State Forest Land Management after Deforestation

Herry Purnomo and Philippe Guizol

Abstract

Global annual rate of deforestation is 13 million ha. Deforestation is mostly located in Southeast Asia, Africa and Latin America. Logging concessions exploit pristine forests in one particular region and then move to another region. Boom-and-bust of logging concessions, with complex credit network, left behind deforested and degraded land, communities with less livelihood opportunities and deeply weakened local institutions. Then wood supply shortage causes the decline of wood-based industries and finally creates massive unemployment in wood industries itself. In Indonesia current statistic shows that at least 60 million ha of State forest are unmanaged.

This land degradation is not the result of a 'tragedy of the commons' but the result of a brutal destruction of former local institutions by the concession systems on state land, which created open access. Based on a large body of field research, scholars criticized this 'tragedy of the commons' theory. They showed that such tragedy outcome is much more unlikely to happen where resources users are able to communicate and develop agreements about the use of the resources and where local users got the opportunity to build their own institutions related to the resources use.

Some government in Asia already attempted to improve the forest management on State land by providing more rights to local people. Chinese and Philippines governments allocated right to manage land to communities to plant trees. In result, the reforestation in China and community forestry in Philippines produces some success stories. By contrast in Indonesia, the government is implementing large national reforestation program without giving rights to manage to local communities. Evidence of failures of this program, which targets 3 millions ha during 2003-2007 in the form of social movement, is already observed.

We tested the following hypothesis, based on the current knowledge about renewable resource management: Indonesian government would give more chance to its own reforestation program by allocating long term rights (and duties) to local communities to manage deforested lands. This right allocation would have multiplier effects: it would benefit the communities, reduce social conflict, fulfill future wood demand, and by consequence also secure future employment in wood industries.

At the national level, we figured out scenarios and policy interventions which would be feasible under the current existing system (Structure-Institution-Actors). Our first results indicate that about up to 12 million permanent jobs could be created by giving more rights to local communities. At the local level, we observed that approaches to revitalized village and district institutions such as developed in our "Leveling the Playing Field" (LPF) project are feasible. This European Union funded approach aims to improved stakeholders' coordination through facilitating communication, learning, institution building; thus, building on previous research about common pool resources management we expect to find the way to create better conditions for forest management. Such approach can be used to rebuild local institutions after they were affected by irresponsible logging concessions.

Keywords: deforestation, open access, employment, communities, land-allocation, modelling, Asia

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I. Introduction

The timber industry is geographically mobile and subject to a boom-and-bust cycle that depends on the size of the tropical forest resource and the rapidity of its harvest. As one country's primary forests become logged out, larger companies seek new stands else where. The Philippines dominated the international tropical timber industry, which grew steadily until the late of 1960s. Then its place was taken by Malaysia. In 1970s Malaysia shared timber leadership with Indonesia, which expanded its export in those years. Indonesia led the timber industry until late 1980s. In 1990s, there is evidence that the industry is once again on the move, with increasing Asian investment in Papua New Guinea, Vietnam, Cambodia and Guyana (Gale 1998).

Logging concessions exploit pristine forests in one particular region and then move to another region. Boom-and-bust of logging concessions, with complex credit network, left behind deforested and degraded land, communities with less livelihood opportunities and deeply weakened local institutions. Then wood supply shortage causes the decline of wood-based industries and finally creates massive unemployment in wood industries itself. In Indonesia current statistic shows that at least 60 million ha of State forest are unmanaged.

In Southeast Asia, the rent seeking behavior drives most deforestation through organized and illegal logging, both for lumber and wood pulp, as well as land clearing for cash crops like coffee and oil palm by smallholders, large private commercial estates and state-owned plantations. Other causes include ill-considered granting of concessions to log huge areas of forest. Widespread corruption in the government, police and military make it almost impossible to control logging in many countries. Although there are a number of clear causes of deforestation and degradation, countries differ greatly in the social factors affecting forests. Macroeconomic policies, economic crises, infrastructure development and other factors can inadvertently but dramatically contribute to forest loss and degradation (CIFOR, 2006).

