

RICH GARDENS, POOR FOREST? CASE STUDY IN CENTRAL JAVA

Yosei Oikawa*

1. General description of the research sites

The island of Java is known as a densely-populated. Local people of Java have developed intensive paddy and upland agriculture on their small but fertile lands. Because of conversion into agricultural lands, forests in Java decreased to about 20 % of the total area of the island by the middle of the 20th century. At present, except for state forests and plantations, land use of rural Java consists mainly of paddy fields, homegardens, and dry-fields. The dry-fields are planted not only with annual crops but also with various perennials. When perennials are dominantly mixed-planted, the dry-fields form "mixed gardens".

In total area of the island, paddy area covers 27 % and homegardens does about 14 % (BPS, 1997). Added to the area of mixed gardens, that is a part of dry-fields (25%: BPS, 1997), the area covered by perennial crops reaches more than 20 %. In some cases in Central Java, the area of homegardens occupies more than 50 % of total area of the village. Thus, land use of Java is characterized by relatively large area of mixed gardens and homegardens.

State forests in Java are clearly bordered on villagers' lands, and managed by the State-Forestry Corporation, "Perum Perhutani". Perhutani has successfully introduced Tumpangsari afforestation system to establish new forest stands by residents' participation under different ecological and socioeconomic conditions in parts of Java (Masuda 1987). This silvicultural system, however, has the weakness that the cultivable period is limited to only a few years. If there are no more lands to be cultivated in the village, participants must move their fields in the Tumpangsari site to other places, or cannot help stopping cultivation until next afforestation is carried out.

Except for the early stage of Tumpangsari afforestation, villagers can sometimes earn their living by contract with Perhutani. They can also frequently collect firewood, grass and other forest products in the forests in a legal or illegal way. For the villagers who have lost their working opportunities, forests are attractive resources which they can easily access. This is probably the beginning of conflicts between villagers and Perhutani.

In this section, a preliminary field work in Banyumas regency, the province of Central Java, is described to explore a possibility to develop a participatory management system which contributes toward reducing conflict between villagers and Perhutani.

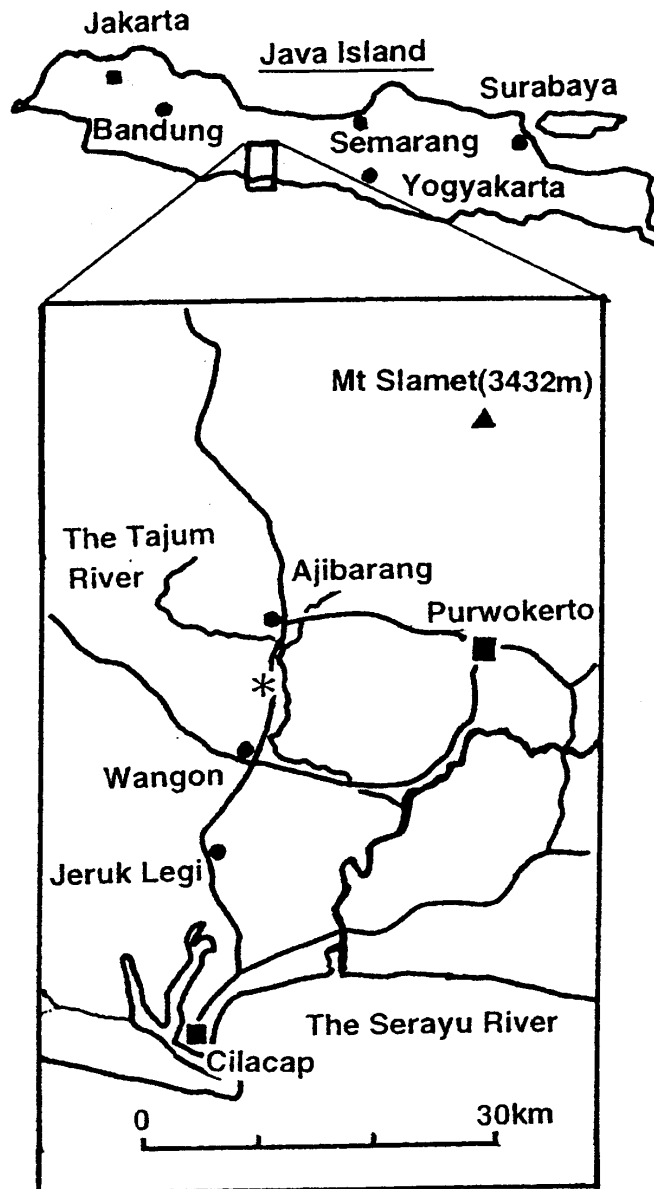
There are two reasons for selecting the Banyumas regency as a research site.

