



CHANGES IN COMMUNITIES' LAND-USE PATTERNS AND FOREST CONCESSIONAIRES: A STUDY IN EAST KALIMANTAN

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Abstract

The increasing number of forest concessionaires in Indonesia have contributed to the deterioration of natural resources and reduced the availability of land for forest communities. This condition has changed the land-use in forest communities. The villagers in Punan Bengalun and Seputuk in East Kalimantan have engaged in land-use management for many generations based on their habitation of remote forest areas and their practice of shifting cultivation in the jakau (a local name referring to land that lies fallow in the forests, claimed by forest communities during its utilization for shifting cultivation). This study was conducted to identify land-use changes and patterns in forest communities and the effects of forest concessionaires. The research applied several participatory techniques and questionnaire interviews to collect the data. In relation to land-use management, forest concessionaires took the initiative to implement interactive planning for land-use through the concessionaire-developed Social Forestry Program (SFP) in Seputuk. The initiative was designed to improve the use of jakau in forest communities. This SFP was addressed to be an income source and a long-term community development program. As there were obstacles encountered in the implementation of SFP, forest concessionaires were challenged more to make a success of SFP.

Keywords: *forest communities, forest concessionaires, land-use management, Social Forestry Program*

Introduction

After obtaining management rights from the central government, forest concessionaires have managed large tracts of forest areas in Indonesia since 1970s. The forest activities performed by forest concessionaires, such as poor forest management and uncared-for forest sustainability, have caused environmental damage, forest degradation and forest deterioration (Intip 2003, Crevello 2004, Sudewi 2007). These have changed the land-use in forest

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communities, which then adapted strategies to develop new techniques by using their traditional knowledge in their land-use (Crevello 2004). The previous studies showed that the entry of forest concessionaires initiated the radical changes in land-use patterns (Abdoellah *et al.* 1993), but they did not discuss the specific involvement of forest concessionaires on land-use in forest communities. In managing forests, concessionaires are expected to take the social needs of local people into consideration through forest community development program (FCDP). They are required by law to consider the existence of forest communities residing and living in or around the concession areas (DTE 2006, Basuki 2005), especially those who depend on forests for their livelihoods (DTE 2006). As forests and forestry development in Indonesia have marginalized the importance of these residents (Basuki 2005), the Indonesian government has obliged all forest concessionaires to assist and promote the development of such communities in and around their forest areas since 1997. PT Intracawood Manufacturing (PT IWM) in East Kalimantan, for example, has started giving assistance through FCDP since its establishment in 1988. The assistance for forest communities is more towards "short-term" assistance, such as assisting the needs of forest communities for education, health, religion, culture and safety.

Until now, it can be seen that support from concessionaires to forest communities constituting long-term assistance (an assistance which can realize the communities' prosperity so that forest communities do not hope for any help from forest concessionaire anymore) is insignificant in Indonesia. Therefore, forest concessionaire must consider such alternatives of assistance for forest communities which are not supported with minor and short-term programs (Wollenberg *et al.* 2009). Long-term assistance in the form of program for optimizing the forest communities' capabilities and improving forest resources utilization will motivate forest communities to be autonomous. The importance of land to forest communities and the responsibility of forest concessionaires to support economic development of forest communities are two considerations whose mutual fulfillment deserves attention in increasing the encroachment on forest concessionaires. The majority of forest communities in Kalimantan, Indonesia, have developed more awareness and started to negotiate harder for their land rights (Wollenberg *et al.* 2007), indicating that land is very important for them and their livelihoods although perception of forest communities regarding land management was difficult to understand for outsiders (Basuki & Sheil 2004).

It is known that although forests can provide the basic needs of forest communities, residents also need to open forest land to practice cultivation to produce food supplies. Research conducted by Sheil & Liswanti (2006) indicates that forests represent the most important land type for forest communities because so much can be taken and derived from them. In

addition, rivers, cultivated land and village areas are also important, and all land types still retain values (Sheil & Liswanti 2006).

Forest communities have cleared forest to provide food from generation to generation. In most areas in the world people clear forest for agriculture, but most of the tropics people clear forest for crop production by applying shifting cultivation (Brady 1996). The shifting cultivation system applied by forest communities are generally sustainable (Brady 1996; Crevello 2004). Forest communities practice shifting cultivation, an agriculture system based on the conversion of secondary forest to dry-land cultivation (Suwarno & Campbell 2005). This cultivation system used to be the most common type. Forest communities cut and burn the *jakau* (a local name referring to land that lies fallow in the forests, claimed by forest communities during its utilization for shifting cultivation) and produce crops on it, taking advantage of the nutrients from the ashes of the burned plants (Brady 1996). While applying shifting cultivation, forest communities leave land lie fallow for several years after harvesting in order to restore the fertility of the soil naturally—a technique passed down from their ancestors. During the fallow period, the growing bush and plant species provide soil cover and accumulate nutrients in the biomass (Brady 1996).

To utilize the fallow period, PT IWM has introduced SFP to villagers in Seputuk. This SFP is addressed to improve the land-use in forest communities and create income source for forest communities. Some research has been conducted on shifting cultivation in Indonesia and in South East Asian countries, but research on forest concessionaire's involvement on land-use in forest communities is scarce. In this paper, the present author analyzes the changes of land-use in Punan Bengalun and Seputuk and the effects of forest concessionaires. To achieve the goals, data on following points were collected: (1) changes of land-use and its patterns in Punan Bengalun and Seputuk; (2) involvement of forest concessionaires in land-use management among forest communities; and (3) potential land-use-related ways to improve the living standards of forest communities.