Each year about 13 million hectares of the world's forests are lost due to deforestation. At the same time, forest planting, landscape restoration and natural expansion of forests have significantly reduced the net loss of forest area. The net change in forest area in the period 2000-2005 is estimated at -7.3 million hectares per year, down from -8.9 million hectares per year in the period 1990-2000. Asia moved from a net loss of around 800 000 ha per year in the 1990s to a net gain of one million hectares per year between 2000 and 2005, primarily as a result of large-scale afforestation reported by China. Forest areas in Europe continued to expand, although at a slower rate than in the 1990s. (FAO 2006). Forests in the Asia-Pacific region cover approximately 699 million ha. 113.2 million hectares are forest plantations, or 16 percent of the total forest resource. The Asia-Pacific region accounts for 61 percent of the world's plantation forests (McKenzie *et al.* 2004).

Deforestation and degradation[1] of old forest directly affect the livelihoods of forest-dependent people. They are suffering of this process. In Indonesia, for instance, 60 million hectare forests have been degraded. Tropical forest destruction has been the subject of a great deal of

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[1] Forest degradation is impoverishment of standing woody material mainly caused by human activities such as over-grazing, over-exploitation (for firewood in particular), repeated fires, or due attacks by insects, diseases, plant parasites or other natural causes such as cyclones; Meanwhile Deforestation is a non-temporary change of land use from forest to other land use or depletion of forest crown cover to less than 10 percent (FAO 2000). We use term "degraded area" to represent both deforested and degraded areas.

research. However, relatively little work has been done on the factors that lead to the expansion of forest cover and help counter some of the negative impacts of tropical forest loss.

If new forests are planted, how then local communities can benefit from it? This paper describes scenarios for degraded land management, which could benefit local communities. There is a new opportunity to empower local communities to manage state land after forest degradation; this involves the emergence of proper institution.

These scenarios would create new forest and new future for current marginalized people, moving from "rich forest poor people" to "new forest new future". This paper takes Indonesia as a case study taking lessons learnt from other countries such as China and Philippines.

II. Institutions and Reforestation
2.1. Institutions

An institution is simply defined as "the rules actually used (the working rule or rules-in use) by a set of individuals to organize repetitive activities that produce outcomes affecting those individuals and potentially affecting others" (Ostrom 1990).

Many other definitions of institution can be found. An institution is an established practice that is determined as important by two or more people forming a group. Institution is a custom that for a long time has been an important feature of some group or society. Weiss (2004) defined important institutional variables as ownership distribution, administrative structure and political procedures.

Weber (1995) defines institution by contrast with agreements issued by an organization. An organization produces agreements, which are applying only to its members. An institution is an agreement, which compels more people than the group, which issued this agreement. We can observe that the strength of an institution can be measure by the number of individuals who follow its rules.

The institution role in economy is to minimize transaction costs to operate the society by reducing uncertainty. If rules of the game are clear to the players and enforced, then everyone can anticipate their own decision outcomes, disputes on the rules would not occur frequently, rent-seeking behaviors would be meaningless and investment would be more secure. Institutions thus could reduce transaction costs, and improve efficiency of the resources allocation (Imai 2002).

Sato (2005) argued the usefulness of SIA (Structure-Institution-Actors) approach in analyzing economic change and its impacts. S is defined as a playing field i.e. a field in which actors play, I as formal and informal rules and their enforcement, A is an entity of action. If we used a metaphor *sumo* wrestling, then the two *sumo* players and referee are A, the *sumo* ring is S, and the rules of the *sumo* game are I. Domestic S, I and A are affected by those outside the national border. Institutional program reforms from IMF, World Bank and CGI can directly influenced the I. Domestic A can be affected by foreign companies and investors coming into the country. Domestic S is influenced by interrelationship with the international S through trade and investment. Institutional reforms may have changed the lineup of actors (I→A); some new actors emerged, while other actors disappeared. The existing actors may react in accordance with purpose of I reform, but may show unexpected behaviors, which react against the reform's purpose (A→I).

2.2. Forest Expansions and Reforestation Program

Zhang (2000), which looked at the Chinese province of Hainan, found that a wide range of socio-economic factors such as timber prices, population growth and land-management regimes have been leading to rainforest exploitation but also encouraging investment in forest plantations. He argued that, as well as markets and prices, institutional factors play a key role in forest expansion in China. These factors have included the transfer of state-owned forestry land to state-owned enterprises, the decentralization of management, the distribution of forestry land to households through de-collectivization and the re-definition of property rights through various kinds of joint forest management ventures. He also found that de-collectivization is an incentive to plantation investment.

