Appendix 3

Indonesia Country Review:

Reduction Emission from Forestation and Forest Degradation and Sustainable Development in Indonesia

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1. Introduction

Indonesia is one of the world's forest-rich countries. Based on vegetation map of Indonesia (Hannibal, 1950), nearly 84 percent of Indonesia's land area was covered mainly by primary and secondary forests. The forest area is defined by its function and use, i.e. conservation forest, protection forest, limited production forest or production forest. Part of the production forest is convertible. These forests have been used for many generations by the communities living in and near them. Since the 1970s, the government too has used them more extensively to contribute to national economic development through State-owned and private companies. This has made the forestry sector one of the most important contributors to Indonesia's economy over the last three decades. Before, the monetary crisis hit Indonesia and many other Asian countries in 1997, the forestry sector was contributing about US$20 billion/year, or about 10 percent of total gross domestic product (GDP) (ITTO, 2001).

At present about 30 million people depends their livelihood on Indonesia's forests. However, in the last three decades little it has been done to develop rural areas or improve the livelihoods of people living in and near forests. This is mainly due to the overwhelming problems of unclear land tenure and local communities' lack of participation or involvement in the management and use of forest resources. After the fall of the New Order regime in May 1998, Act No. 22/1999 and Government Regulation No. 25/2000 gives more authority to local (provincial and district) governments, triggering autonomy euphoria all over Indonesia. Issuance of Forestry Act No. 41/1999, which superseded Forestry Act No. 5/1967, marked the onset of reformation in the forestry sector. However, neither this new act, nor the other natural resource regulations issued in the last five years is in favor of local communities. Some individuals and groups have taken advantage of the ambiguity of the laws and regulations to abuse the system, leaving the majority

of local communities still insecure over the ownership of land and natural resources (Simorangkir and Sardjono, 200?).

The above condition exposed Indonesian forest into serious degradation. High rate of deforestation due to rapid development and increase land demand for agriculture activities, and forest degradation due to illegal logging activities have been observed in many part of Indonesia, particularly in the islands of Sumatra and Kalimantan. This problem brought Indonesia to be one of developing countries with significant contribution to the global GHG emissions. In response to this situation, Government of Indonesia has issued a number of policies that can lower deforestation and forest degradation. Among others, some policies are creating incentive and disincentive mechanism for local government in managing their forests, law enforcement for forest fire prevention and controls, strict rules in peat land management and implementing REDD (*Reducing Emission from Deforestation in Developing Countries*).

This paper highlights deforestation and forest degradation problem that cause serious threat to future Indonesian economic development, and dilemma faced by the country in managing its forest resources. In the later sections, it describes key policies and programs on forest management focusing on REDD and factors that may cause the ineffective or inappropriate implementation of the policies and the programs.

2. Deforestation and forest degradation

The rapid increase of use of forest resources for livelihood and development puts Indonesian forest under serious decline. Throughout Indonesia, forest clearance began in the lowland areas, where topography and soil fertility were most favorable to human settlement and agriculture. In 1970s and 1980s forest clearance also occurred for plantation and transmigration program as well as commercial logging. However, It is difficult to get good estimates of forest clearance. Different studies provided different estimates (RePProt, 1990; Hannibal, 1950; Intag, 1990; MoF, 1998, 2000, 2001 and 2002; FWI and GFW, 2001). However, based on these studies the average annual reduction in forest area over the last 50 years fluctuate around 1.8 million ha reaching a peak of about 2.8 million ha during the years 1997-2000. Based on linear regression analysis, an average annual reduction in forest area is about 1.4 million ha per year (Figure 1).

Figure 1
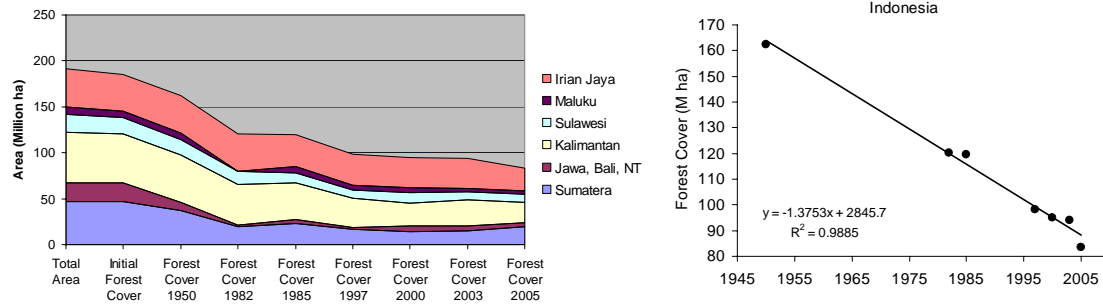
Source: Rate of deforestation in Indonesia (Developed based on data from RepPort, 1990; Hannibal, 1950; Intag, 1990; MoF, 1998, 2000, 2001 and 2002; FWI and GFW, 2001, MoE, 2005, and from BAPLAN in Sugadiman, 2007)

Recent study conducted by Kauppi et al (2006) using data from the Global Forest Resources Assessment by the United Nations Food and Agriculture Organization (FAO, 2005), in addition to rapid rate of deforestation, excessive logging also causes Indonesia forest under serious level of degradation. Among the 50 nations, Indonesia has been found to be a country with the largest degradation rate (Figure 2). Rate of deforestation is also higher like other developing nations with rate of about 1.7% per year (equivalent to 1.87 Mha per year).   However, based on new analysis conducted by Ministry of Forestry in collaboration with SDSU (South Dakota State University) using MODIS, it was suggested that rate of deforestation in Indonesia is lower than that reported to FAO under FRA2005.   In the period of 2000-2005, the average deforestation rate declined to only 0.72 million ha per year or about 0.65% per year (Figure 3;). However the rate is increasing from year to year.   In 2000-2001 the rate of deforestation was only 220 thousand ha and in 2004-2005 it increased to 1,182 thousand ha.   The most rapid deforestation was in Sumatra and Kalimantan.