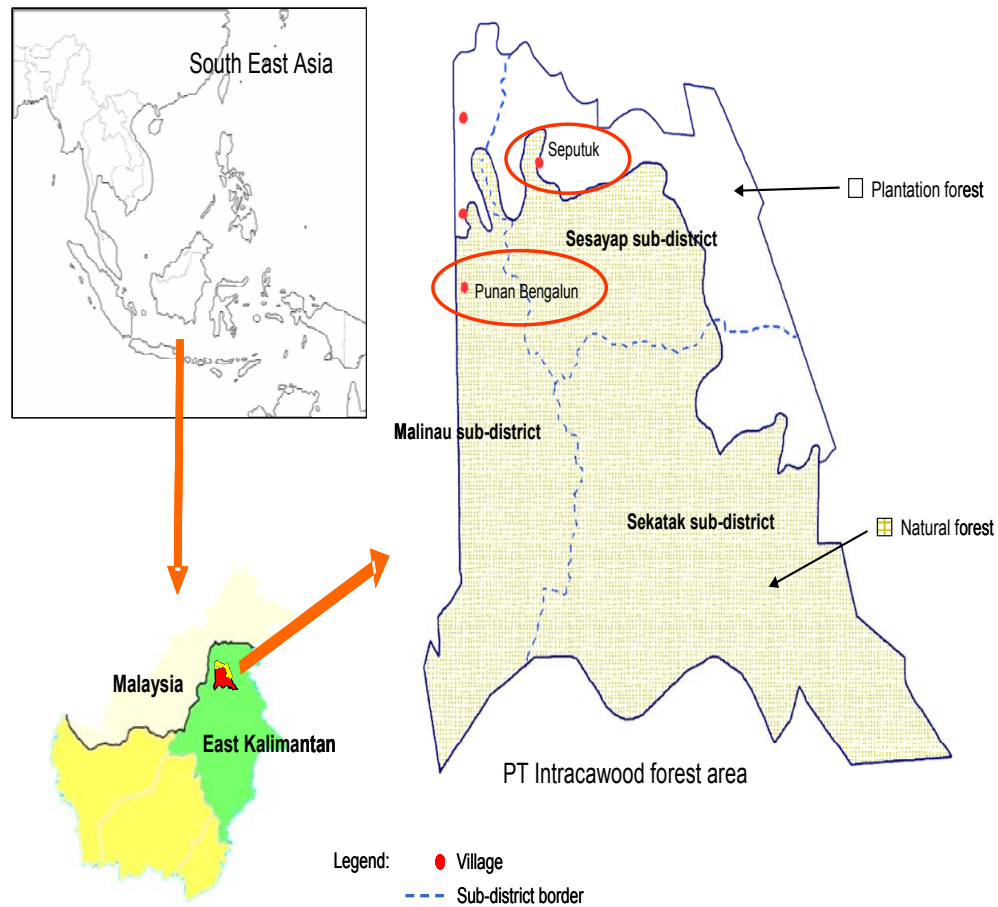
Study Site and Methods

Study Site

The surveyed villages are Punan Bengalun and Seputuk. Punan Bengalun village is located in Malinau Sub-district (Malinau District) and Seputuk village is located in Sesayap Sub-district (Bulungan District) of East Kalimantan in Indonesia (see Figure 1). These villages are surrounded by forest area managed by PT IWM. The present author selects these two villages to represent the traditional land-use patterns and the activity of PT IWM involved in land-use management in forest communities. In the two surveyed villages, most communities open up land in forest areas. They engage in

shifting cultivation and intensive agriculture simultaneously and have unique land-use patterns.

Figure 1. The Research Site



Source: PT IWM 2007

The villagers in Seputuk are involved in the Social Forestry Program (SFP) organized by PT IWM, while the villagers in Punan Bengalun are not. Accordingly, this study is conducted to clarify the history of land-use by forest communities and the land-use differences between the villagers who are involved in SFP and those who are not. Profiles of the two surveyed villages are presented in Table 1.

Table 1: Profile of Punan Bengalun and Seputuk

Surveyed Village	Area of:		Number of Households		Main Occupation of Villagers in 2008 (%)	
	Village (ha)	Settlement (ha)	1996	2006		
Punan Bengalun	126	32.447	43	45	Farmer:	98
					Government officer:	2
					Company staff:	10
					Carpenter:	0
					Fisherman:	0
Seputuk	125.74	23.926	50	100	Farmer:	89
					Government officer:	3
					Company staff:	3
					Carpenter:	5
					Fisherman:	0

Data collected from household interviews (2007)

PT IWM is a forest concessionaire that has been in operation since 1988 on behalf of the state-owned company –PT. Inhutani I (the main forest concessionaire since 1976). PT IWM supervised 250,000 hectares of forest at the beginning of its management, and this figure had decreased to 195,000 hectares by August 2003. In 2006, 38 villages are located in and around the PT IWM forest area (PT IWM 2007). After the establishment of PT Inhutani I in this area, communities living in or near the forest encountered restrictions on the utilization of forest products as declared in a policy introduced by the forest concessionaire. These communities are no longer free to utilize timber products. The forests that currently comprise PT IWM's concession had been used for hundreds, if not thousands, of years for low-intensity shifting cultivation, hunting and non-timber forest product (NTFP) collection by indigenous people.

Methods

The data collection was conducted in 2007. During the fieldwork, several participatory techniques, including focus group discussions with household members of SFP, key informants and PT IWM staff, were used to gather primary data. Questionnaire interviews were carried out in 31 households in the two surveyed villages, where the number of households were 15 and 16 in Seputuk and Punan Bengalun respectively. The households were chosen based on the indicators of their active engagement in land-use management and members of SFP. A control group was that which did not belong to SFP.

Sixteen households (all were Punan Bengalun villagers) were not members of SFP as comparison in analyzing the difference of their land-use patterns.

The History of Village Establishment and Land-Use Changes

Punan Bengalun

In 1959, there were about five families occupying one long house at the edge of Bengalun river in remote area of forest. Led by customary village chief, these families applied shifting cultivation, utilized timber and NTFPs, and fulfilled their needs for drinking water, bathing and washing from river. In 1968, this community shifted upstream to get a better place with abundant food supply, and again shifted to the more upstream in 1969. In this new place, their activities on forest remained the same as what they had previously done. In 1973, the villagers were affected by an epidemic disease that killed about 100 of its 280 inhabitants. As a result, the villagers spread to different places. However, they subsequently re-gathered and started to settle in the downstream in 1975, beginning with 38 families occupying several simple houses. This village was then familiar to be called as Punan Bengalun. After Punan Bengalun villagers moved to the current village, they started intensive agriculture on a small scale in their home gardens.

In 1996, Punan Bengalun had population of 190 (43 households), and become 226 residents (45 households) in 2006. All residents of the village are Punan ethnics, and most of them are farmers. This village is located in the remote area towards forest. The road that connects Punan Bengalun to the main road to the capital of Malinau district is steep and the road conditions deteriorate when it rains. Punan Bengalun villagers are used to walking along the small river to reach outside areas. The remoteness of their village is indicated by the fact that they barely recognize the value of the Indonesian currency.

The land-use applied by Punan Bengalun villagers addresses food supply. The activity of land-use in this village is based on local knowledge, which is passed down from generation to generation by word of mouth (Rao and Ramana 2007) and practice. To start cultivation in the beginning in a new area, villagers in Punan Bengalun cleared forest and claimed it as their own. This activity was inherited through families. Before settling in the current place in 1975, they were used to applying shifting cultivation, and they had done it since the era of their ancestors, as this system was a practical system for them to supply their foods. The availability of land before 1975 made them easier to get a new place for shifting cultivation. Fruits and edible plants which grew in abundance in the forest supplied enough foods for them. The custom of shifting from one place to other places was mainly undertaken to find a new place with abundant food. After settling in the current place, they

started applying intensive agriculture in their gardens close to their settlement. This activity was also mainly aimed at providing food.

Seputuk

In 1930, there were two huts occupied by two families at the edge of Seputuk river upstream. Led by customary village chief, these families applied shifting cultivation, utilized timber and NTFPs, and fulfilled their needs for drinking water, bathing and washing from Seputuk river. Due to the increase of the population, 1 long house at the same area and another long house were built in 1938. In 1945, this community shifted downstream to get a new place with abundant food supply and built two long houses for five families. After their establishment in 1945, Seputuk villagers had started intensive agriculture in their home gardens. The population of Seputuk had increased since then. In 1970, Seputuk villagers started building simple houses which were built through mutual cooperation by villagers. In 1995, villagers cemented a pathway in Seputuk on their own. In 2002, there was a road established by the local government to ease Seputuk villagers' access outside, connecting Seputuk to the main road towards Malinau district's capital city.

Seputuk has a population of 363 people in 100 households (in 2006) and is dominated by the *Burusu* ethnic group. 100% of the households have access to electricity and have water for drinking. The community previously had a high infant mortality rate, but it has now decreased as there is a health center in the village. Since the establishment of Seputuk in 1945, 22 floods have occurred in the village as a result of overflow of the river. In addition to flooding, in 1986 the area experienced a drought that affected agricultural activities. The village also experienced a crisis of an epidemic of upland-rice blight in 1972.