Hartono (2002) found that medium and large-scale plantations linked with paper pulp schemes had the best financial performance. It argues that this has a number of important policy implications, including the need to provide smaller plantations with the kind of services and connections their larger competitors enjoy by virtue of their size. One way out of this dilemma would be to establish nucleus-estate or out-grower schemes. In these, smallholders undertake cultivation of trees (or other crops) while a central authority - either public or private - is responsible for such functions as collection of output from the producers, provision of seeds and inputs, technical assistance, and processing and marketing of the final product. Such schemes have been used successfully in many crops and in many countries, the most relevant example being Malaysia's outgrower schemes in oil palm. These have produced high incomes for their participants and high levels of efficiency. These combined to make Malaysia one of the world's most successful exporters of palm oil.

Since 2003 and upward the central government of Indonesia have been implementing special programme called National Forest and Land Rehabilitation Program or GERHAN. GERHAN is a government programme aims to rehabilitate degraded forests and lands to optimally re-function them to give benefits to the people. GERHAN is organized at three functions (coordination/advisory, controlling and executing) and at three levels (national, provincial and district). The coordination function located at the national level that is done by Coordination Team of Environmental Improvement through National Rehabilitation and Reforestation. At the provincial level the governor is responsible for controlling the carrying out of GERHAN with support from the Controlling Team at provincial level. The execution of GERHAN located at the district level which is named Execution team of GERHAN at district level. This team is headed by the district mayor. However, in the practical execution of GERHAN programme, the team is headed by District Military Commandant, with Head of Forestry District as the team secretary. Perhutani and Inhutani (state own companies) and other related governmental institutions as the team members. The main duty of the team is to execute GERHAN activities in the fields.

The government of Indonesia revealed the achievement of tree plantings in 15 provinces until the end of April 2004 through GERHAN is 70.21%. However, some NGOs reported there are no sufficient people participation at all levels. The planning was top down. Types of trees for GERHAN are not meeting aspirations of local communities and local farmers. This GERHAN program seems to follow a string of similar past programs, which used up large amount of Indonesian public money with poor results in the field. Prior 1980 similar programs had little success. Plantings in the 1950s and 1960s covered 2.2 millions hectares in Sulawesi, Kalimantan and Sumatra. But these figures do not account for losses incurrent after the survival assessment (three years after planting). By 1980 the survival rate at Year 9 was as low as six percent for regreening programs and 34 percent for reforestation (FAO 1980; cited in Davis 1989). These plantations might have been repeatedly burned or harvested and not replanted. Apparently, only

about 67000 ha established under these programs prior 1980 have remained (Fenton and Neilson, 1998). From 1984 to 1999, successive national plans (REPELITA 4, 5 and 6) announced the plantations of 4.25 millions hectares, while about half of it has been actually planted mainly by private companies, which used (and misused) public incentives (in Enters, 2003).

III. Methods

The method used is as follows (1) Describe the structure, actors and institutions of degraded forest; (2) Analyst the interactions among SIA components; (3) Develop scenarios of different institutions applied for degraded land and their impacts. We used to select actors the approach described by Colfer et al. (1999).

IV. Results

4.1. Structure, Actors and institutions of degraded forest

4.1.1. Structure

Since 1966, forestry and petroleum had become the engine of Indonesian national economy. Soeharto, the second president of Republic of Indonesia, recovered Indonesia's terrible economy using consecutive of five-year development plans (REPELITA). Forests at that time were the main resources available for generating quick money. The role of forestry sector in the first REPELITA was (a) To provide cash for the development of other sectors to increase the performance of macro-economy; (b) To provide land for plantations and industries; (c) To provide services for environment and social functions (Haeruman 2005). As a result, Indonesian economy grew fast, particularly industrial sectors until mid 1990s. However, forestry sector was not able to boost the economy of local communities and alleviate their poverty. Forestry sector had successfully functioned to mitigate the 1966 crisis, which was actually the first Indonesian economic crisis.

The second crisis hit the all Asian region in 1997. Since then, Indonesia has been struggling to reconstruct its economy and to implement a wide range of institutional reforms including forestry. However, current forestry sector do not have anymore the 1966 forest resources. The World Bank has made the shocking forecast that Indonesia's lowland natural forests will disappear by 2010 unless effective measures are taken to stop the deforestation. The causes of deforestation include over-logging, fires, transmigration and forest conversion to agricultural land (Sato 2005).