Figure 2. Changes in forest cover and forest density during 1990–2005 in the 50 nations
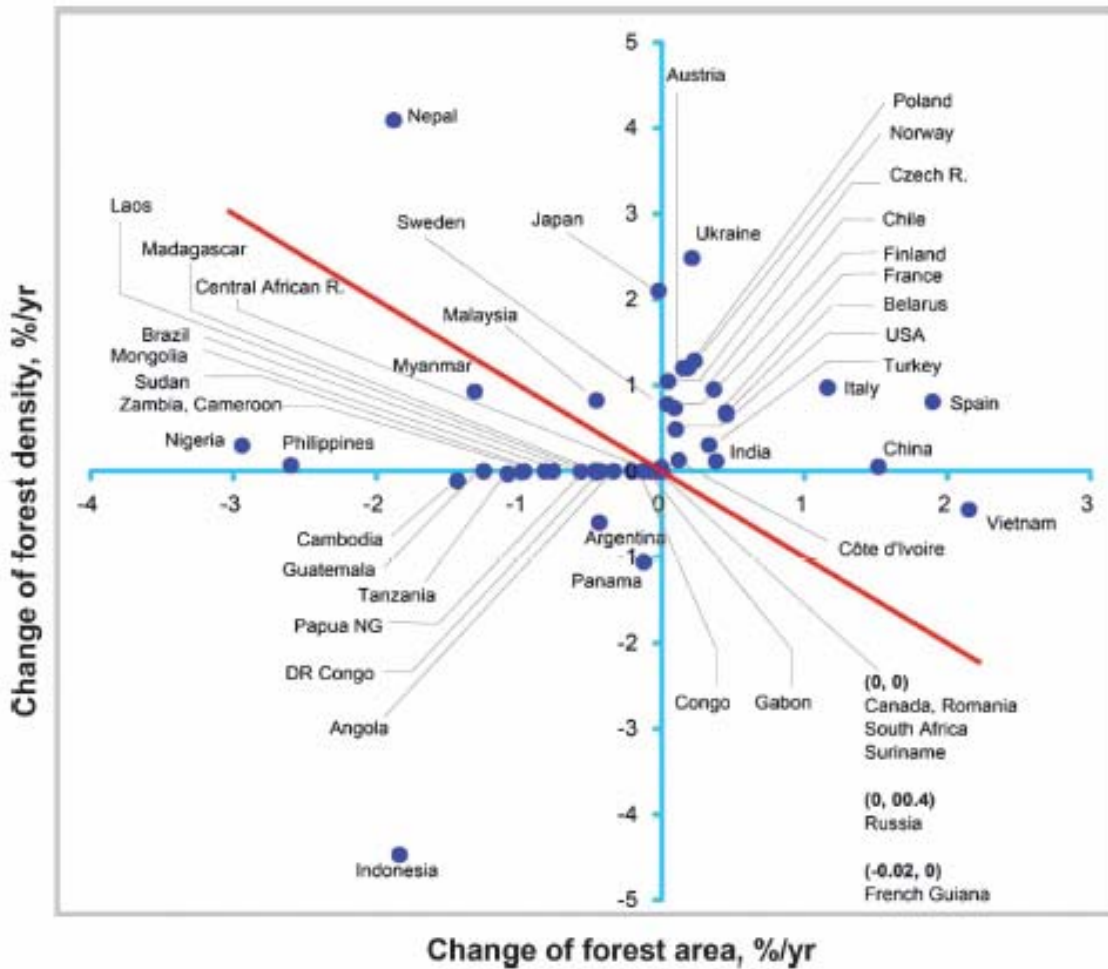

Source: Kauppi *et al.*, 2006

Many studies suggested that deforestation rate is strongly correlated with population density, with the correlation increasing with the number of rural landless families (Ludeke et al. 1990; Reis and Margulis (op. cit.), 1991; Adger and Brown 1994; Harrington 1996; Sisk et al. 1994; Kaimowitz 1997; Ochoa-Gaona and Gonzales-Espinosa 2000). However in Indonesia, the decreasing rate of forest cover with population density varied considerable between islands. The highest decreasing rate occurred in Irian Jaya, Kalimantan, Sulawesi, Maluku and Sumatra. While in Java it already entered transition period. The Forest area expanded in late 1990s, whereas population grew although slowly (Figure 4).

Figure 3.   Annual rate of deforestation by island during 2000-2005 using MODIS data
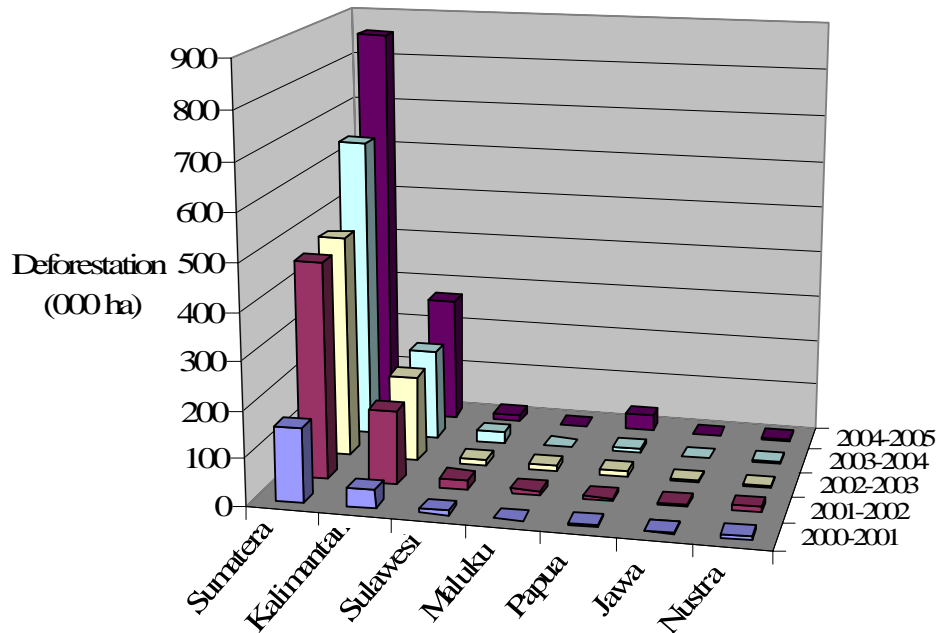
Source: Developed based on data from BAPLAN in Sugardiman 2007