First, conflicts between Perhutani and villagers exist. Villagers have lived with small lands and limited working opportunities.

Second, in the Banyumas regency, there are some deforestation sites caused by the residents' activities, especially by firewood collection for coconut-sugar making. Because coconut-sugar making has been an important livelihood in this region, large amounts of firewood for boiling coconut flower sap have been required. Although limestone burning (Bolnick 1982) and the making of tile and bricks also require much firewood, in this region, coconut sugar making has a greater impact on the forests.

Coconut sugar making is an intensive way to utilize homegardens. It brings the highest income per hectare in case of a village in Yogyakarta (Penny and Singarimbun 1973). In order to increase coconut-sugar production, villagers in Banyumas have procured firewood in their homegardens and mixed gardens. When they cannot fulfill the need in their village, they must spend many hours in the forests to collect dead trees and fallen branches and bring them back.

* Research Fellow in 1997-98, Center for Southeast Asian Studies, Kyoto University Kyoto 606-8501 JAPAN. From April 1999: Non-Profit Research Staff, Laboratory of Tropical Forest Resources, Division of Forest Science, Graduate School of Agriculture, Kyoto University, Kyoto 606-8502 JAPAN Tel. 075-753-6361 / Fax. 075-753-6372 / Home. 075-723-2046



* : Research Site

Figure 1. Research Site

The problem happens when villagers cut living trees in the forests. In fact, as the result of over-cutting for firewood, some hills in this area have become barren of trees (Hardjosoediro 1980 & 1982; Oikawa

1998). Thus, this case is characteristic of the utilization of homegardens. Locals have consumed forests to increase outputs of their homegardens. The problems in the research site, however, are not limited to the firewood problem, but includes illegal cultivation and illegal logging by villagers.

Forest setting and other land use in Banyumas regency

Banyumas regency (Kabupaten Banyumas) is one of the regencies forming the old Banyumas residency ("Karesidenan Banyumas"). In this section Banyumas residency is regarded as Banyumas region ("Daerah Banyumas").

In Banyumas regency, about 18 % (24,995 ha in 132,759 ha) of the total land is managed by Perhutani. The forests are divided into two Forest Management Districts (KPH: Kesatuan Pemangkuan Hutan): East Banyumas Forest Management District covering Banjarnegara, Purbalingga, and eastern part of Banyumas and Cilacap regencies, and West Banyumas Forest Management District covering western part of Banyumas and Cilacap regencies. The area of each KPH in Banyumas region is shown as Table 1.

Table 1. Area of Forest Management Districts* in Banyumas region (in hectare)

	Cilacap	Banyumas	Purbalingga	Banjarnegara
East Banyumas FMD	1,853	**18,396	***14,401	****11,824
West Banyumas FMD	49,380	6,599	-	-
Total	51,233	24,995	14,401	11,824

Source: Kantor Statistik Kabupaten Banyumas (1997), p.166 &169.

* : Conservation area under the control of Department of Forestry is not included.

** : Including 170 ha of Protected Forest (Hutan Lindung).

***: 3,515ha of Protected Forest. 10,887ha of Production Forest.

****: 2,511ha of Protected Forest. 9,313ha of Production Forest.

Most forests in Banyumas regency are categorized as production forest ("Hutan Produksi"), and managed as industrial forest plantations. "Jati" (teak, *Tectona grandis*) and "Pinus" (pine, *Pinus merkusii*) are mainly planted there. These forests are distributed in hilly or mountainous areas. Parts of hills in the vicinity of the boundary of Banyumas and Cilacap regencies are also used as rubber plantations.