The Government of Indonesia (GoI) divides its forest land into four functions i.e. 1) nature and water conservation, 2) protected forest, 3) limited production forest, 4) production forest and conversion forest. The government implements different management schemes and policies for each type of forest functions. The forest degradation rate has been increasing dramatically during the last twenty years. While the total state forest land covers 133 millions hectares, the forest degradation area increased from 1.8 millions ha annually during the period 1985-1997, to 2.6 millions ha annually during the period 1998-2000. This annual degradation reached 2.8 millions per year after 2000. There is no signed that this degradation rate is reducing despite many on going programs to combat illegal logging, to improve forest governance and to enforce laws. The extent of forest areas under different function are described in Table 1. A total of 32 million hectares of state forest land are non-forest. The total degraded and deforested land in Indonesia is now about 60 million hectares.

Table 1. Deforested land in the forest areas (x 1,000 ha)[2]

Forest cover / Forest Function area	Forest	Non-forest	No data	Total cover
Nature and water conservation	12,926	2,867	3,678	19,471
Protected forests	20,853	4,748	4,360	29,961
Limited production forests	18,129	4,341	3,159	25,629
Production forests	20,946	10,527	3,857	35,332
Conversion forests	*11,038*	*9,470*	*2,227*	*22,735*
Total area	83,892	**31,953**	17,281	133,128
Total permanent forest area (without conversion forest)	72,854	22,483	15,054	110,393

4.1.2. Institutions

Important institutional variables are ownership distribution, administrative structure and political procedures (Weiss, 2004). Long ago before the state of Republic Indonesia was established, the land belonged to communities. The Dutch rules during colonial time from 1596-1945, divided forest areas into state forest (boswessen) and village forest. After the Indonesian independence in 1945, the Indonesian government claimed that all state land under colonial Dutch rules remained state land. However, less than 20 percent only of boundaries between state land and village land have been gazetted by the 'New Order' regime of Soeharto. Indeed, the gazetting process, command-and-control style, let little space for public and community participation. In South Sumatra province of Indonesia, for instance, traditional institutions named Marga was managing territories including villages, and forests, which were not under state forest Dutch rules. Most of these Marga forests became state land under the new regime; this generates conflicts between government and communities.

In Indonesia as in many countries, formal ownership of tropical forest is vested in the state. Under the system of concession, the government acts on behalf of the state and leases the right to manage forest and harvest timber to private or state owned concessionaires Gale (1998). The concessionaires receive licenses that set out the terms and conditions under which timber extraction may take place. The state, by means of Forest Management Licenses (FMLs), divests itself of direct forest responsibility and devolves these responsibilities to private individual and/or corporations. In Indonesia, this kind of institutional arrangement contributed to the forest degradation. Due to poor forest management, many FML collapsed and their number decreased from 500 to 150 units. Irresponsible practices of forest concessionaires and other forest stakeholders have destructed 60 million hectares of tropical forests. The government authorizes the used of this degraded areas.

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[2] Data strategis Kehutanan 2004 (Dephut 2005)

Each degraded land is under the rules of a variety of formal and informal institutions, which may each site almost unique. However, the general condition in degraded land can be explained as follows. First, it is legally claimed as state land. The local and central government hold and enforce legal rights on state land. Second, the local communities claim traditional right over the land. The right may come from their ancestors who used the land. Third, local stakeholders have more chance to recover some rights over land as less powerful stakeholders and other actors with rent seeking behaviors try to get access to degraded land by contract to pristine forests.

Administrative procedures implement government policies related to land utilization. These procedures can be centralized, decentralized or poly-centric. Political procedure is the way people voice is represented. The interaction between administrative and political procedures produces a variety of land ownership types. Land ownership is about how the forest land is utilized and managed. Following Ostrom et al. (1994) description we consider four types of land ownership scenarios which are public goods, common pool resources, toll goods and private goods due to the variability of subtract-ability and exclusion of the land (See Figure 1).

