desired forest timber raw material of forest industries. Related to the urgency of timber supply, they are needs for forest industries plantation development conducted by planting one or few numbers of species which classified as fast growing species. Based on raw material needed there are plantation forest developments aimed to produce timber either for sawn timber, and pulp and paper industries while based on type plantation development schemes, there are Sawn-wood Industrial Plantation Forest, Transmigration Plantation Forest and Pulp and Paper Industrial Plantation Forest.

In order to promote plantation forest development there is incentive provided by the government in terms of funding loan with no interest namely reforestation fund or ***Dana Reboisasi (DR)*** . This funding is collected from timber harvested fee from natural forest plantation. Right after the enactment of Law No. 7/1990 about Plantation Forest Concession, there were increasing numbers of concession to be established on this type of concessions located on millions of hectares of permanent forest areas. However there were critiques related to seriousness of concessionaires to develop plantation forest suspecting to gain low funding provided for plantation forest development. This is a response toward the insufficient performance of such development of forest within this scheme. This bad performance is caused by lack of land suitability assessment; genetically improved seed, limited technical knowledge, and lack of choice of commercial timber plantation altogether contribute to low performance of plantation forest development.

4.2.2 The Changing of Forest Resource

The amount of forest resources is designed through establishment of definitive forest areas, namely ***TGHK*** and ***RTRWP***, determining forest management on the particular areas. The arrangement of this spatial land use planning is arranged through integration of relevant public authorities with the level of government,

inter related sectors and public consultations. Therefore, it becomes basic spatial planning within provincial administration. Permanent and limited productive forest areas[32] take important roles on certainty of forest areas which in turn determine the level of timber supplies. However, timber supplies, up to now, are not only from permanent forest areas but also supported timber supplies resulted from conversion forests which mainly consist of natural forests.

The changing of forest resources are determined by the sustainability of forest trees and forest areas. Forest trees harvested are determined by the level of exploitation conducted both by concessionaires by employing legal silviculture system required or illegal logging conducted by concessionaires themselves or outsiders. Furthermore there are natural processes which determine the sustainability of forest trees such as forest fires which significantly decrease million hectares of forest causing of economic loss. However, sustainability of forest trees much more depend on the level of silviculture system implementation.

Forest area determines the capacity of forest resource deposited on those forest areas which basically depend on both internal and external factors. Internal factors determining forest resources are related to establishment of forest demarcation which is conduction through delineation and signing of forest areas, while external factors are related to the acknowledgement of other sectors, parties, and communities toward the establishment of forest areas. There are some issues of forest areas either of violation of forest areas through occupation, claims, etc or of less land use management through over lapping of forest areas with other sectors, village administrative boundaries, etc.

Furthermore, overlapping land use boundaries are significantly caused by insufficient surveys for investigation of timber resources and identification of areas suitability conducted before the issuance of permits. It is based on available

[32] Determination of forest function such as permanent forest areas, protection forest areas, and conservation forest areas are based on physical and geographical characteristics.

data at hand which is complicated by less coordination among the level of public authorities responsible for overseeing different concession types. For examples, there was the establishment of small scale concessions which is overlapped with current concessions.

Forest resource is also diminished by bad practices of management conducted by concessions with lack attention on efforts to promote forest re-growth for a second cutting (Simarmata, 2000) which are conducting level of timber extraction exceeding the ability of forest through its natural system to form climax forest as prior to extraction practices.

The detailed description of forest utilization practices, in the principle of Ecosystem function is maintained related to criteria of forest resource security, within the perspective of sustainable forest management can be described on table 4.2.