The land-use applied by Seputuk villagers is also aimed toward food supply. They have applied the shifting cultivation from their ancestors. They shifted from one place to other places for finding more appropriate places with abundant foods. Seputuk villagers settled in the current place in 1945, and since then, they started applying intensive agriculture. They plant vegetables in their home gardens to supply their foods. In the shifting cultivation activity, villagers are used to planting cassava, upland-rice and some vegetables such as cucumber, spinach, pumpkin and legumes. In addition, they fulfill their foods from forest by utilizing fruits, edible plants and animals. The pattern of land-use in shifting cultivation activity has the purpose of preserving the forest ecosystem.

Similarities of Land-Use Patterns in Punan Bengalun and Seputuk

Punan Bengalun and Seputuk have similar land-use practices that can be categorized as *jakau* and home gardens. Villagers engage in shifting

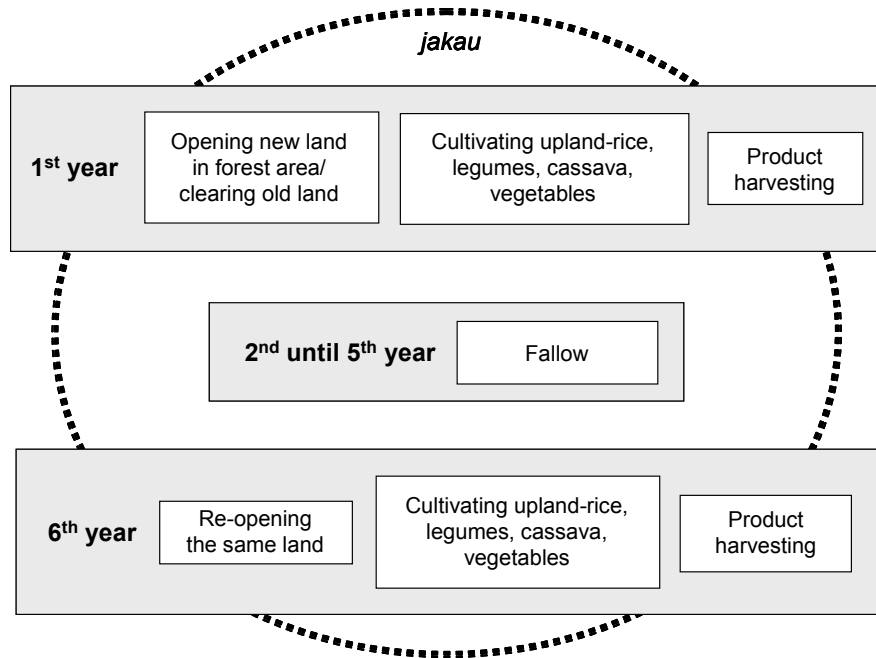
cultivation practice in their *jakau* and intensive agriculture in their home gardens. The shifting cultivation cycle of upland-rice includes: (1) clearing *jakau* of shrubs and bushes in May and June, cutting big trees and slashing branches that have grown after the *jakau* has been left for several years; (2) burning *jakau* to clear away the remnants of wood, shrubs and bushes covering the surface, usually in July; (3) planting upland-rice, vegetables, legumes and cassava, usually in August and September; (4) harvesting vegetables, legumes and cassava and replanting the same species, usually done from December to April; and (5) harvesting upland-rice, which is usually done in February, March and April. The land-use activities in *jakau* are the same every year. This research results show that along with activities in their *jakau*, villagers also engage in intensive agriculture by planting legumes, cassava, vegetables and fruits in their home gardens.

Most of the households' livelihoods apply cultivating upland-rice in *jakau*, which does not need fertilizer for growth. Along with upland-rice, they also plant other vegetables such as corn, cassava, chili, peanuts, lemon grass, pumpkins, cucumbers, taro, green mustard, eggplant, coffee, spinach and long beans. In addition, households also manage *jakau* to produce marketable fruits such as banana, mango, orange, durian, as well as *rambutan*, *cempedak*, *lai*, *langsap* and *terap* (local names) in *jakau*. Upland-rice, vegetables and fruit products are set aside for family consumption only, but any surplus may be sold or distributed to other households or relatives. In times of crop failure or shortfall, the forest products activities such as making handicrafts from NTFPs by forest communities can provide important supplemental income sources (Byron and Arnold 1999).

In relation to the application of shifting cultivation, villagers who claimed *jakau* in the area which is far from their village during the cultivation season stay in huts in the fields on weekdays and return to the village on weekends. This custom is also followed by villagers who cultivate on previous *jakau* in the headwaters. After opening up land in a forest area, villagers will utilize it for cultivation in the first year. From the second to the fifth year, they will leave it and perform cultivation in another *jakau*. In the sixth year, they will return to the same *jakau*. The rotation of shifting cultivation system in forest communities is less than tens years earlier because the land availability had decreased. The limitation of land availability has forced forest communities to utilize the same land after leaving it for short periods. The *jakau* utilization system is presented in Figure 2. This shifting cultivation system differs from which Weinstock and Sunito (1989) mentioned, namely that land is used for one to three years and is fallow for 20 or more years. The research result by Weinstock and Sunito showed that the fallow period was very long, probably because at that time (in 1989), communities had much more land than at the present. In East Kalimantan, communities let the land lies fallow in short

period (about 2-5 years) because they have limited land so that they must shorten the fallow period.

Figure 2. The Scheme of Shifting Cultivation System



Source: Interview with villagers in Punan Bengalun and Seputuk (2007)

In the implementation of shifting cultivation and intensive agriculture, there are advantages and disadvantages as shown in the Table 2. The advantages of shifting cultivation are: (1) villagers have large areas where available in which to plant upland-rice and a variety of vegetables; and (2) fertilizer is not required to enhance growth in plantations. The advantage of intensive agriculture is that villagers do not have to go far away, as home gardens are located close to their houses. The disadvantages of shifting cultivation are: (1) *jakau* is located further from houses; and (2) the system creates fallow land which can not produce anything during its fallow. The disadvantages of intensive agriculture are: (1) forest communities do not have large areas for cultivation (less than just 0.3 hectares); and (2) fertilizer is needed for plantation in home gardens, requiring extra financial investment by villagers.