As shown in Figure 2, land use in Banyumas regency consist mainly of paddy ("Sawah"), homegardens ("Pekarangan"), dry-fields ("Tegalan" / "Kebun"), and tree gardens ("Tahah yang ditanami Kayu-kayuan" / "Hutan Rakyat"). While state forests cover less than 20 % of the total land of Banyumas regency, the area covered by trees or tree crops in private lands amounts more than one fourth of the regency. Thus, homegardens and other tree-oriented land uses are well-developed in this regency.

Banyumas regency has two centers of coconut-sugar production: Cilongok and Wangon. Both are capital town of subdistrict (Kecamatan). In the Cilongok subdistrict, upland area is mostly covered with thick volcanic soil (the depth is more than a few meters), and used as homegardens and mixed / tree gardens. Wangon subdistrict is surrounded by the hills of which most parts belong to state forests.

Windunegara village (Wangon subdistrict, Banyumas regency)

Windunegara village (Desa Windunegara) in the north of the Wangon subdistrict was chosen as a research site because deforestation sites were observed in this village. Many villagers are engaged in coconut-sugar making.

The village are located in the Tajum valley between two ranges of hills. The main hamlet of this village is located on the right (west) bank of the Tajum River. The provincial road linking Tegal and Cilacap cuts through the main hamlet.

The forests on the west of the main hamlet belong to the West Banyumas Forest Management District (KPH Banyumas Barat). The highest hill is Hill Tugel (Gunung Tugel), about Figure 2. Land

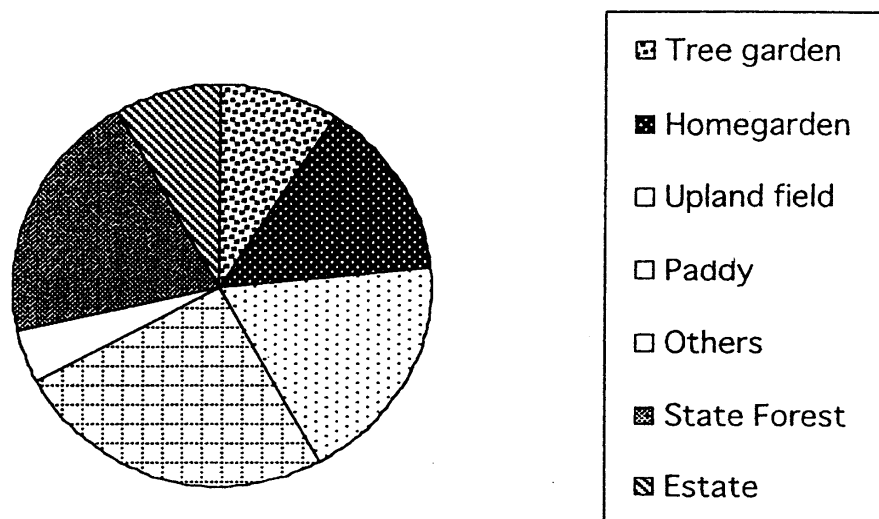


Figure 2. Land Use of Banyumas Regency

Source: Kantor Statistik Kabupaten Banyumas 1997: 4-9

300 m above sea level. The main hamlet and Karangkamal, another hamlet of Windunegara, are about 30 to 40 m above sea level.

Karangkamal hamlet, a small-scale hamlet in Windunegara village, is focussed on in the following. This hamlet is located on the left (east) bank of the Tajum, and less than 1 km to the east of the main hamlet.

Because the bridge in the neighboring village has been recently broken by a flood, there is no bridge to cross the Tajum river near the village. In the rainy season, villagers (sometimes with bicycles or motorcycles) must cross the river by bamboo raft at the crossing points in the neighboring villages. Cars must follow an indirect route through the upper subdistrict.