Table 4.2 The description of forest utilization practices, in the principle of Ecosystem function is maintained related to criteria of forest resource security

No	Indicator	Targets	Description of Implementation	Impacts on Sustainability
1	Extent and percentage of total area	To guarantee the size and production forest functions	There are definitive forest areas based on its functions with only few regions are in process of establishment	Definitive forest areas will support the existence of forest areas determined based on demarcation of forest areas
2	Extent and percentage of total land area under each forest type	To guarantee the size and production forest functions through Forest Land Use by Consensus (FLUC) and Provincial Spatial Planning (PSP)	Clearly official defined most of forest areas based on its functions and types and only three provinces have not established forest areas	There are certainty of forest areas which agreed by relevant public authorities inter and intra sectors
3	Length and percentage of external boundaries of the permanent forest estate demarcated or clearly defined	The establishment of productive forest areas based on defined permanent forest areas.	Reached 78 % of total forest areas but lack of community acknowledgement.	The less acknowledgements of communities result in less establishment of forest demarcation.
4	Area of permanent forest estate converted to permanent non-forest use	To provide non forest purposes of forest lands (conversion forest)	Currently there is no forest conversions policy officially ('moratorium policy') but illegal forest conversion is still occurred	This moratorium policy has been effectively diminishing forest exploitation resulted from legal permits but less control over illegal forest conversions
5	Existence of procedures to control encroachment, fire, grazing, grazing, and illegal exploitation of forest	Well-managed forest utilization	Limited coordination and procedures among relevant parties conducted based on case by case approach	Limited coordination and case by case approach to cope with forest threats are resulting in less comprehensiveness and formal procedures of problem solutions

4.2.3 Current Forest Resource Security in Sustainability Perspective

Forest utilization seems to conduct limited implementation of sustainable development which requires appropriate interaction and coordination of all actors which play roles through intervention and actions in local, regional, and national level. Therefore, there are needs for reformulation of power relations in decision making among all actors in development process. It is related to the adoption of

function of public and private sectors, local communities and NGOs which enhance public interests, and new paradigm toward forests.

Security of forest resources needs appropriate spatial planning which functionally allocates land which in accordance with forest functions and safeguarding its existences. It has to be strongly implemented on regional level which political and socially are supported by local communities. It can be implemented through distributing forest areas on the regions assured by forest boundaries with no conflicting with other purposes such as farming, settlement, etc. It is reflecting the needs for integral spatial planning by harmonizing "man-made systems" with "natural systems" and defining the intensity of exploitation toward natural resources including forests. These two considerations will lead to appropriate formulation of ecological carrying capacity of forest resources within regions

Indonesian forest management has been suffering from "invisible hand" which seeks for economic benefit in which forests utilization with its environmental characteristics, environmental and economical benefits have been simply identified as vehicle for income generation. It reflects the failure to take into account environmental characteristics of forests. On the other hand, forest within its ecological systems has finite tolerance toward such disturbances.

4.3 Sustainability of Forest Product Flow

The desired condition related to sustainability of flow of forest product is a sustainable supply of timber and optimum operation of forestry industries. Among other causes of illegal loggings and over capacity of forest industries mostly contribute to instability of timber supplies. In Indonesia context it is caused by mismatch supply and demand of timbers due to uncoordinated expansion of forest industries, high profitability of forest utilization, and low risk of operation for such silviculture practice violations. Therefore, the implementation of regulations

on the fields, how to manage supply and demand of forest timber, determines the forest sustainability.

4.3.1 Supply Management of Forest Production

The increasing forest product is mainly affected by external factors such as due to the high demand of international market over forest product which is responded by private through increasing industrial capacity. Related to this situation the government has been conducting timber export prohibition and obliging concessionaires to have network with forest industries in order to support timber supplies. However, it seems to indicate that legal timber supplies can not pursue the demand of timbers in which lack of such supplies are fulfilled from illegal sources.

Supply of timber is suffered from unsustainable forest utilization practices conducted by concessionaires, the failures of plantation development program, and illegal timber exploitation. Furthermore, structural problem results in undervalued timber value in domestic market compared to international market due to integration between forest concession and forest industries caused by monopoly and conglomeration.

Within the decentralization era, the production is increased, and in turn forest conversion and destruction are also increased. This phenomenon suggests that the production forest decreased is due to improper forest management and excessive forest exploitation. Moreover, increased forest production and forest conversion and other sources indicate that forest timber supplies tend to decrease over time.

In order to address this problem, there are efforts to promote plantation forest program through Industrial Plantation Forest Concessions, Transmigration Plantation Forest Concession, and Pulp and Paper Industrial Plantation Forest Concession. The government has been imposing the development of these timber resources, through loan incentive of DR and amenity of licensing which is being

projected to support and to replace natural forest sources. However there are problems with its development due to unsatisfactory performance, conflict-related forest areas, and overlapping areas.