Table 2. Advantages and Disadvantages of Shifting Cultivation and Intensive Agriculture Implementation

	Shifting Cultivation (in <i>jakau</i>)	Intensive Agriculture (in home garden)
Advantages	1) Larger space 2) Fertilizer is not required	Next to/near the settlement area
Disadvantages	1) Far from the settlement area 2) Creates fallow land	1) Smaller space 2) Fertilizer is required for plantations

Source: Interview with villagers in Punan Bengalun and Seputuk (2007)

Custom of Opening Land and Its Utilization by Forest Communities

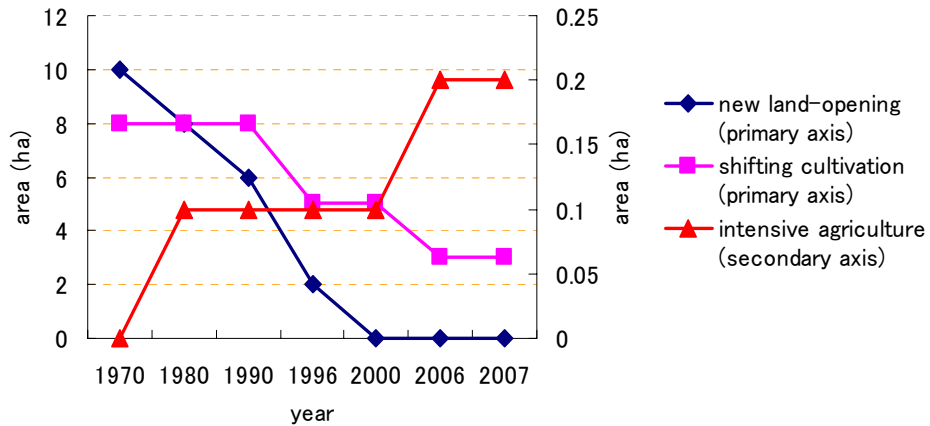
Before the establishment of forest concessionaires in this area in the 1970s, villagers in Punan Bengalun and Seputuk utilized land freely and opened up forest areas for shifting cultivation. The data of land opening and land-use in Punan Bengalun and Seputuk since 1970 until 2007 are presented in Figure 10a, 10b, 11a and 11b. In Punan Bengalun and Seputuk, villagers were used to opening new land (from secondary forest or natural forest) since long ago, but this activity has disappeared in Punan Bengalun in 2000 and in Seputuk in 1996. The activity of new land opening has faded because forest areas were not available anymore for villagers. This fact is affected by the establishment of forest concessionaires which bring restrictive policies towards villagers on forest utilization. Shifting cultivation in Punan Bengalun and Seputuk has decreased since 1970 until 2007. One of the causative factors was the influence by outsiders which caused the villagers to take on occupations in other sectors, such as working in government offices, running handicrafts manufacturing, working as carpenters and engaging in intensive agriculture.

Custom of Opening Land in Punan Bengalun and Its Utilization by Villagers

In Punan Bengalun, intensive agriculture started from 1975. Although the area of intensive agriculture was very small (about 0.1 until 0.3 hectares per household), this system has been developed for the last 35 years. This intensive agriculture activity helps them in supplying foods. The reasons for utilizing land for cultivation by villagers in Punan Bengalun and Seputuk are: (1) land is available around such communities; (2) they need to ensure a supply of food from cultivation; and (3) recently, forest communities have been able to sell surplus crops from their cultivation.

Since Punan Bengalun villagers shifted in the current place, they were active in applying shifting cultivation, both in the new *jakau* and old *jakau* in their previous place. However, the area of shifting cultivation applied by Punan Bengalun villagers has decreased since 1990s (Figure 3a).

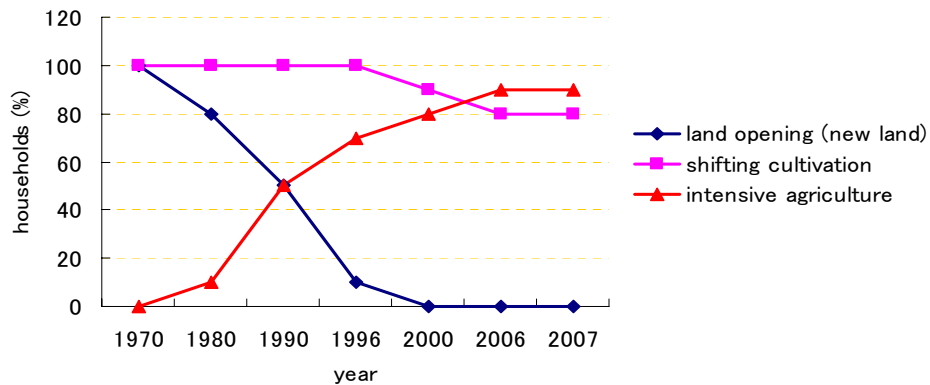
Figure 3a. Land Opening and Land-Use Management in Punan Bengalun (based on area (ha)/household/year)



Source: Interview with villagers in Punan Bengalun (2007)

Although since 1996 until 2007 the number of households who apply shifting cultivation has insignificantly decreased, most of households in Punan Bengalun are applying shifting cultivation (Figure 3b). Land-opening activity by villagers in Punan Bengalun has decreased since 1970, and this activity has faded since 2000.

Figure 3b. Land Opening and Land-Use Management in Punan Bengalun (based on percentage of household population/year)



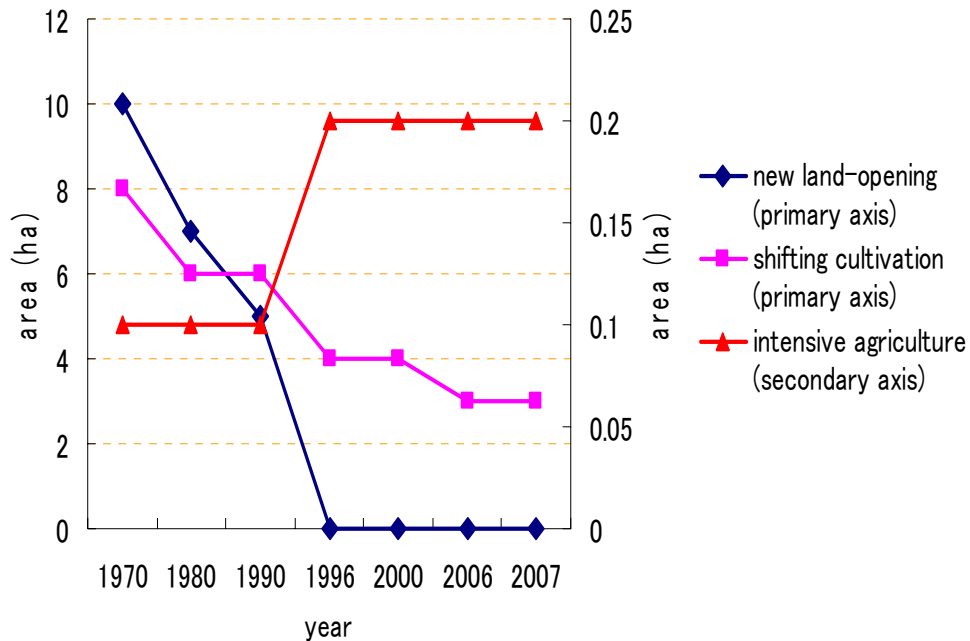
Source: Interview with villagers in Punan Bengalun (2007)

Custom of Opening Land in Seputuk and Its Utilization by Villagers

In Seputuk, intensive agriculture had started in 1945. Although the area of intensive agriculture was very small (about 0.1 until 0.3 hectares), this system has further developed since 1975. This intensive agriculture activity has provided foodstuff for Seputuk villagers. The reasons of land utilization for cultivation by villagers in Seputuk are: (1) land is available around them; (2) although they fulfill their food needs from the forest, they also need to fulfill their food needs from cultivation; and (3) recently, since the food sources in the forest have decreased, they have been able sell surplus crops from their cultivation as an additional income source.