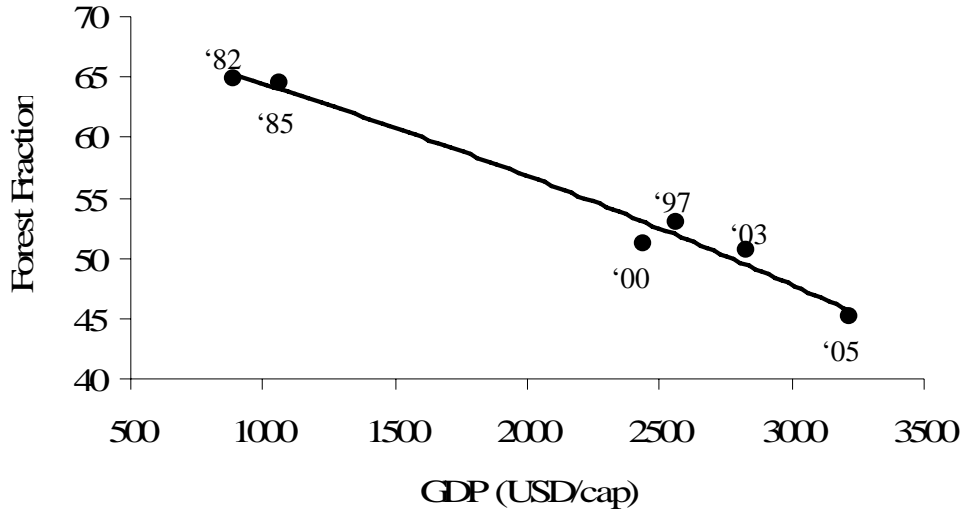Figure 4.   Relationship between forest fraction and population density by island
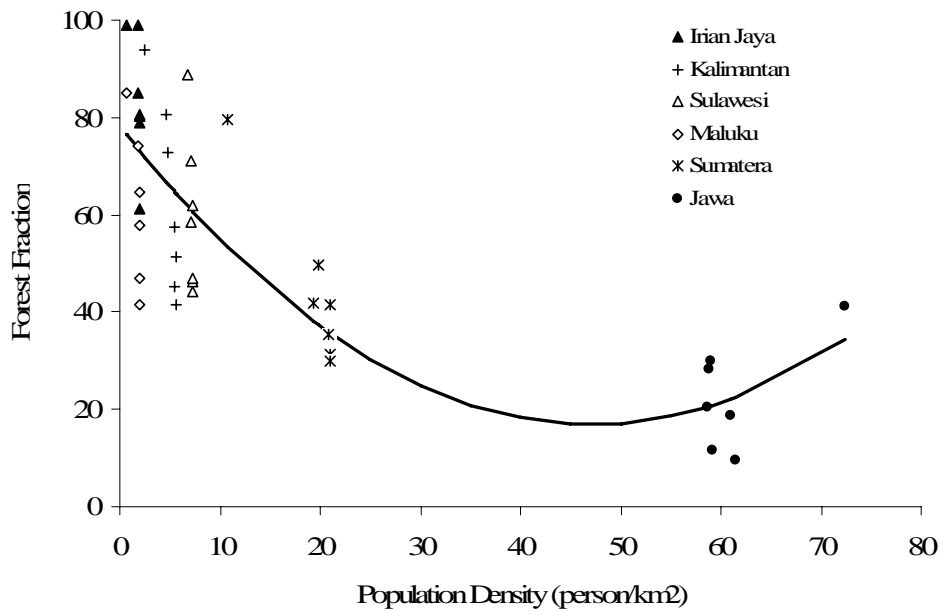
Source: Developed based on data from RePProt, 1990; Hannibal, 1950; Intag, 1990
MoF, 1998, 2000, 2001 and 2002; FWI and GFW, 2001, and BAPLAN in Sugardiman,
2007; Population Data from BPS)

Rapid decreased in forest cover in islands outside Java with slight increase in population density was due to large conversion of forest area for agriculture plantation, particularly to palm oil. For example, more than 1.1 million ha of oil palm was planted in Riau (Sumatra) alone during the period 1991-2005. Another 438,199 ha was planted in South Sumatra, 429,099 ha in North Sumatra and 394,945 ha in Jambi. In 2004, the government announced that it would establish a million hectares of oil palm in Kalimantan. Recently the government also plans to develop a Mega oil palm project on the border between Kalimantan and the neighboring Malaysian states of Sarawak and Sabah. But the program was cancelled after a number of NGOs protested against the plan. A new regulation (PP 26/2007) now offers investors the opportunity to establish up to 200,000 ha of oil palm plantations in Papua[1].

The prolific growth of the oil palm sector has conferred important economic benefits. Palm oil has become a valuable source of foreign exchange and employment. In 2005, oil palm industries employed around 1.86 million people and exported about 10.3 million tonnes of palm oil bringing in earnings valued at $3.75 billion. As contribution of agriculture sector to national GDP is quite significant, the reduction of forest cover has been found to be significantly correlated with the increase in GDP (Figure 5). Based on data from the 50 nations (see Fig. 2), Kauppi et al. (2006) found that the forest transition period started to occur when the GDP was more than 4,600 USD/cap.