4.3.2 Demand Management of Forest Production

The major forest products in Indonesia which are from wood-based industries[33] sourcing from domestic natural and plantation timber forests are mostly provided locally through subsidiaries or concessions. The development of forest industries is stimulated by international demand on forest products which are currently exceeding supplies of timber mainly resulted from natural forest. Furthermore, there are smaller scales of mills which are not integrated on forest concessions resulting in more demand of timber supplies considered as dominant business. These two timber demand agents, forest industries and small scale of mills, are significantly affecting the amount of timber demand that have to be fulfilled. These forest industries had experienced rapid increase of capacity. However, this rapid development in industries has not been balanced by an improvement in timber supplies resulting in deficit of raw material of industries. The discrepancy between timber demand and capacity of timber supplies leads to illegal logging and illegal trading. The worsening balance between demand and supplies of timber brought about further forest degradation.

Policy of 'soft landing' [34] can not sufficiently cope with degradation process since no policies affect capacity of forest industries, re-structurisation of forest industries, which stimulate illegal timber supplies. Therefore, restructuring timber-based industries is considered as necessary efforts to control demand for timber from domestic sources while in supply side there is requirement to conduct good performance of sustainability of natural forest management employing criteria and indicators of sustainable forest management, although it is only for

[33] Forestry industries are consist of sawmill, plywood, pulp and paper, block board, and chip mills which require timber at capacity of millions cubic

[34] Soft landing policy is policy implemented to gradually reduce annual allowable cut by province determined by Ministry of Forestry based on sustainability of forest resource per regions

international forest product market, at unit level and monitoring and evaluation procedures.

The detailed description of forest utilization practices, in the criteria of Ecosystem function is maintained related to criteria of continuity of flow of forest product of timber, within the perspective of sustainable forest management can be described on table 4.3.

Table 4.3 The description of forest utilization practices, in the criteria of Ecosystem function is maintained related to criteria of continuity of flow of forest product of timber

No	Indicator	Targets	Description of Implementation	Impacts on Sustainability
1	Extent and percentage of forest for which inventory and survey procedures have been used to define the quantity of the main forest products and resource rights and ownership	To determine the potency of forest resources to supply timber for forest industries	Sufficient inventories are conducted by authorities as regular program and privates as requirement for forest utilization permits although there are indications intended of the increased timber potency reports by privates in order to extract more timbers than supposed to be	Insufficient efforts to conduct sustainable forest utilization have resulted in forest degradation
2	The class or category of owner or right holder such as forest lands, both permanent forest and others	To determine the exact permanent forest areas	State owned land and concessionaires only have exploitation right over concessions operated by private, state, and communities.	This gives basic calculation for potential support of production forest and other sources namely social and community forest to produce timber
3	The level of sustainable harvest from lands managed as permanent forest estate, by main forest product and other forest type	To evaluate the annual level of sustainable harvest of timber on permanent forest areas	Over exploitation of natural forests and limited supplies from plantation forests. Officially, there are policies implemented namely “soft landing policy” and “restructurization policy”	This over exploitation has exceeded the regeneration ability of natural forests while plantation forest development has not been successfully implemented. Policies implemented can only affects to legal timber sources but less affect to illegal timber sources
4	The quantity or volume of wood being harvested from permanent forest estate and other forest lands	To support timber demands of forest industries	Mostly from natural forest, forest conversion, and other forest function, but limited source from plantation forest	Timbers mostly yielded from natural forest exceeding its re-growth ability tend to result in degradation of natural forest, while timbers sources from forest conversions can not provide sustainable timber supplies

4.3.3 Current Forest Product Flow within Sustainable Perspective

Forest utilization practices in Indonesia has adopted development concept which promote economic growth through economic benefit but lack considerations on the maximum capacity of nature in terms of forest for self-regeneration. It is irrelevant with the indicator for strong sustainability which defines forest utilization, within the carrying capacity of forest resources, with consideration of the maximum amount of timbers produced annually over forest land areas. The level of forest utilization has exceeded the rate of renewable forest resources supposed to be matched or fall below rate of resource supplies (Elroy, 2006).