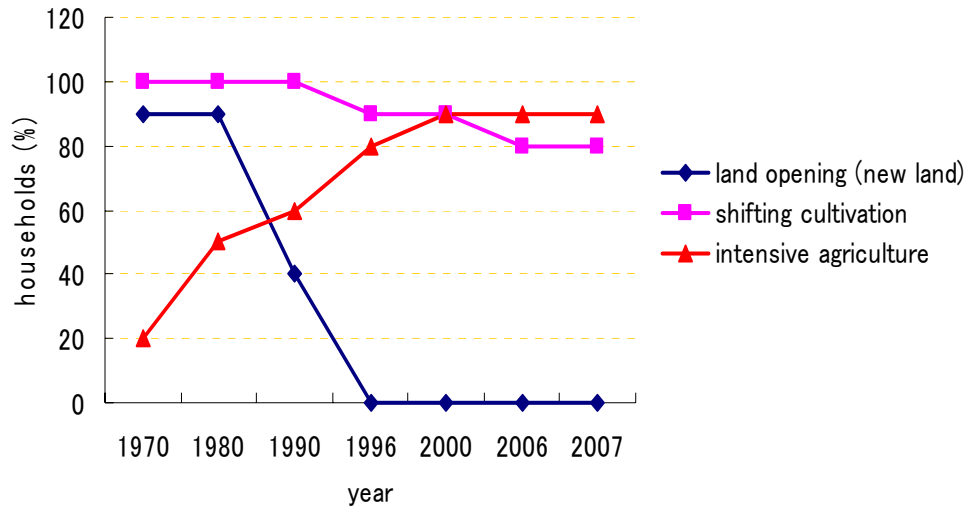
In Seputuk, the area of shifting cultivation has decreased since the 1970s (Figure 4a). Since 1996, the percentage of households who apply shifting cultivation has had a slight decrease (Figure 4b). Land-opening activity by villagers in Seputuk has decreased since 1980, and it has gone since 1996.

Figure 4a. Land Opening and Land-Use Management in Seputuk (based on area (ha)/household/year)



Source: Interview with villagers in Seputuk (2007)

Figure 4b. Land Opening and Land-Use Management in Seputuk (based on percentage of household population/year)



Source: Interview with villagers in Seputuk (2007)

Involvement of Forest Concessionaire on Land-Use Management in Forest Communities: Implementation of Social Forestry Program (SFP)

History of SFP

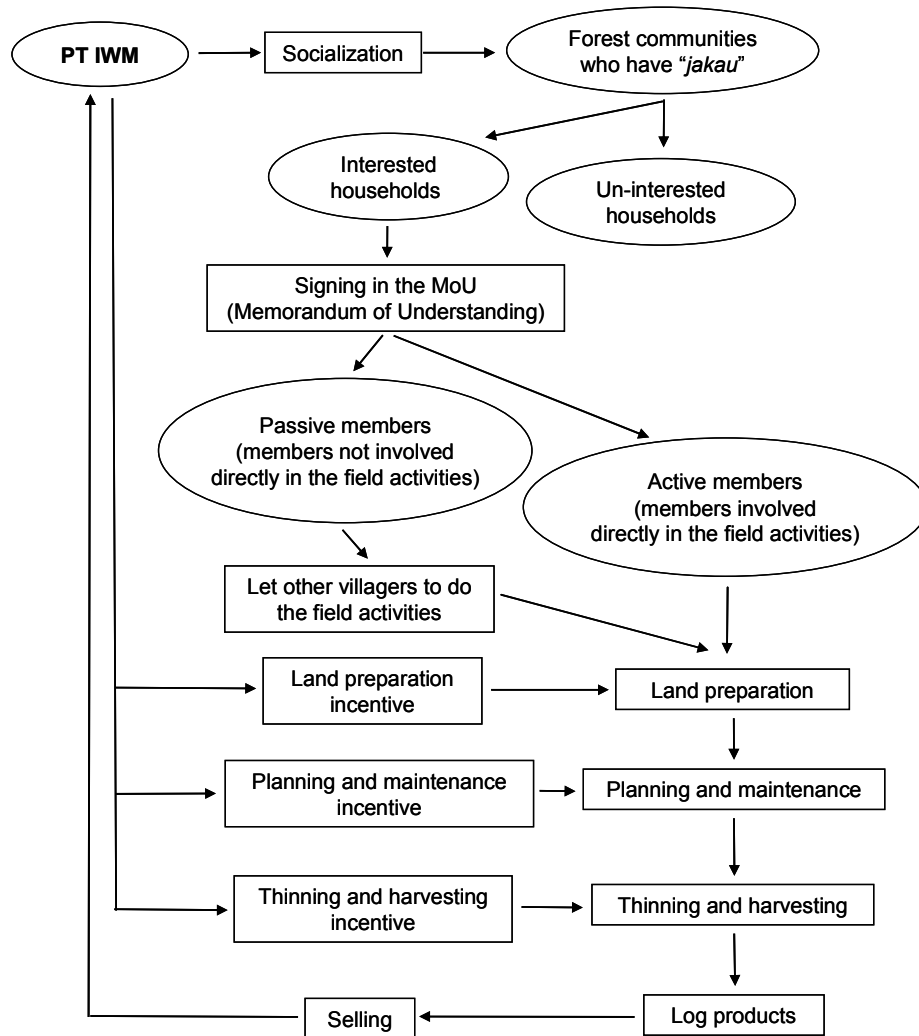
At the research site, the activity of shifting cultivation in *jakau* created fallow land. Realizing the lack of crops and timber productivity of such fallow land, PT IWM created a program to improve the utilization of these fallow lands through SFP (Figure 5), which was charged with utilizing and activating *jakau* through cooperation between PT IWM and forest communities. It was tasked with simultaneously developing forest communities' economic situations and providing wood supplies for PT IWM. The species chosen by PT IWM for this SFP was *Jabon*. The reasons for this choice were that *Jabon* was: (1) a local species; (2) a pioneer species at the study site; (3) a familiar species to forest communities in and around PT IWM forest areas; (4) often found growing naturally in *jakau*; and (5) a valuable species (an experiment conducted by PT IWM suggested that *Jabon* had economic value as a material for making plywood veneer). Before understanding the economic value of *Jabon* trees, forest communities who were finding the species on their cultivation land were used to cutting them down. By implementing SFP, it was expected that SFP would provide benefits for both PT IWM and forest communities.

Figure 5. SFP Organized by PT IWM (captured in 2007)



The program was communicated to Seputuk villagers in 2003 and commenced in 2004. The scheme of the SFP process is outlined in Figure 6. Firstly, PT IWM presented SFP to forest communities, especially to those with *jakau*, in the targeted villages. PT IWM argued that the reason for pinpointing Seputuk was that most villagers in Seputuk had *jakau* located close to the road or river. This had the advantage of PT IWM's ability to monitor SFP and eased the process of harvesting and transportation of SFP products (*Jabon* timber) to its factory. Some villagers with *jakau* in Seputuk were interested in joining SFP, and some were not. Those who were interested in SFP signed a Memorandum of Understanding (MoU) made by PT IWM (referring to SFP members), who were subcategorized as 'active' and 'passive' members. The content of the MoU was the agreement and regulation related to SFP between PT IWM and members. 'Active' members were those who are willing to use their *jakau* for SFP and to participate in field activities such as clearing and preparing land, planting *Jabon* and maintaining *Jabon* stands. 'Passive' members were those willing to use their *jakau* for SFP, but they allowed others to handle them instead of being involved in field activities.