Karangkamal hamlet is also located at the foot of barren hills. The state forest behind the hamlet belongs to the East Banyumas Forest Management District (KPH Banyumas Timur). The highest hill is named "Gunung Putri", and its peak is about 450 m above sea level.

Since teak afforestation was conducted by Tumpangsari method in 1997/98, the lower half of the hillsides has been planted with teak and palawija crops (secondary upland crops such as cassava, maize, groundnut and sweet potato).

Population:

The village population in 1990 was 3,317 in 739 households (BPS-Banyumas, 1991). According to the hamlet head, the population of Karangkamal in 1998 is about 370 in 86 households. Rice cultivation in small paddy fields and coconut-sugar making in homegardens are main livelihoods of the residents. Many young men (teenagers and men in their twenties) are, however, not engaged in

these livelihoods and have worked in Jakarta.

Administrative organization

Administrative organization in the village is basically the same as that in other research sites in Indonesia.

2. Customary forest (or land) management system

Land categories recognized by the residents

Based on the interviews conducted in 1994, the residents have roughly recognized some land categories. Most among the following terms are originally Javanese, but have become Indonesian terms with some shades of meaning. The residents sometimes do not clearly distinguish these Javanese and Indonesian terms. Therefore, the following definitions are not necessarily recognized by all residents.

"Pekarangan"(Javanese & Indonesian): Homesteads (houses and homegardens) usually planted with various perennial and annual crops. Cf.) In a narrow sense in Indonesian, Pekarangan only means a yard.

"Kebun" (Indonesian): Mixed gardens. Dry-fields mainly planted with perennial crops. In this regency, Kebun is usually adjacent to Pekarangan. Cf.) "Kebon" in Javanese has a comprehensive meaning of gardens including annuals, perennials, or mixed dry-fields. Tegalan, Kebun and Pekarangan are included in this term. Most residents also understand the meaning of Kebun in Indonesian. Some Javanese in other region, however, say that when they hear the Indonesian term of Kebun, they imagine "Perkebunan" (large scale plantations / estates) that term is derived from Kebun.

"Tegalan": Tegalan in Indonesian is dry-fields mainly planted with annual crops. That in Javanese means dry-fields divided from Pekarangan.

"Sawah": Paddy fields. Irrigated paddy fields are cultivated twice a year. Some farmers in Karangkamal cultivate rain-fed paddy fields once a year.

Pieces of pekarangan and kebun form a cluster of homegardens covering each hamlet. Therefore, these two categories are regarded as homegardens. Coconut trees for sugar making are planted there.

There is another land category, known as "Péréng" to some residents. These are dry-fields on the slopes. These are mostly terraced and take the form of mixed gardens. In 1994, 40 % of the 50 sample households owned Péréngs, each was less than 0.5 ha per household. Péréng is divided into various plots of mixed gardens characterized by species composition as follows (Oikawa 1998):

1) Silviculture type: This consists mainly of timber species such as Mahoni (= mahogany, *Swietenia sp.*), Sengon (*Paraserianthes falcataria*), teak, and Sonokeling (= Eastern Indian rosewood, *Dalbergia latifolia*).

2) Firewood type: Small plots consist mainly of Kaliandra (*Calliandra sp.*) and Serisida (*Gliricidia sepium*).

3) Perennial crop type: This is composed mainly of perennial crops such as coconut, banana and clove.

4) Annual crop type: Small plots for annual crops such as maize, cassava, soybean, winged bean (*Psophocarpus tetragonolobus*) and other vegetables.

"Ladang" is a common Indonesian term that means temporary annual crop fields far from the hamlet. Ladangs are mostly opened on the slopes near / in the state forests. If the land is cultivated sequentially, it becomes Tegalan.

Upper hillsides belonging to state land are called "Alas" (forest in Javanese). This category has no relation to a forest cover, and includes both "Padang Rumput" (grasslands in Indonesian) and "Hutan" (woodlands / forests in Indonesian). "Hutan Negara" (state forest in Indonesian) is also common among the residents.