		Subtract-ability	
		Low	High
Exclusion	Difficult	Public goods	Common pool resources
	Easy	Toll goods	Private goods

Figure 1. Four type of goods (Ostrom *et. al* 1994)

4.1.3. Actors

We identify actors thanks to the following criteria: proximity, legal rights, traditional rights, dependency, knowledge about forest management (indigenous or modern) and actor representations regarding forests.

Proximity refers to how close the actors are situated relatively to the forest management unit or FMU. Legal rights are the rights allocated by the government according to, or mandated by, current laws and regulations. Traditional rights, on the other hand, refer to the rights that are usually not written but are recognized and acknowledged by the people (or the local community). Often, these rights derived from a long history of customs and traditions that existed for many years and have been accepted by the community. Dependency is related to the livelihood of the people and the degree to which they are supported by, or dependent upon, the forest. It is also associated with the local people's sources of alternative livelihoods outside of the forest itself. Knowledge about forest management refers to actors' familiarity of the ecology of the forest, its history, including traditional methods and indigenous knowledge of forest management.

Actors 'representations refer to the inherent value of the forest to actors, including spiritual beliefs about their lives and their link to the forest, it is an anthropologic term. Behaviors regarding environment or a renewable resource depend firstly upon the representations of nature shared by the group (Weber, Reveret, 1993). The representations of nature, linked to the system of values specific to the society, correspond to what Elinor Ostrom calls "constitutional choices" (Ostrom, 1990). On the basis of these shared representations of nature, management of the resource or the forest as a common asset becomes possible.

The 'Who Counts' matrix approach described by Colfer et al. (1999) is basically a multi-criteria 'scoring' system where the score range between 1 and 5 (1 = high, 2 = relatively high, 3 =medium, 4 = relatively low, 5 = low). The score indicate the level of importance, as perceived by each stakeholder, with respect to the different management criteria. The mean scores for each column are computed across the bottom of each table. The cut off point for the study which defined 'Who Counts' is a mean score of less than or equal to 3. Table 2 shows that the local communities, plantation company and local government are the important actors in planting degraded forests.

Table 2. Actors of Degraded forest

Actors / Dimension	Local community	Plantation company	Oil palm company	Local govt.	Central govt.	NGOs and professional interest groups
Proximity	1	1	2	3	5	5
Pre-existing rights	1	5	5	5	5	5
Dependency	1	1	5	2	3	5
Knowledge on forest management	1	1	5	2	2	1
actor representations of nature	2	3	5	2	2	1
Daily activity on site	2	3	4	2	5	3
Legal rights	5	1	5	1	1	5
Median[3]	1	1	5	2	3	5

The use case diagram in figure 2 illustrates actors on degraded land and their roles. Local communities claim their land rights based on traditional uses. But they seldom have formal proofs for their claims. The governments regulate and enforce the formal rights. Big forest and oil palm plantations, due to the current institutional setting who favor the big companies and capital intensive model, get the formal right to use land. NGOs work to empower local communities to claim their rights.

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[3] **Median** which is the middle number of a group of numbers; that is, half the numbers have values that are greater than the median, and half the numbers have values that are less than the median. For example, the median of 2, 3, 3, 5, 7, and 10 is 4.
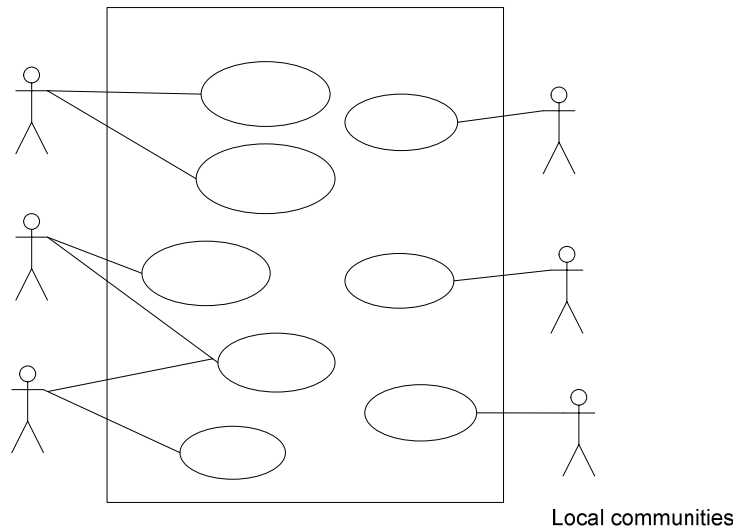
Figure 2. Actors and their roles in degraded land