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[1] Menteri Pertanian PP 26/2007 tentang Pedoman Perizinan Usaha Perkebunan.

Figure 5.   Relationship between forest fraction and GDP in Indonesia

Source: Developed based on data from RepProt, 1990; Hannibal, 1950; Intag, 1990; MoF, 1998, 2000, 2001 and 2002; FWI and GFW, 2001, and BAPLAN in Sugardiman 2007; and data on GDP based on purchasing-power-parity (PPP) per capita are taken from http://www.indexmundi.com/indonesia/gdp_real_growth_rate.html)

High rate of forest degradation occurred mainly in production forest due to high illegal logging activities.   This condition was triggered by the high dependence of the wood products industries on logs from the natural forests and many poor people live surrounding forests (about 50-60 millions people) with little land and few options for maintaining livelihood.   World Bank estimated that the lost of revenue due to illegal logging activities reached USD1500 million per annum.   In 2002 the Secretary General of the Ministry of Forestry,   Wahyudi Wardoyo,   gave a figure of $600 million per annum.   High rate of deforestation and forest degradation have caused many watersheds throughout Indonesia becoming critical.   About 52.3 Mha has been prioritized for rehabilitation (Figure 6).   Most of them are located in Kalimantan and Sumatra.

Figure 6.   Area of critical land and degraded forest prioritized for rehabilitation program


26,4 Mha   19.9 Mha   26,8 Mha   12.0 Mha
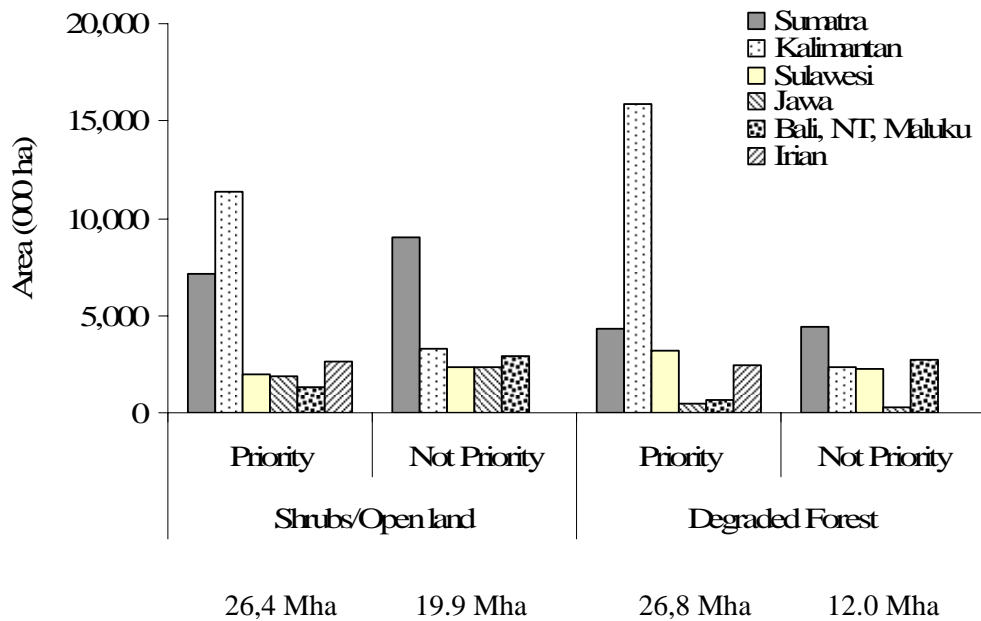
Source: based on data from the Directorate of Land Rehabilitation of Social Forestry Ministry of Forestry

3.   **Reducing rate of deforestation and forest degradation**

As indicated above, high rate of deforestation and forest degradation have created many critical watersheds.   In 1984, number of degraded watershed was only 22 watersheds, in 1992 it increased to 40 watersheds and in 1998 it increased further to 58 watersheds.   In Java, between 1992 and 1998, number of degraded watershed increased rapidly and after 1998 some of these degraded watershed have been restored (Figure 7).   Degradation of forest cover in the main watersheds increased the risk of flood and drought.   Flow data from 52 rivers across Indonesia showed that number of rivers in which the minimum flow potentially caused drought has increased significantly.   Similarly, the number of rivers in which the peak flow potentially caused flood also increased significantly (Figure 8).