Renewable characteristics of forest resources have failed to be achieved due to rapid degradation of natural capital in terms of forest to regenerate, while man-made systems and economical interest have been complicating deforestation through more intensive use of forest resources. Technological intervention through artificial forest development has been implemented insufficiently due to problem occurred on limited considerations on such developments and conservation and lack of social and political will. However, there are no other appropriate solutions to cope with problems occurred as argued by Loukola where "the best solution is probably to renew the resource itself and improvement of institutional framework and development approach adopting sustainable development.

4.4 Economic and Social Aspects of Forests

Forest resource has significant roles in the fulfillment of the basic need of people living in and around the forest. It refers to the improvement of the welfare and quality of life of people in terms of national income, employment, community participation and the existence of communities in terms of their customary rights

and properties and their involvement on the forest management activities. It refers to the fulfillment of the basic needs of people living in and around the forests.

4.4.1 Economic sustainability

Development of forestry sector is executed based on regulation and technical employed rather than on economical instrument which based market mechanism. It is conducted by putting price over forest resources; regulating access to forest concession, and intensification of timber processing. This is related to significant economic roles of forestry in national revenues and economic growth of society in terms of job opportunities improvement but lack of appropriate assessment toward forest timbers as indicated on broader functions.

Forestry sector has significantly become the activator of Indonesia economy for decades until currently just after oil, although there has been fluctuation of its contribution on National Gross Domestic Product[35]. Forestry sector has contributed to government revenues collected from DR, PSDH, Natural Forest Concession Fee, and Plantation Forest Concession Fee[36].

The simple skills and technology employed on forest utilization practices have been providing job opportunities for community in and around the forests on both natural forest concessions and plantation forest concessions. There are millions of people, especially on rural areas, who have been involved on forest concession activities. Furthermore, the similarity of forestry activities with agricultural practices by communities as their skills endowed from ancestors has promoted the acceptance of traditional communities to be involved in forest concession

[35] Department of forestry reported that during 1992 - 1997 there was resulting US$ 16.0 million of national earning with its contribution on Gross Domestic Product accounted for 3,5 % on average by exporting plywood, sawn timber pulp and paper, etc. Furthermore it was reported that in 2003 the export of forestry sector reached US $ 6.6 millions or 13.7 % of whole non-oil export. Cifor (2003) reported that it was calculated for about US $ 8.0 millions.

[36] Government revenues resulted from collection of Reforestration Fund, Forest Resources Provision, Natural Forest Concession Fees, Plantation Forest Concession Fee in 2003 were accounted for Rp. 2.72 billions.

activities, although limited skills and modality have impeded the more significant roles of traditional communities in such practices.

4.4.2 Social Sustainability

Within the decentralization era, based on Law No. 41/1999, there is acknowledgement of customary lands and laws which enable local communities to access forest resources within the framework of community desires. Public participations are approved not only toward economic access related forest but also social benefits through rights to receive good quality of environmental services, provide information concerning land uses, utilization of forest products, etc which emphasize on participation local policy-making processes.

Social functions of forest as implemented on the involvement of communities on forest utilizations, agricultural land provisions, and infrastructures and services developments. Participation of community on forest management is allocated on official governmental program through concession of community forest located either on productive, conservation and protection of forest areas within certain period of 35 years for wood and non-wood forest products. Related to agriculture land needs, there are program namely Tumpang sari[37] and Transmigration Industrial Plantation Forest. It allows agricultural practices on forest areas within concessions to intensify productivity of forest lands. Moreover in order to provide needs for infrastructure and services toward communities, usually on remote and isolated villages, in and around the forest conducted through Forest Village Development Program which requiring concessions to conduct infrastructures and services development plans.

[37] Tumpang sari is agriculture system implemented on the forest lands in order to intensify productivity of forest land by planting crop among forest trees. It is usually allocated for household working for concessionaires.