4.2. Reforestation Model

The following actors, local communities, forest plantation company, oil palm company, local government, central government and civic associations are working to influence how the degraded and deforested areas are distributed and managed. The stock and flow diagram of the model is illustrated in Figure 3. Natural forests due to unsustainable logging and illegal forest practices are deforested and degraded. Administrative procedure and power balance among these actors affect the allocation of land right.
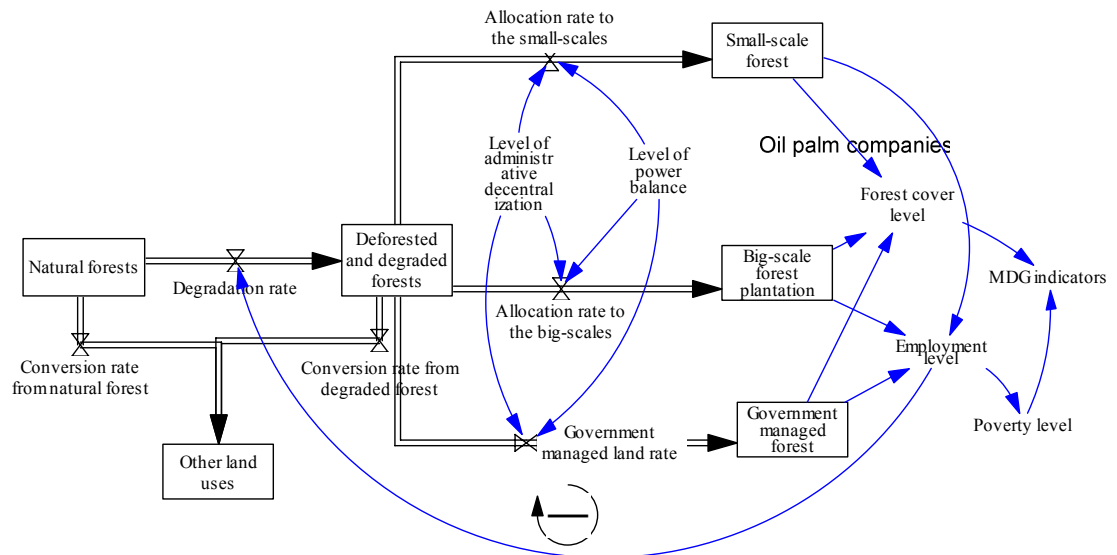

Figure 3. Conceptual model of Reforestation

When decentralization takes place, local government becomes more powerful than central government. Local elites and communities get more access and rights on degraded forests. By

contrast, when centralization takes place, then central elites get more access on degraded forests. If private companies are very strong then the tendency to make forest or oil palm plantations on a large scale with intensive capitals would occur. If local community is strong then small scale forestry will likely occur. If government is too strong, then it will unlikely give rights to other actors. The government will do reforestation by itself, with poor local people participation.

We used qualitative indicators of employment, well being of local communities and forest cover to assess impacts of the different scenarios tested by this model. These indicators relate to Millennium Development Goal (MDG) 1, which is "Eradicate extreme poverty and hunger", and MDG 7, which is 'Ensure Environmental Sustainability'.

4.3. Scenarios Development

We tried out to implement four scenarios of managing state land after deforestation i.e. free auction, privatization, small scale forestry and transmigration. For each scenario, we hypothesized the likely impacts.

4.3.1. Auction of forest land

Government regulation (*Peraturan Pemerintah*) No. 34/2002 article 43 point 3 stated that all forest use permits shall follow auction rules. Free auction is the current government policy to give to private and state/district own companies access to forest land. The companies are offered to have permit to land clearing and plant trees for plantation (Izin Usaha Pemanfaatan Hasil Hutan Kayu for forest plantation or IUPHHK untuk Hutan Tanaman).

The offer is conducted by the central government in Jakarta (see http://www.dephut.go.id/INFORMASI/PH/BPK/Lelang_IUPHHK_05.htm). In year 2004, one million hectares was planed to be auctioned that way. The unit scale of forest land to be auctioned ranges from 20,000 to 120,000 hectares.