Figure 7.   Number of degraded watersheds in Indonesia by islands
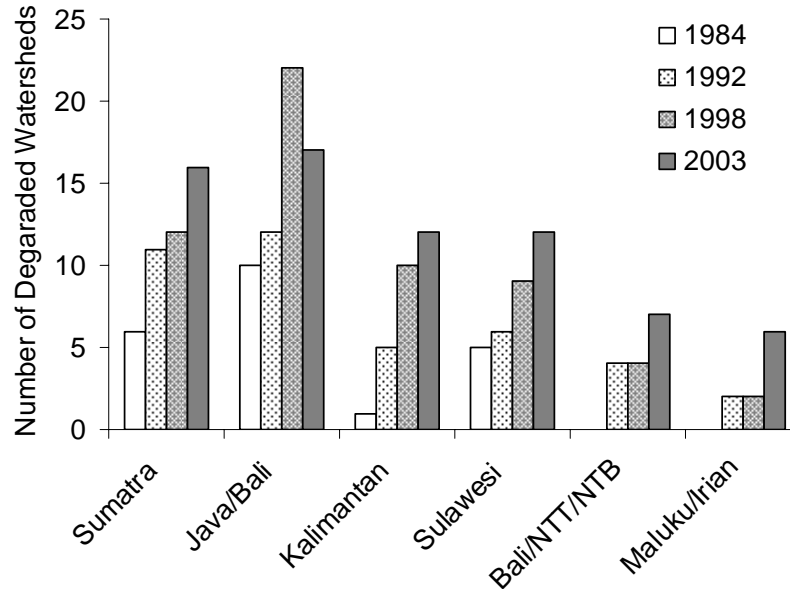
Figure 8.   Percent of rivers which have minimum and peak flows that potentially cause drought and flood problems in Indonesia
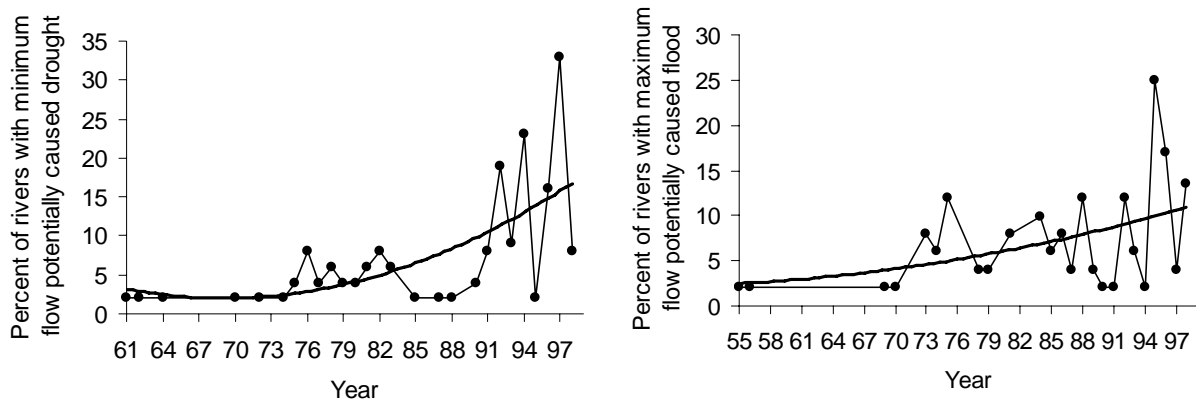
Degradation of forest cover in the main watersheds has exacerbated the impact of extreme climate events.   For example, in the El-Nino year 2006, the water level in Jatiluhur, the main dam of West Java at Citarum watershed, has fall much below the water level of the dry scenario (Figure 9).   This has serious impact in many sectors.   The shortage of water in the reservoirs and rivers will influence the availability of drinking water, especially in urban/metro areas.

Under extreme dry years, the water level at Jatiluhur Dam could go down to a level of less than 75 m.   Under this condition, the water pump at the dam can not be operated and supply of water to the processing plant will stop.   Many or irrigated rice field also could not get water, causing huge drought area.   .

Figure 9.   Change is water level of Juanda Dam in El Nino 2006
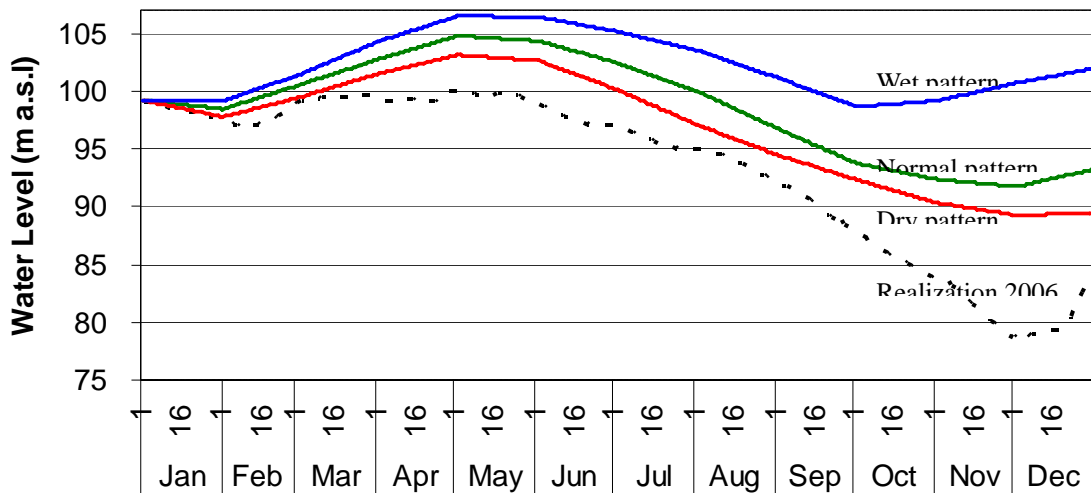

Source: Data from Ministry of Public Work, 2007. (Similar patterns were also observed in other El-Nino years.)

Many reports showed that crop failures due to severe drought affected community income seriously.   In main rice crop production area such as Indramayu for example, during El-Nino of 2003 huge rice production loss caused a significant increased in a number of poor farmers. During that year, number of household that could not meet their food basic needs increased by 14% (Boer et al., 2004).   Similarly in Central Sulawesi, the drought occurrence during that year pushed farmers to reduce their expenditure for food by about 40% and also others (Figure 10).   In East Nusa Tenggara, the reliance of farmers to government aid tended to increase during extreme drought years.   In El-Nino 2006/2007 for example, most of income sources of the poor come from government aid ('bantuan pemerintah'; Figure 11).

On the other hand, in extreme wet years, the flood will damage the processing plant and contaminates the water.   Floods occurred in February 2007 have caused damage in the production installation which amounted to about 2.2 million USD.   Heavy rainfall also increases the turbidity and this will increase the cost of water processing.   Current technology for water processing is still conventional and it can tolerate the turbidity of between 500 and 2000 NTU.   Under emergency, the plant still can be operated even though the turbidity has

increased up to 8.000 NTU, but the cost for the processing will increase significantly.   If the turbidity goes beyond 8,000 NTU, the plant can not be operated (Boer et al., 2007).