Due to the fact that most of communities are dwelling in and around the forest, forest plays important roles on poverty alleviation[38]. However such community development efforts conducted still can not address problems of structural poverty and structural absolute poverty[39] within abundant of forest resources. It affects on the lack of improvement of human capability in terms of income improvement and bargaining position toward concessions due to lack of skills, economical choices, facilities, etc. The program is also conducted on temporary and top-down approach which limits actively the participation of communities on the program. Moreover, the subsistence needs of communities and quick money are interfered in production and conservation of forest areas which in tropical rain forest are characterized by their dependences on forest.

For those reasons, the efforts to strengthen the capacity of local communities and its institutions must be prioritized on such programs based on the participatory method involving a wide range of stakeholder at various stages from policy formulation to review policy implementation.

The detailed description of forest utilization practices, in the principle of Human well-being is enhanced related to criteria of community empowerment for human well-being, within the perspective of sustainable forest management can be described on table 4.4.

[38] Wollenber stated that around 48.8 million of people live in the forest in which 10.2 millions of them are considered as paupers. The 20 millions of people who live around the forest are identified as dependent on forest for their subsistence (see. Mengapa Kawasan Hutan Penting Bagi Penanggulangan Kemiskinan di Indonesia).

[39] Structural poverty is defined as poverty caused by structure handcuffing of community to develop, while poverty absolute structure is defines as insufficiency of basic needs of community.

Table 4.4 The qualitative descriptions of forest utilization practices, in the principle of Human well-being is enhanced related to criteria of community empowerment for human well-being

No	Indicator	Targets	Description of Implementation	Impacts on Sustainability
1	Land tenure and property rights related to forest	To guarantee community land tenure and property related to customary laws and customary lands	Accommodating the establishment of proved community land tenures and properties. However there is no individual legal regulation determining customary lands.	Claiming over forest areas by communities that tend to be increase from time to time
2	Employment;	To develop community involvement in forestry activities	Only parties with strong modality can be involved, while local community only involve in daily work with no ensuring for work continuity	Significantly develops social aspects of forest utilization practices and industries in regions but less significant effects toward traditional communities
3	Investment	To guarantee the resilience of forestry businesses	Businesses gain significant economic benefit but less further investment attractiveness due to lack on continuity of business and permits	Forest management practices results economical benefit of forest but less forest resource sustainability
4	Contribution to national economy	To develop economic growth	Significant roles in national income, after oil, due to economic growth as main goal of development	Good impacts on economical aspects but exceeding capacity of forest industry over potency capacity of raw material supplies resulted from forest which leads to negative impacts on forest sustainability

4.4.3 Current Social and Economic Aspects of Forest Utilization within Sustainable Perspective

Sustainable principles of forest management seem less properly implemented especially in social aspects although it has been significantly enhancing economic aspects of forestry activities. It indicates imbalance of social aspects of

sustainability the concept of which is effectively stated on formal regulation but less implemented on fields.

Sustainable development requires more establishment of distribution of wealth on fields which permit the satisfaction of the basic needs of communities. It implies the needs for seeking for elimination of unjust, illegal forestry practices, inequality and poverty alleviation. There should be efforts related to self sufficient communities in and around the forests with acknowledgment of customary identity and enhancement of community empowerment both in decision making and development processes.

Furthermore, there is no adequate formal framework which effectively defines the existence of customary identity and property reflecting local community's existences. Customary legal framework is only attached on various sectors which are defined as legal format in order to seek formal concepts of sustainable development. The inclusion of social aspects on various sectors seems to reflect political formulation of public policies. Individual legal framework of customary existences seems to be more effective in order to impose social aspects of various sectoral activities. Participation is more seen as opportunities rather than rights of local communities which implicate not only on the formulation of formal regulation and public policies but also on development processes.

Chapter 5 CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

Formally, forest management in Indonesia has been adopting sustainable forest management as basis for forest utilization practices. However, the current forest utilization practices in Indonesia, within perspectives of sustainability, adopt neo classical model development imposing economic growth for economic benefit with limited implementation toward the other two aspects of sustainability. It is perfectly described by Nieto (1997) in which he argued that sustainability is an appendix on old conceptual predominant economic model of development which only immerge on theoretical world but is considered as to fail to be imposed in practical sustainability.