Figure 6. Scheme of SFP Process Organized by PT IWM



Source: Interview with key informants in PT IWM (2007)

Policies of SFP Made by Forest Concessionaire

The costs of all processes related to SFP management (including the expenses incurred in land preparation, planting, cultivating and harvesting) are covered by PT IWM, which also provides incentives in cash for field activities to active members (Table 3). PT IWM does not pay anything to SFP members related to the land used for SFP. PT IWM does not provide such incentives to passive members who do not contribute to field activities. As

passive members pass the responsibility of field activities to others, PT IWM gives incentives to people who apply for field activity jobs (referred to as “workers”, i.e. villagers who do not use their *jakau* for SFP, but involve themselves in the activity of maintaining SFP stands). These workers are willing to involve themselves in SFP because they get the incentives from PT IWM for each activity related to the maintenance of *Jabon* stands. Active members and workers have the responsibility to maintain *Jabon* stands until they are ready to be harvested in the eighth year. In the harvesting process, PT IWM will provide workers with incentives to harvest timber, and will pay additional incentives to SFP members (both active and passive) for the harvested timber (IDR 800,000/m³).

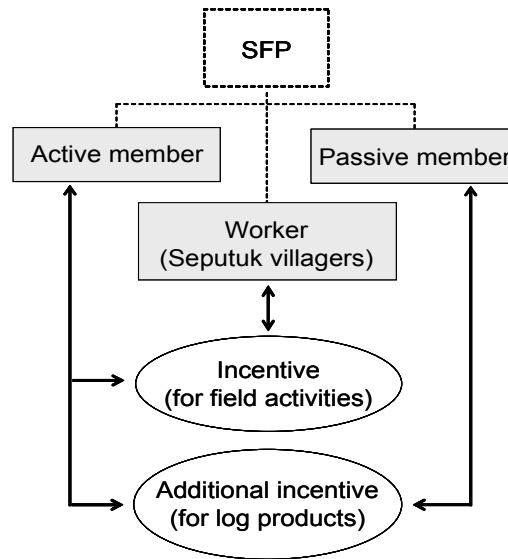
Table 3: Incentives Paid by PT IWM to Active Members and Workers during the Implementation of SFP

Activity	Cost	Payment Condition
Land area measurement	IDR 45,000/hectare	Paid by PT IWM to active members and workers
Seedling cultivation	IDR 504.5/stem	
Land preparation	IDR 500,000/hectare	
Planting	IDR 440/stem	
Maintenance		
a. Weeding	IDR 140/tree	
b. Fertilizing	IDR 140/tree	
c. Dead seedling replacement	IDR 440/tree	

Source: PT IWM 2007

In Seputuk, there are 15 SFP members, comprising 12 active members and 3 passive members. There are about 4 to 5 workers who are handling the field activities in SFP on behalf of the passive members, and all these workers are Seputuk villagers. In SFP, the active members will get both of incentive from field activities and additional incentive from selling the *Jabon* timber. The passive members will get only the additional incentive when selling the timber in the 8th year. Meanwhile, the workers will get only the incentive during field activities (Figure 7).

Figure 7. Incentive System in SFP Organized by PT IWM



Source: Interview with key informants in PT IWM (2007)

For SFP, seedlings are prepared by PT IWM in a nursery. At the beginning of *Jabon* plantation in SFP, about 300 *Jabon* seedlings are planted for every 0.5 hectares of *jakau*. During maintenance, thinning is performed in *Jabon* stands so that high-quality timber (i.e. straight logs) is produced by the eighth year. These research results suggest that SFP is implemented in *jakau*, of which the majority is located in secondary forest areas around PT IWM-managed forests and a few is located inside PT IWM forest areas.

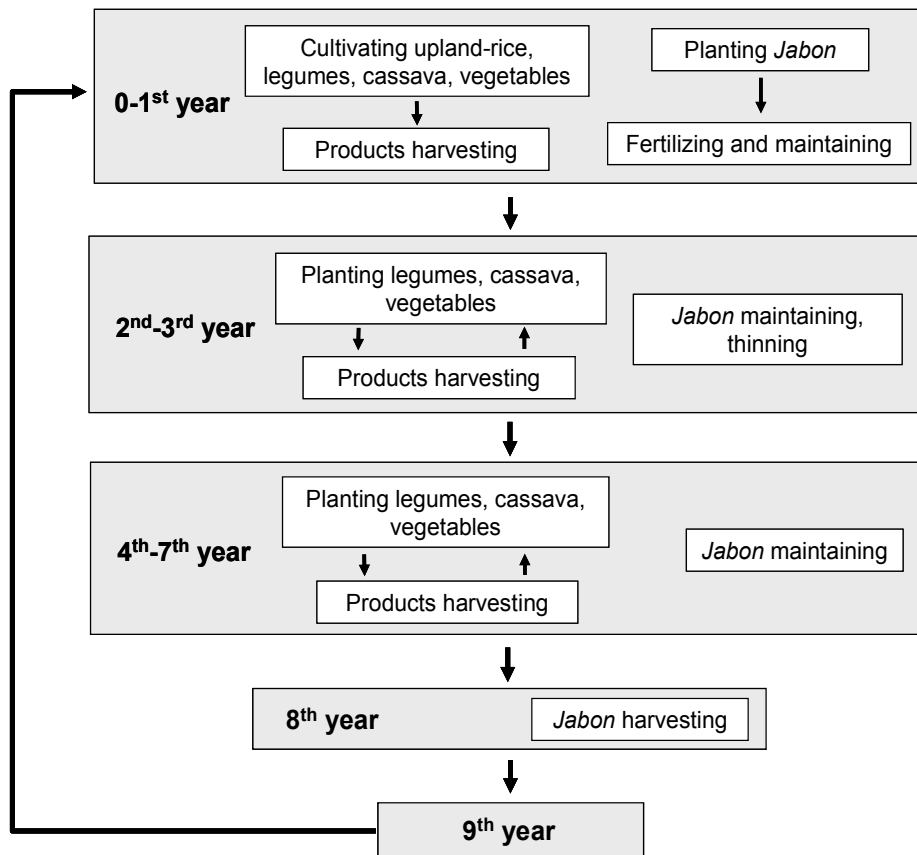
Prevailing System of SFP

In SFP, *Jabon* has a rotation cycle of eight years. Forest communities whose *jakau* are utilized in the program are counted as SFP members. Plantation rotation under SFP is outlined in Figure 8. SFP members plant upland-rice and *Jabon* together at the same time (rotation cycle 0 - 1st year) on the same land. In the fertilization of soil for *Jabon* trees, it is expected that the fertilizer will naturally spread and help upland-rice too, thereby benefiting both *Jabon* trees and upland-rice. After upland-rice has been harvested, the same land can be utilized to plant other vegetables, until the rotation of *Jabon* reaches about three years (2nd - 3rd years). Since the 2nd year, the thinning of *Jabon* trees is done so that the vegetables can be planted. After three years of rotation, the pruning of *Jabon's* crowns is done so that the vegetables can grow as well (4th - 7th years). *Jabon* trees are harvested after eight years of rotation

(in the 8th year). After this harvesting, plantation rotation is repeated from the first step (in the 9th year).