The auction is conducted by the central government. Local government and communities don't involve much in this arrangement. The primary motivation of the companies usually is to cut trees through IUPHHK, which is a right to cut the remaining trees, rather than to plant trees. The money generated out of wood from tree cutting is used for plantation establishment.

This scenario jeopardizes local community livelihoods. The forest land allocated by auction is more than often claimed by local communities who could not participate to the auction due to lack of access to information and capital. As their local institutions have been weaken by the state land policy, local communities can't organize themselves to collectively bid for concession; moreover the concession scale of 20,000 hectare or more are far too large for local communities as each individual household usually is able to manage about 3 to 10 hectares of land. So this scenario can't improve local community livelihood, generate employment and improve control over forest land, but it can rather empower business communities, which have adequate source of funding and good relationships with elites from central and local government.

4.3.2. Privatization

Privatization of forest land gives private ownership of state forest land to individual or groups/corporations. This scenario was partly done in New Zealand and in some cases in Indonesia.

In 1985, a decision was taken to privatize the commercial functions of the New Zealand Forest Service, i.e. to transfer these functions into a state-run enterprise. Thus, in April 1987, the New Zealand Forestry Corporation was established as a limited liability company empowered to manage the government's commercial forestry operations (550 000 ha of forest plus sawmills, nurseries and other assets). New Zealand Forestry Corporation was successful as it could turn a loss-making government agency into a highly profitable corporate enterprise. No longer constrained by social and environmental objectives, which were now the domains of the newly established government departments, New Zealand Forestry Corporation focused on its profit objectives (Clarke 1999).

However, results in terms of replanting trees and job creations are unclear. The corporations were not obliged to plant trees; they were rather looking for the most profitable land use unless the government issues specific regulations. In terms of employment, the corporations tend to rationalize the number of employees on their land. Even though the State gave to the corporations the ownership of the trees not the land, land issues emerged as the land claims of Maori indigenous people remained unsolved.

In Indonesia cases, most forests are state forest. However, some state lands are strongly claimed by local people. In Muara Enim, South Sumatra, where the EU project of "Levelling the Playing Field" takes place, new land lord are emerging progressively. The land shifted from common lands to private land through the following process. Prior the New Order regime land, which were under the Marga institutions were commons i.e. not transferable by individuals. Under the New Order regime land became state land common to all Indonesian people. When the state decided to create concessions actually it privatized the State land; State land became the private domain of the State, local people were suddenly excluded from access to forest resources; then after 1998 when communities claims their rights as the Marga institutions were actually destroyed, some pieces of land were re-allocated to individual households and land in the process became transferable. Now` poor households are selling their land to fulfill their immediate needs as food, consumer goods and education, jeopardizing their future source of livelihood. And new landlords are emerging.

4.3.3. Small Scale Forestry

This scenario gives to local communities the right to manage, utilize and plant trees in particular forest areas. The forest is still own by the state, but rights to manage is devolved to local communities. Individual households or groups of households may manage forests. Each household can manage from 3 to 10 hectares. The land still belongs to the state so it is not transferable and the land holder cannot sell it; they only can sell the tree they planted. Individual household can seek economic scale through association with others. Our calculation shows that with this scheme outside Java, 3.5 ha is enough to provide a permanent job.

This right allocation would have multiplier effects: it would benefit the communities, reduce social conflict, fulfill future wood demand, and by consequence also secure future

employment in wood industries. At Indonesia country level, we found that about up to 12 million permanent jobs could be created by giving more rights to local communities over degraded lands (Purnomo, 2006). Building on former existing institutions such as Marga and Nagari in Sumatra will give local communities foundation to manage land. Marga institution was managing territories, which included several villages and their inhabitants. Today new inter-villages institutions can be build on former Marga institutions to improve collective actions.

This scenario will boost employment at local level, increase well being of local community and at the same time it will green the landscape. Economic improvement will empower them in taking responsibility and roles in forestry. We strongly argue that the local communities will eager to plant trees as long as they have clear and secure rights over land use.