On the other hand sustainable forest utilization practices have inappropriately recognized the limit of natural capacity toward desired economic growth and human activities. It needs the recognition of the maximum capacity of natural processes in supporting economic and social developments which have to be maintained equally and under natural reproduction level. As consequences, these practices resulting in degradation of forest quality and quantity. It reflects the poor conception of justice which seeks for equal rights of intra and inters generations, environmental sustainability, and finally forest sustainability.

Currently, the paradigm employed in forest management, in decentralization era, leads to more intensive utilization in order to promote economic growth through timber production. The implementation of the concept of forest management is suffered from changing of institutional framework characterized by lack of local institutional capacity, although prior to centrally governmental system, there were also endangers toward sustainability, resulted from decentralization processes which lead to worse forest resource establishment and its productivity. The way to

view forest as resource for economic capital is ended with over exploitation of forest products with no consideration of capacity of natural process of forest system limiting forest ability to regenerate.

Even after several years of implementation of decentralization, there is insufficient evident stating that this transformation process results in more sustainable forest management which even complicated by institutional limitation and forest degradation and deforestation. Despite shortening span of control over forest management practices and insufficient centralized management and control of forest management, the efforts to decentralization of authorities toward forest is needed to be implemented.

Development approach which is merely based on economic growth has resulted in shortfall on policies and practices on the field often “reflect short time horizons” (Ascher, 2000) which is even much shorter than specific characteristic of forest management needed for long period of time marked on its biological time scales of renewal of resources. Current forest management practices tend to be disabled to maintain sustainability of forest product as indicated on well maintained level of timber harvested as basic requirement of sustainable forest management. The increase of timber production is initiated by level of timber demands determined by capacity of forest industries. The bottle neck is disability to manage the capacity of forest industry in accordance with capacity of forest resources to fulfill the demands of timbers.

Moreover, the efforts to support timber supplies through plantation forest development, although supported by funding incentive for its development and many concessions established, which in long term intended to replace roles of natural forest on timber supplies seem to be insufficiently performed. Furthermore, plantation development progress can not catch up with the level of natural forest degradation seemed to be more intensive. It is caused by limited

commitment, skill, forest threats which occurred during its development resulting in degradation of its concession and lack of plantation development progress.

Related to social aspect, the current forest management practices tend to leave the accommodation of traditional culture of forestry which is empowering communities in and around the forest to support forest management and improving social and economical aspects of community. The formal arrangements addressing community involvement and empowerment lack of effective implementation on the fields due to limited capability in terms of capitals and skills. Furthermore, legal framework of community empowerment is attached on every sector but no individual legal framework which effectively determines customary property and rights.

5.1.1 Forest Utilization Practices in Decentralization Era

Forest utilization in decentralization is characterized by more dominant roles of local authorities toward forest resources through decentralized forest administration. This roles have been significantly benefiting regions with abundant forest in order to gain local revenues, more accesses of local parties toward forest and community empowerment although there is still limitation on local governance.

The application of decentralization changes relationship pattern between central and local authorities while de-concentration agencies are replaced by regional sector department with municipality level of governments to become the centre for autonomous authorities. However, in decentralization processes, there are still different perceptions of authorities related to decentralization between local and central government resulting in the struggle for power and uncertainties especially over natural resource administration including forest. The different perception toward decentralization results in overlapping and emptiness of roles and responsibilities between level of government and sectors.

5.1.2 Forest Management within the Perspective of Sustainable Forest Management

Forest management practices within decentralization era seem to enhance such practices prior to this era indicated by more intensive of forest utilization. The economic interest of forest utilization seems to be still dominating forest management and less consideration on social and environmental aspects of sustainable forest management. Sustainability will not be achieved as long as no balanced of three aspects of sustainability can not be established. Current Indonesian forest management is in the process of diminishing the forest existence due to natural disability of forest to regenerate toward climax forest as requirement of sustainable forest condition and lack of human efforts for such development and improvement.