Figure 10.   Percent of household that reduce their expenditure during El-Nino years 2002
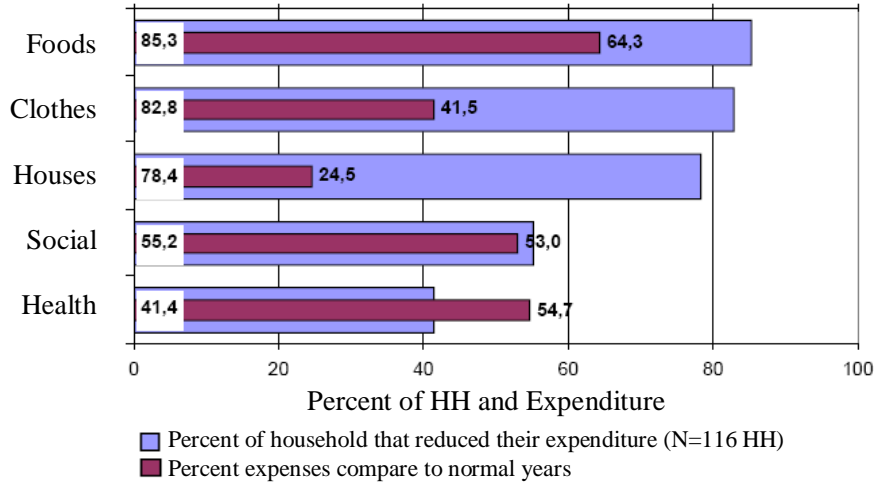
Source: Impenso Project, 2008

Figure 11. Source of income of farmers at Timor of East Nusa Tenggara Provice in 2006/07 El-Nino.
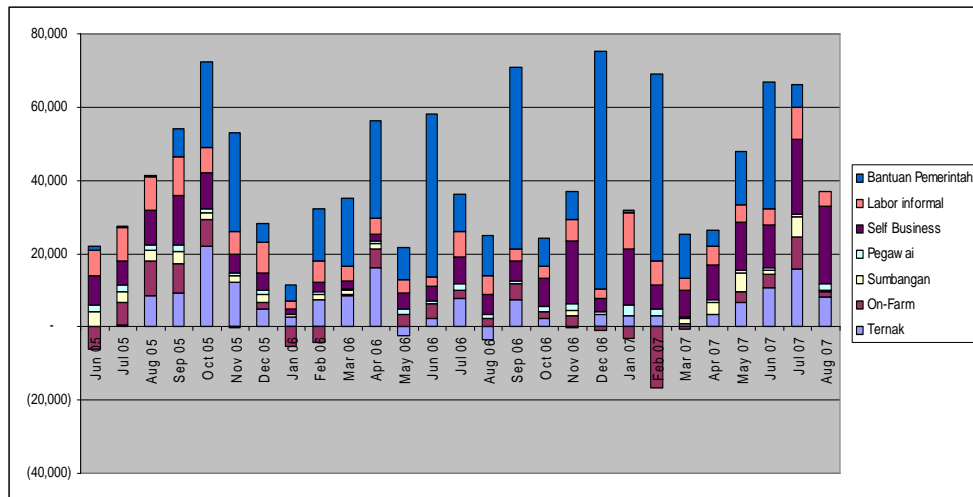
Source: Kieft (2007)

As high rate of deforestation and forest degradation has direct and indirect negative impact on many sectors and also put Indonesia as one of significant contributor countries to global GHG emissions, Government of Indonesia (Ministry of Forestry) has set up progressive target to rehabilitate critical land and degraded forest.   The programs include enhancing carbon

sequestration (rehabilitation of degraded land), avoiding deforestation and forest degradation and combating illegal logging and forest fires (Figure 12). Carbon market and the new global mechanism, which is currently being negotiated in the framework of the UNFCCC to finance the reduction of carbon emissions linked to deforestation in developing and emerging countries (REDD), have been considered to be one of potential mechanisms that can assist the country to achieve such progressive target. REDD offer the prospective to optimize the existing potential of Indonesia's tropical forests and to revitalize forest industries. It also can conserve biodiversity as well as indigenous and rural people.

Figure 12. Target area for implementing land rehabilitation programs, avoiding deforestation and degradation and combating illegal logging and forest fire
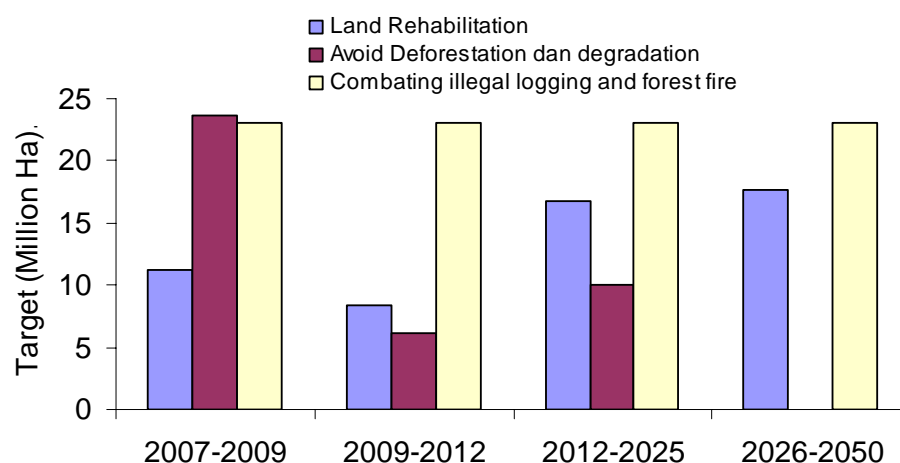
Source: SME, 2007

4. National Policies for reducing deforestation and forest degradation and land rehabilitation

Many policies and programs already exist to reduce deforestation and forest degradation. For example, regulation on restoration of production forest ecosystem (SK 159/Menhut-II/2004), control of illegal logging (Inpres 4/2005), control of forest fires (KepMenut 260/1995), ban of using fire in land clearing (PP4/2001) and many others. Five priority programs described in Forestry Strategic Plan for 2005-2009 under the Ministerial Decree Number P.04/Menhut-II/2005 are closely connected with avoiding deforestation and forest degradation. The five programs include

1. Combating illegal logging and its associated trade by securing forest areas and controlling on forest product administration;

2. Revitalization of forestry sector, particularly the forestry industries through restructuring the primary forestry industry, accelerating the establishment of plantation forest, implementing sustainable management of primary production forest and improving the management of natural production forest management which under non-concessionaire license.