The system of planting upland-rice and vegetables on the same land together with wood trees (*Jabon*) provides benefits for both PT IWM and SFP members. In the first year, members can harvest the upland-rice, legumes, cassava and vegetables. In the next period – the second to the third year – they can harvest legumes, cassava and a variety of vegetables. In the next period – the fourth to the seventh year – they can harvest legumes, cassava and vegetables. In the eighth year, they can harvest the *Jabon* and sell all timbers to PT IWM. During the eight-year rotation, SFP members willing to participate in the program’s activities also receive additional incentives from PT IWM. In the eighth year, PT IWM collects timber from SFP plots through its clear cutting system.

Figure 8. Scheme of Activities on SFP



Source: Interview with SFP members in Seputuk and PT IWM staff as a SFP organizer (2007)

Implementation of SFP in Seputuk

Members of SFP, area for SFP and the Implementation of SFP in the Field

Most of SFP members in Seputuk decided to involve themselves in SFP because they were promised cash profits. The land-related benefit of SFP participation is the improvement of land condition. Planting trees in fallow land is a good way to maintain environmental balance. Meanwhile, from the viewpoint of SFP members, they joined the program for cash income and agreed that SFP provides a chance for forest communities to work through the activities of the program, such as preparing land, planting, planning, maintaining, thinning and harvesting – tasks for which PT IWM provided incentives to workers (Table 7). Even communities without *jakau* who want to be involved in SFP can apply to work on activities related to land preparation until tree harvesting.

Obstacles Occurred during SFP Implementation

After four years of operation since the implementation of SFP in 2004, many obstacles related to the implementation of SFP occurred. These include: (1) *Jabon's* growth failure in the field; and (2) the need for extra expenditures by SFP members to maintain *Jabon* stands, as sometimes the incentives from PT IWM were not enough. This condition has raised doubts about the tenability of SFP. Realizing the failure of *Jabon's* growth in the field, SFP members have become anxious about the success of the program. The results of the interviews with SFP members show that they hope to gain more crops from their *jakau* and sell them to the market for income in anticipation of SFP's failure.

An opinion poll of SFP members indicates that some believed that PT IWM had paid enough attention to their needs in optimizing their *jakau* through SFP. However, other members argued that PT IWM has been inconsistent with overseeing the success of the program; that during the process of maintaining *Jabon* trees, the budgets from PT IWM for SFP members were insufficient to maintain *Jabon* stands so members had to pay the shortfall themselves for this maintenance. At the beginning of SFP implementation, PT IWM provided guidance and assistance to members regarding the implementation of the program. However, PT IWM does not provide such guidance/assistance or program extension to SFP members anymore during the period of *Jabon* stand maintenance. As a result, members lost their desire to keep performing such maintenance. It is therefore clear that there is a need for guidance/assistance and program extension from PT IWM to SFP members from the beginning until the end of the program.

Advantages and Disadvantages of SFP Implementation from the Viewpoint of SFP Members

The implementation of SFP in forest communities has advantages and disadvantages, as Jong (1997) mentioned that social forestry programs (programs for the development of wasteland by planting trees) are still weak. The advantages of SFP implementation in Seputuk include: (1) improving the land-use management through fallow utilization; (2) building much better relationship between organizer (PT IWM) and forest communities (Seputuk villagers); and (3) improving the ecosystem balance.

Meanwhile, the disadvantages of SFP implementation in Seputuk are: (1) the program is not yet implemented in all villages in and around PT IWM, which caused social jealousy among other villagers; (2) the rotation of upland-rice plantation in SFP is longer than that in shifting cultivation, which forces members to supply the rice from other sources (such as buying in the market or in other villages) when they do not have more stocks; (3) SFP is done only in the *jakau* which is located close to the road or river; and (4) lack of guidance from the organizer.

Loss and Benefits of SFP Implementation: from the Viewpoint of Forest Concessionaire and Members of SFP

One benefit of the implementation of SFP is the chance for SFP members to get more income by selling *Jabon* timber to PT IWM in the harvesting season. By joining SFP, villagers will be able to utilize their fallow more efficiently. Cooperation between PT IWM and villagers in implementing SFP is expected to provide support for household incomes. Since PT IWM has taught residents the value of *Jabon*, the species is kept when these villagers are clearing *jakau*. This development represents new and positive action related to forest conservation.

The loss of SFP implementation is that members have to pay an additional fee for maintaining the *Jabon* stands. The incentive given by organizers is insufficient for maintaining the *Jabon* stands. Therefore, when *Jabon* stands need an extra treatment, SFP members have to handle it by themselves.

Conflicts Appeared within Villagers in Seputuk Related to SFP

Not all villagers in Seputuk have chance to join with SFP because not all the villagers have *jakau* close to the road or river. Although this SFP is only implemented in *jakau* near the road or river, communities with *jakau* far from these areas do not consider it as unfair treatment by PT IWM. Even now, not all forest communities with *jakau* near the road or river are willing to join the program, as they want to monitor the success of other participants first. This shows that forest communities, like human beings everywhere, consider joining the program typically if it provides some kind of benefit or profit for

them. There are some villagers who have chance to join with SFP, but are not interested in joining it because they prefer applying shifting cultivation and intensive agriculture. Although there is "social jealousy" among villagers who do not have chance to get involved in SFP, conflict which appears related to SFP implementation is not a big issue. The organizer gives a chance to the villagers who do not have *jakau* close to the road or river to join in SFP as a worker (as explained above) who represents passive members in maintaining the *Jabon* stand.

Land-Use Management System in Punan Bengalun (without SFP) and Seputuk (with SFP)

In Punan Bengalun, in which the villagers are not involved in SFP, the land utilization for planting upland-rice in every 1 hectare area of *jakau* (based on households interview) is about 50% of space. However, in the *jakau* where SFP is implemented, the percentage of space for planting upland-rice in every 1 hectare of *jakau* is about 35-40%. In the implementation of SFP, the planting patterns among upland-rice, legumes, cassava, vegetables, fruits and *Jabon* need a better arrangement so that by planting *Jabon* in the *jakau*, the space for other plantations does not decrease. Based on the interview of SFP members in Seputuk, they argue that by applying SFP in their *jakau*, the rotation of planting upland-rice is longer than applying shifting cultivation. They have to provide rice for consumption from other *jakau* or other sources such as buying from market or from other villagers. It means that at the same time, such alternatives work other than SFP need organizing to increase their cash-earned.

There is no significant difference of products from land-use activities in Punan Bengalun and Seputuk. Villagers in Punan Bengalun produce upland-rice and vegetables (such as corn, cassava, chili, peanuts, lemon grass, pumpkins, cucumbers, taro, green mustard, eggplant, coffee, spinach and long beans) from the shifting cultivation and intensive agriculture. In Seputuk, villagers who are joining SFP can produce upland-rice, vegetables and *Jabon* timber. The products produced by villagers in Punan Bengalun and Seputuk from the land-use activities are similar.

Villagers in Punan Bengalun are aware of the forest preservation. In every land-use activity, Punan Bengalun villagers always consider not to destroy the natural resources, including forest. Shifting cultivation is done by considering the ecosystem balance. They have never cleared forest excessively when opening any new land. In clearing the old *jakau* for cultivation, they always carefully do the activities of slashing and burning the shrubs and branches so that it will not harm other areas around it. They argue that their custom on land-use management and their land-use application for cultivation are based on the environmental balance consideration. They live in

the forest since long ago and believe that the forest is their house, so that they are used to taking care of it.