Forest management has failed to manage forest utilization within the framework of sustainability requiring timber extraction within the capacity of natural process of forest to regenerate. Natural process occurred on forest management actually has to be basic consideration on economic interest toward forest, meaning that there are needs for determination of maximum capacity of forest to provide economic growth. However market forces has been imposing current forest management practices to adopt short-term vision of forest utilization for economic growth but lack of long term consideration intergeneration perspective of forest management.

5.1.3 Trends of Forest Management Practices

Within the decentralization forest, identified as more intensive than prior to centralized era, resources have become vehicles for economic development in Indonesia with positive impacts on regional earning, job opportunities. This trend is stimulated by the efforts conducted by regional government to secure their financial support for development. It is conducted by intensification of fee and taxes over forest resources.

The high installed capacity of forest industries have been menacing sustainability of forest through over exploitation of forest mainly based on natural forests. It is indicated by exceeding demands for timber compared to capacity of forest to supplies worsened by inefficient production process and less competitive industries. This condition has been worsening by crisis stimulating request of decentralization from regions which results in economical, social and environmental problem.

Social and Economic Aspects

Forestry sector has significant roles in social aspect indicated on related community on socially and economically forestry activities. The dependences on forest can be in the forms of tangible, namely timber and non timber, and intangible (social function) namely ecological conditions: water, job opportunities, etc.

The approach of development which adopts economic growth has been imposing national social and economic activities related to forest resource. Among other sectors, forestry sector is considered as second sector, after oil and mining sector, which contribute to national revenues. Forestry sector has been significantly generating Indonesia economic for decades and contribute to National Gross Domestic Product and government revenues.

The existence of communities around the forest living for generations indicates the social function of forest and its existence but the existence of customary communities have not been accommodated properly both on regulations and practices. Efforts to empower communities, especially community dependence on forest, have not resulted in significant impacts although there is a need for urgent community participation in order to support forestry development.

5.2 Recommendations

In order to achieve sustainable forest management, there is need for new paradigm on forest utilization based on resource (resource-based management) which emphasizes on forestry development based on benchmark of forest potency followed by calculation on social and economic development by providing access toward forest for all related parties. As response to requests for decentralization, this transformation can be implemented gradually by considering current capacity building of regional institutions which, in the mean time, also improve its capability toward desired decentralization.

Forest resource managements, with its specific characteristics, slow process and finite carrying capacity, have limited resilience toward the adoption of weak sustainability which is mainly based on human needs and technological beliefs, but there are needs for strong sustainability which ecological systems as centre of concern. Therefore, there are needs for decision making and development processes which enhance integrated sustainability in terms of environmental sustainability, social justice, and appropriate economic development.

Sustainable forest utilization needs efforts addressing the strong sustainability approach which gains economic benefit under or within natural capacity without risk of its declining. Furthermore, it seeks for future condition which maintains living standards and prevention on tragedy of commons. It means there is improvement on the investment of natural capital and arrangement of human interventions. Mc Elroys (2006) argues that public policy, under uncertainty, needs decision making approach which maximize expected utilities of economic activities and precautionary principle of environmental conservation.

In regard to ineffective centralized management and monitoring of forest management, decentralization is considered as a compulsory action which has to be taken. However, decentralization process conducted related to local authorities

toward forest has to be implemented gradually, implemented within sustainable forest management perspectives, and based on local authority capability under assistances and monitoring of central authorities within certain period of time.

In line with decentralization and market intervention, forest management has to be followed by improvement of institutional constrains respecting environmentally sound of relevant parties in order to have more balance of sustainability aspects of forest management. It includes among others the enhancement of law enforcement related to forest management, local and central authorities relationships, and cleared mechanism of shares of revenues toward natural forest harvested.

As response toward current issues, therefore there is a need for shift of paradigm on forest utilization from economic growth based management to forest resource-based management. This approach will significantly change the current forest management policies and practices which lead to the diminishing of economic interest toward more ecological aspects. There is theory of Liebig with the fewest component of environment determining maximum carrying capacity[40] which in this case technology can not support human efforts for desired intensifications.

In relation with social roles of forest the appropriate social approaches are needed to cope with unfairness of assessment toward forest and assessments and insecurities of forest resources have to be conducted through the acknowledgement of customary existence, improve their roles and participation, and maintains traditional relationship between customary communities with forest. The acknowledgment of customary rights and community in and around the forest has to be actualized on the fields by establishing specific programs under government and NGOs assistances and funding provisions relevant with criteria and indicator of social aspect of sustainability of forest management.