4.3.4. Transmigration

We implement "HTI Trans" as another option to be explored. Transmigration is a popular program in Indonesia during the 80s. Transmigration is population migration from over populated Java Island to other Indonesian islands i.e. Sumatra, Borneo, Sulawesi and Papua. Transmigration could be spontaneous or organized by the State. One of the transmigration State programs called "HTI Trans", involves plantations of forest trees. Each household gets 2-3 hectares to plant. Most of them include out-grower scheme, a scheme to link household tree growers with industrial forest plantations managed by a big company. The company will process in its mill the tree products from the household. The company is responsible in providing seeds and marketing the products

This scenario will produce small and private forest plantations. However, since the small scale plantation holders were migrants, the dispute between local communities with the new comers were unavoidable. This scenario will empower central government, rarely local governments could be involved actively in decisions as land allocation. The impacts of this scenario are good for generating employment and increasing forest plantation, but are not so good for well-being of local people and mitigating conflicts amongst communities in particular area.

Table 3 summarizes the four scenarios of managing state land after deforestation. Clearly the small-scale forestry scenario has 'high' scores for all likely impacts.

Table 3. Scenarios to manage state land after deforestation

Scenario	Institution variables			Likely Impacts			
	Ownership	Administrative procedure	Political procedures	Well-being local community	Employment creation	Forest cover	Leveling the playing field
Forest land auction	State forest	Centralization	Empowering Jakarta elites and central /local businessmen	Low	Low	Medium	Low
Privatization	Private forest	Decentralization	Empowering Jakarta and local elites	Low	Low	Medium	Low
Small scale forestry	Common resources	Decentralization	Empowering local communities and local government	High	High	High	High

Transmigration	Private forest	Centralization	Empowering new comers and central government	Low	High	High	Low

V. Discussion

Most traditional forests were common property controlled by local institutions, which generated rules to define the use of forest resources and to limit and control their access. This system was able to sustain forest and to secure local people livelihood over long term. There was no 'tragedy of commons' as illustrated by Hardin as forest access were controlled. After independence, in most developing countries the State took over the control of forests and break up these existing local institutions, denying to local communities rights to manage forests. These forests then were allocated to logging companies, which were not able and whatever in many cases didn't have the will to actually control the forest access. The logging companies, which are profit oriented, logged the trees to maximize their profits and did not invest into forest rangers or forest management operations to minimize their costs. Then a situation of tragedy of free access actually occurred where a variety of actors could exploit the remaining forest resources. This left degraded areas, which amounts to 60 million hectares today in Indonesia. FML arrangement failed clearly to sustain forest.

These degraded areas are now unmanaged. They are actually in a situation of open access as the State has not the means to control their access and the local people not the rights. New institutions are needed to manage forest land.

While many scholars focus their attention to forest degradation and deforestation, conditions of forest expansion are overlooked. This paper explored scenarios of managing degraded land. It seems that attributing to local communities long term right to manage forest is the best available option. This may occur only when local community has enough power. The role of civic association, to empower local community and as watchdogs is very important. The community cannot fight alone. A pre-existing local institution as Marga in South Sumatra helps to re-build local institutions to control the forest land and the forest resources and to empower local communities. Decentralization helps also as it empowers local government, which are closer to local communities. Even though, decentralization does not guarantee that community hold enough power, it give them more chances to participate in decision making process related to degraded land.

Many countries are beginning to give control of forests to regional authorities, who have a much better idea of the best way to manage their resources than centralized departments. This trend towards devolution is happening in Asia, Africa, China and central and South America. In some cases it is decreasing the rate of damage and increasing the area of forest that is being selectively logged. In other cases the experience is more negative (CIFOR, 2006). Local elites, who do not necessary represent local community, might struggle for their own interests.

Some ecosystems may be even difficult to manage at local level and should be manage at a higher level as a rivers which are flowing through several districts and many villages; in such case the river system should be managed at higher level as district or region, while forest should be manage in many cases as much as possible at the lowest level as village. The principle which consists in choosing the right level of management according to the nature of the issue and the attributes of the resources itself is called subsidiary principle; that create a "poly-centric

institutional arrangement" where the level of the authority in charge of the resources management differs according to its ability to manage and control this resource.

VI. Conclusion

Deforestation can be viewed in many cases as a tragedy but it provides also an opportuny to build new institutions in forest areas. Old forests belonged to the state, and state devolved its right to manage forests to big companies on large scale. This scheme cleary failed to sustain the forest. When old forests disappear, old institution was no longer noticeable. Giving long term right to manage to local communities is the most appropriate option to make positive impacts on employment, well being of local communities, forest cover and to level the playing field.

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