3. Conservation and rehabilitation of forest resources, through the development of plantation seeds, management of watershed areas, rehabilitation of forest and land, self management of forest and land rehabilitation, development of national park management, management of nature preservation/sanctuary reserve/hunting park areas, controlling of forest fire, management of biological diversity, management of protected forest, and utilization of wildlife and plants products and environment services.

4. Empowering the economic of the community within and surround the   of forest area by giving more access to forest resources such as development of community forest and community plantation forest, development of NTFP utilization, development of buffer zone area surround the conservation areas, and development of social forestry.

5. Stabilization of forest area for promoting and strengthening the sustainable forest management.   The activities include inventory and mapping of forest resources, development of information assessment system on forestry development, gazettement of forest area, preparation and evaluation of the utilization and conversion of forest area and development of Forest Management Unit.

Serious efforts have been conducted by the governments for rehabilitating the degraded forest and lands.   Timber estate plantation that had been developed since 1989 was 3.65 Mha, while degraded forest and lands being rehabilitated through regreening, reforestation, mangrove restoration, agroforestry (community forest) and private forest since 1969 was 9.9 Mha (Figure 13).   However, the survival rate was very low (between 10% and 50%).   Refer to government target for land rehabilitation, total area that will be rehabilitated in the next 40 years (2007 to 2050) will be about 50 Mha (see Figure. 10) or about 1.2 Mha per year.   This target is very progressive since as it almost four times of the planting rate done in the period 1969-2006 (0.36 Mha).   If the source of funding comes from national budget only, this target is impossible to be achieved.   Therefore, government of Indonesia will seek alternative fund from various sources such as bilateral, multilateral funds and carbon fund.

Figure 13.   Land rehabilitation program done in the period 1969-2006
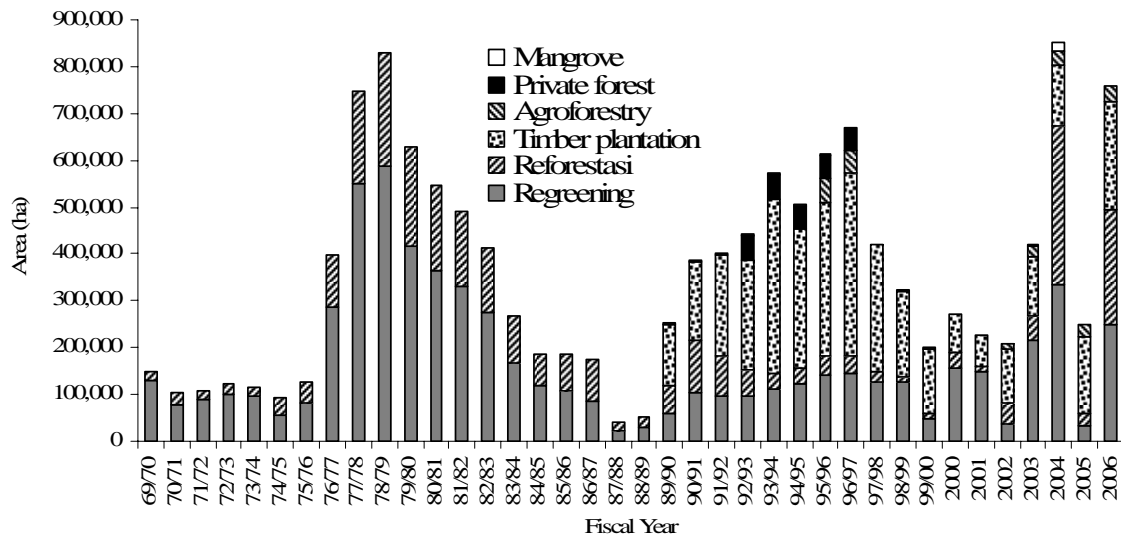
Source: Based on data from Ministry of Forestry

In addition, Government of Indonesia is now in the process of developing strategies to implement REDD.   Many international agencies has put support for Indonesia to prepare the implementation of REDD.   Some of international support programs on REDD is given in Table 1.

Table 1. Some of key International support program related to REDD in Indonesia

No.	Title/Donor/Duration	Objectives
1	Cooperation to Support Forest Governance and Multistakeholders Forestry Programme (UK, 2007-2010)	1. Support governance reforms to reduce and eventually eliminate illegal logging and its associated timber trade, with a particular focus on support to negotiation and implementation of the EU-GoI FLEGT VPA and other international arrangements; 2. Through a multistakeholder approach, help build capacity of central and local government and civil society, support partnerships between government and civil society, promote policy analysis and development, and support poverty reduction through more equitable and sustainable management of natural resources, with a particular focus on the rights and opportunities through community forestry for disadvantaged and women's groups; 3. Explore the opportunities for governance reforms that are necessary for Reduced Emissions from Deforestation and Degradation (REDD).
2	Financial Cooperation / FC Untuk kegiatan Issue Climate Change dan REDD Dengan judul FORESTRY-CLIMATE CHANGE PROJECT IN CENTRAL AND EAST KALIMANTAN (German, 2009-2015)	**Overal Objective**: To support Indonesia with the reduction of Green House Gases (GHG) emission (mitigation) from deforestation and degradation. **Specific Objective**: 1. To support priorities policy of Ministry of Forestry in REDD 2. To support the implementation of mechanism related to avoiding deforestation by development of pilot projects in Indonesia with the involvement of local communities in sustainable forest management
	Technical Cooperation / TC Supporting implementation of Ministry of Forestry's	To implement of strategic plan which is integrated and synergized with other sector planning, in particular provincial and districts programme