[40] An environment's carrying capacity is its maximum persistently supportable load (Catton, 1986) at http://dieoff.org/page110.htm, July 2006.

5.2.1 Effort to Develop Legal and Institutional Framework

By considering current forest utilization practices there are needs for efforts to be conducted in order to formulate policies and regulation that support forest management based on its carrying capacity. Effectiveness of this policy has to be supported by field officer integrity and consistencies of law and regulations.

Gradual delegation of authorities in forestry sector can be implemented by considering capacity building of regional institutions, in order to diminish higher impacts of forest degradation. The central government has to provide precondition of forest management decentralization by conducting assistances and monitoring of forest management implemented in regions. Effectiveness of forestry administration has to be improved through integration and harmonization of authorities and responsibilities among level of authorities to cope with overlapping or emptiness of public administration.

Forestry planners are needed to be actively involved in political efforts either with politics, inter sectors, and level of public authorities to the establishment of forest areas. Also there is a need for synchronization of forest areas with regional spatial planning both in provincial and municipal level (i.e. ***RTRWP and RTRWK***).

Social function of forest has to be improved by establishing explicit legal framework especially related to acknowledgement of customary laws and communities. There are needs for legal and institutional framework imposing customary property and rights related forests which are effectively implemented on the fields. Therefore, the clear separation over forest resources under the state and customary communities are needed to be formulated.

The policy of soft landing is needed to be promoted by down sizing demands of timber through restructurization of forest industries with consideration toward maximum capacity of forest to supply timber which have to be a compulsory. In

the mean time, we need to promote development of plantation forest over current concessions by providing such effective incentive and punishment, such as amenity of licensing for such development and repeal of concessions for such silviculture violation, in order to support timber supply sources.

Restructurization of forestry sector is needed for the establishment of policy and regulation on the fields, especially related to encroachment of illegal logging and illegal forest conversions, the establishment of forest areas and restructurization of current forest industrial capacity relevant with current forest capacity to supply.

5.2.2 Effort to Securing Forest and Continuity of Timber Supplies

The existence of forest areas are basic condition for forest resource based security conducted by the establishment of permanent and definitive forest areas functioning as productive areas allocated and are based on agreed relevant parties. Further efforts needed to be conducted are both to diminish and prevent further forest degradation and deforestation, illegal logging, forest fires, etc and promote the improvement of forest conditions and possible opportunities for accretion of forest areas. It can be conducted through acknowledgement of forest areas (based on TGHK and RTRWP) respected by local and regional parties taking significantly taking significant roles toward forest establishment.

Security of forest areas will be maintained after the establishment of synchronization with provincial and municipal spatial planning through TGHK and RTRWP while the exceeding demands of timbers responded by soft landing policy[41] has to be followed by calculation of exact capacity of forest to produce timber based on defined productive forest functions on both natural forest and plantation forest areas.

[41] Policy aimed to give time for natural forest to grow and reach climax forest. This policy is implemented by declining cutting quote by province, based on sustainability forest resource, and is determined based on Ministry Decree.

Forest management practices are needed to be improved in order to enhance forest performance by conducting appropriate standard and monitoring of sustainable forest management, redesigning forest utilization institutions, and acceleration of plantation forest, and relevant level of industrial capacity adjustments. .

5.2.3 Community Empowerment and Human Well Being

Related to access toward forest customary community is supposed to defined as "local commons" (Ascher,2000), not for global commons, which are only limited on selected groups who live close to the resources. The distribution of benefit from forest has to be prioritized to communities around the forest in order to conduct community empowerment and economic development in order to improve welfare. It can be implemented by providing them with a better access toward forest through improvement of their roles as significant stakeholder and involvement on forest management and economic forestry activities. The improvements of quality of life of community around the forest will in turn secure the forest existence and establishment and promote forest sustainability. The abundant forest resources have to be in good comparability for Indonesia to develop forestry sector to be more sustainable manners.

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