Villagers in Seputuk do also care about forest preservation. They never destroy the natural resources environment, including forest, by never doing any activity excessively against land-use. They properly utilize land-use for cultivation and carefully prepare land so that it will not harm any other area. The attitudes of villagers in Punan Bengalun and Seputuk towards the land-use management system are not significantly different.

In relation to land-use activities, income for villagers in Punan Bengalun and Seputuk is derived from selling surplus crops. They are used to planting vegetables and fruit trees in their *jakau* since the availability of edible plants and fruits in the forest decreases. The main purpose of planting those vegetables and fruit trees is to produce foods for them, but in fact, sometimes they sell its products to earn cash to buy rice and other basic needs. The income source related to land-use among Punan Bengalun and Seputuk is not significantly different. The only difference is that in Seputuk, some villagers who become SFP member, have an additional income from the incentive paid by PT IWM and from selling *Jabon* timber to PT IWM.

Conclusion

Compared to a few decades ago when such villagers stayed in previous locations in remote areas, the intensity of the land opening custom in Punan Bengalun and Seputuk has declined regarding the land availability. The land availability for forest communities is limited, while this land is very important to produce crops for forest communities. It is necessary for villagers and other stakeholders (such as NGOs, local government, forest concessionaires and conservation groups) to work together for improving the land-use in forest communities for producing more land products, better income sources and to protect the future of natural resources. Forest communities should optimize their own capability on forest resources utilization by utilizing their local knowledge and respecting the environments as their livelihood.

In the implementation of SFP in forest communities, PT IWM and SFP members have to maintain close mutual understanding to avoid the emergence of new problems. Both parties should be fully aware of their rights and obligations in regard to the implementation of the program. The understanding between PT IWM and SFP members will stave off the emergence of conflict in the event of SFP failure. Forest concessionaires are challenged to contribute to the success of SFP in forest communities, as SFP has a big chance to be developed for long-term FCDP (Forest Community Development Program) and also for income source in forest communities. However, as the forest community is the one which knows the most important needs to improve its own living standards, new paradigm and

strategies of on forest communities' needs-based programs are necessary to be developed. The policy of these programs should guarantee the benefits for forest communities (Nanang *et al.* 2006).

This research was conducted in a culturally specific and geographically localized of forest communities. The activity of land-use in forest communities relies on some factors such as natural vegetation, communities' traditions, involvement of outsiders and historical environmental conditions. The study of Sulistyawati *et al.* (2005) indicated that maintaining shifting cultivation is an "option" rather than totally replacing shifting cultivation with cash-cropping. Meanwhile, villagers in Punan Bengalun and Seputuk are willing to engage in intensive agriculture both in their home gardens and *jakau* and sell the crops to the market for income sources. However, villagers in Punan Bengalun and Seputuk realize that crop marketing is not so easy and argue that they encounter many obstacles, including: (1) a lack of knowledge regarding marketing systems; (2) a lack of experience of producing crops in bulk; and (3) a lack of information of how to begin and how to develop plans for crop marketing. It must be recognized that the more serious involvement and stronger efforts of forest concessionaires (as stakeholders which directly interact and are physically close to forest communities) to improve the natural resources utilization in forest communities, including land-use management, are necessary. This involvement must be well coordinated with forest communities.

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References

- Abdoellah, O., Lahjie, A. B., Wangsadidjaja, S. S., Hadikusumah, H., Iskandar, J. and Sukmananto, B. 1993. *Communities and Forest Management in East Kalimantan: Pathway to Environmental Stability*. Southeast Asia Sustainable Forest Management Network. Research Network Report, No. 3, August 1993.
- Basuki, H. 2005. *Kasus Tenurial dan Konflik di Areal Pengusahaan Hutan* (in Indonesian). Intracawood Manufacturing, East Kalimantan.
- Basuki, I., and Sheil, D. 2004. *Prioritas Masyarakat Lokal dalam Pengelolaan Sumberdaya Lahan Hutan di Hulu Sungai Malinau, Kalimantan Timur* (in Indonesian). Environmental Services and Sustainable Use of Forests Programme, Center for International Forestry Research (CIFOR).

- Byron, B., and Arnold, M. 1999. "What Futures for the People of the Tropical Forest?". *World Development* 27 (5): 789-805.
- Brady, N. C. 1996. "Alternatives to slash-and-burn: a global imperative". *Agriculture Ecosystem & Environment* 58 (1996): 3-11.
- Crevello, S. 2004. "Dayak Land Use Systems and Indigenous Knowledge". *J. Hum. Ecol.*, 16 (2): 69-73.
- DTE (Down to Earth). 2006. *Forest Policy and Indonesia's Natural Resources Crisis: a View from Jakarta*. Down to Earth (70), August 2006.
- Intip. 2003. *Konflik Antara Masyarakat Sekitar Hutan, Masyarakat Adat dan Perusahaan Pengusahaan Hutan* (in Indonesian). May-July 2003.
- Jong, W. 1997. "Developing Swidden Agriculture and the Threat of Biodiversity Loss". *Agriculture, Ecosystem and Environment* 62 (1997): 187-197.
- Nanang, M., Hyakumura, K., Harada, K., and Inoue, M. 2006. "Patterns of Behaviour in Local Forest Management: Case Studies from Indonesia and Laos". *Socio-Humanities* 1 (1): 55-65.
- PT IWM (PT Intracawood Manufacturing). 2007. *PT Intracawood Manufacturing: Forestry Division* (document, not published).
- Rao, V. I. N., and Ramana, G. V. 2007. "Indigenous Knowledge, Conservation and Management of Natural Resources among Primitive Tribal Groups of Andhra Pradesh". *Anthropologist Special Volume* 3 (2007): 129-134.
- Sheil, D., and Liswanti, N. 2006. *Scoring the Importance of Tropical Landscapes with Local People: Patterns and Insights*. Center for International Forestry Research (CIFOR).
- Sudewi. 2007. *Urgensi Paradigma dan Tata Pemerintahan yang Lebih Bijak* (in Indonesian).
- Sulistyawati, E., Noble, I. R. and Roderick, M. L. 2005. "A Simulation Model to Study Land Use Strategies in Swidden Agriculture Systems". *Agricultural Systems* 85 (2005): 271-288.
- Suwarno, A., and Campbell, B. 2005. *Modeling the Dynamics of Landscapes and Livelihoods in Malinau District, Indonesia*. Proceedings of the MODSIM 2005 International Congress on Modeling and Simulation Society of Australia and New Zealand, Melbourne, 12 - 15 December 2005.
- Weinstock, J. A., and Sunito, S. 1989. *Review of Shifting Cultivation in Indonesia*. Directorate General of Forest Utilization, Ministry of Forestry, Government of Indonesia and FAO, Jakarta.
- Wollenberg, E., Iwan, R., Limberg, G., Moeliono, M., Rhee, S. and Sudana, M. 2007. "Facilitating Cooperation During Times of Chaos: Spontaneous Orders and Muddling Through in Malinau District, Indonesia". *Ecology and Society* 12 (1): 3.
- Wollenberg, E., Campbell, B., Dounias, E., Gunarso, P., Moeliono, M. and Sheil, D. 2009. "Interactive Land-Use Planning in Indonesian Rain-Forest Landscapes: Reconnecting Plans to Practice". *Ecology and Society* 14 (1): 35.