	strategic plan (German, 2008-2010)	
	Technical Cooperation Forestry Program in Implementing The Heart of Borneo Initiative (German, 2008-2010)	Objectives : 1. To establish trilateral, national and local (states, provincial, and district) institutional arrangement to support the implementation of the HoB Program 2. To develop mechanisms, including inter alia, action plan at all levels, on yhe implementation of HoB program. 3. To strengthen capacity of stakeholders related to the implementation of HoB programs.
3	A Program of Bilateral Cooperation to Reduce Greenhouse Gas Emissions Associated with Deforestation in Indonesia under the Global Initiative on Forests and Climate (Australia, 2007-2012)	The goal of the program is to support GOI efforts to reduce greenhouse gas emissions associated with deforestation in Indonesia, through action to reduce rates of deforestation, support reforestation and promote sustainable forest management, delivering improvements in rural livelihoods and environmental benefits.
4	Korea-Indonesia Joint Program on Adaptation and Mitigation of Climate Change in Forestry through Afforestation and Reforestation Clean Development Mechanism (A/R CDM) and other Related Mechanisms (Korea, 2008-2012)	1. To acquire cost-effective potential A/R CDM sites and to establish foundation for carbon credits in preparation of post-2012 emission commitment - Site survey on potential CDM sites - Collection of information to establish forest sink measures for post-2012 reduction commitments by identifying profitability of CDM plantation projects - Analysis of land-use change by applying remote sensing (RS) - Forest resources assessment and forest carbon stock estimates 2. To analyze REDD application, one of the key issues in international climate change discussions, and to acquire framework in carbon credits by preventing forest conversion as a post-2012 preparative measure - Assessment of forest resources, land-use status including r

		ate of forest conversion, changes in carbon stock
		- Analysis of forest conversion and forest degradation drivers
		- Effectiveness of incentives for preventing forest conversion and forest degradation
		- Development of measures to interlink incentive programs with the sustainable development policies on the national/local level
		3. To implement capacity building programs including expert exchange and training courses
		- Development and exchange of A/R CDM and REDD experts
		- Capacity building of related professionals in the host country
5	Accountability and local level initiative to reduce emission from deforestation and degradation in Indonesia (ALLREDDI; DFID, 2009-2011)	Overall objectives to assist Indonesia to account for land-use based greenhouse gas emissions and to be ready to use international economic 'REDD' incentives for emission reduction in its decision making at the local and national levels Specific objectives: 1. Developing national carbon accounting system that comply with Tier 3 of the IPCC guidelines for AFOLU (Agriculture, Forestry and other land uses), completing and maximaing existing efforts; 2. Strengthening national and sub-national capacity in carbon accounting and monitoring, and 3. Designing operational REDD mechanisms in five setting for REDD

Source: Directorate of Foreign Cooperation, Ministry of Forestry

5.   The problem from implementation of existing relevant national policies

One of the main problems affecting the effective implementation of existing national policies particularly the one related to reduction of deforestation is decentralization.   Local governments have been granted autonomy after the government reform to manage their territories.   This to some extend has created tension between the use of forest land determined

by the central government and the need for the release of more land to local government. The problem is that local governments have authority over land use planning but they do not have direct access to decisions related to the release of forest land.

On the other hand, the issuance of Act No. 26/2007 on Spatial Plan Regulation (*UU Penataan Ruang*) and Act No. 41/99 on Forestry (*UU Pokok Kehutanan*) state that the total forest area that must be maintained is at least 30% of the total area of the watershed and/or island considering the condition of the ecosystem. These regulations encourage the districts to propose to the Ministry of Forestry to release some of the forest area to become non-forest area which is called as APL (*Area Penggunaan Lain or Non Forestry Kawasan Budidaya non-Kehutanan*). At present there are about *538* proposals from districts to the Ministry of Forestry to release more of forest land as APL. Recently the Ministry of Forestry agreed to release some of forest land to become APL for all districts on Kalimantan.

The introduction of REDD into Indonesia provides the opportunity for local government to earn income from maintaining their forested land through re-examining their spatial plan, i.e. to reconstruct them and to ensure that there is the greatest level of harmony possible between the functional land use zoning that is required under local government spatial planning and the functional land planning and management of forest areas within the Forest Estate.

Government of Indonesia just issued an act which requires local governments to progressively revise their spatial plans (Act 26/2007). On the other hand, the existence of the Government Regulations PP 6/2007 and its revision PP 3/2008 provides a framework for licensing the use of forest land for a range of environmental services as well as timber products. PP6 and PP3 also accommodate a greater range of community interests through licenses for Community Plantation Forests (HTR), Community Forests (HKm) and Customary Forests (*Hutan Adat*). With the existence of these new regulations, local government and National Government can put together their national and local land use planning that ensure the largest areas of contiguous forest are preserved, thereby minimizing fragmentation.

6. Conclusions

High rate of deforestation and forest degradation has caused serious problems in many regions of Indonesia. Intensity of drought and flood enhanced and caused serious impact on community livelihood. Continuation of this condition will slow down the development process. Government of Indonesia is in the process of set up strategies to reduce emission from deforestation and forest degradation with support from a number of international funding agencies and developed countries. The main challenge in the implementation of the REDD program is synergizing the land use spatial plan between local and national government and programs on poverty reduction.

The existence of Act 26/2007 which requires local governments to progressively revise their spatial plans (Act 26/2007) and the Government Regulations PP 6/2007 and its revision PP 3/2008 creates good framework for licensing the use of forest land for a range of environmental services as well as timber products for local and national governments and also to accommodate a greater range of community interests through licenses for Community Plantation Forests (HTR), Community Forests (HKm) and Customary Forests (*Hutan Adat*) for combating poverty.

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