Village land use is shown in the Figure 3. Except for the pine stands remaining on the upper parts of the western hills, land use pattern of the west side of the main hamlet is basically the same as of the east side of Karangkamal. The state forests, "Alas", is covered with grasses and bushes. Lower parts of the hillsides are villagers' private mixed gardens, "Péréng". Villagers make coconut sugar in their homegardens on the flat lands.

Soil category

The geological map of Java and Bali in the book of "Ecology of Java and Bali" (Whitten et al. 1996: 92-93), which is drawn after RePPProT(1990), suggests that the research site is located in the Tertiary sedimentary.

According to the hamlet head, the hills behind of Karangkamal are covered with "Tanah Wadas Putih". Tanah is soil. Wadas (=Cadas) is a hard stratum or sedimentary rock and Putih is white. Therefore, this type of soil is formed of sedimentary white rocks. Though Peluso has mentioned that the environmental conditions in which teak grows best are relatively unfavorable land to agriculture in Java (Peluso 1992: 21), the Tumpangsari plots established in 1997 have shown that both annual crops and teak seedlings have grown well there.

Land tenure system by land category, including the distribution of the rights to forest and land within communities of forest users and among communities of forest users

The land of Windunegara village consists of private lands, village lands ("Tanah Bengkok" and "Tanah Kas"), and state lands. Tanah Bengkok is mostly used as paddy fields, its usufruct is given for executive positions of the village administration, such as village head, secretary and other chiefs of divisions. Tanah Kas is the land used for village finance. Profit from harvests on the lands is added to the village finance.

Most private lands in the village are owned by the villagers themselves. The result of the household survey in 1994 shows that more than half of households in Karangkamal own less than 0.1 ha (Oikawa 1998). Each of their small lands is Pekarangan, mostly planted with coconut palms and other annual and perennial crops near the houses concrete-walled. Villagers who do not own homesteads build their houses on their parents' or relatives' lands. This relation is called "numpang", which means "join with others" or "live together".

Even if their land of 0.1 ha is a rice paddy, they can not harvest sufficient rice for self-consumption from the paddy. In order to gain sufficient harvests, some smallholders lease paddy fields from others who own larger fields. Taking Tegalan (dry-fields) on lease is rarely seen in the hamlet. There are also landless people in the village. Most of them are non-agricultural laborers.

In the state forests, villagers are never given usufruct of the forest lands except for joining Tumpangsari afforestation. They can, however, collect fallen branches and dead trees as firewood.

Usufruct of trees

A. Trees in the Forests

The residents do not have any types of usufruct of living trees in the state forests. Only fallen branches and dead trees are collected there. Whenever pruning, thinning, or harvest is done, they can collect scraps of wood. In fact, however, some of them cut even living trees in the forests to fulfill their fuel needs and to gain additional income.

It was observed that three or four villagers collected teak leaves as a wrapping material in the state forest in other village of Wangon subdistrict, and carried them to the market in Wangon by pickup. The researcher could not determine whether they had any permission from Perhutani, or not¹.

B. Trees in the Village, especially usufruct of Coconut trees

In Banyumas region, there are several types of usufruct of perennial crops, especially of coconut palm used for coconut-sugar making² as an important source of income (Oikawa 1998).

The residents who do not have sufficient coconut trees for sugar making can assure their

¹ Peluso has reported that villagers are allowed to collect leaves from teak trees over ten years (Peluso,1992:136).

² Coconut sugar is made from coconut flower sap. Every morning and late afternoon, tappers climb coconut trees to collect the sap from the inflorescences. Because a mature coconut tree has usually two inflorescences, two bamboo containers called "ponkor" are set to the inflorescences. Whenever tappers change the pongkors, they slice the top of the inflorescences with a sickle so that the sap oozes out continuously. Tapping from an inflorescence is continued for several weeks. (Oikawa 1998)

living by "Maro" (sharecropping) of coconut trees or other contract types.

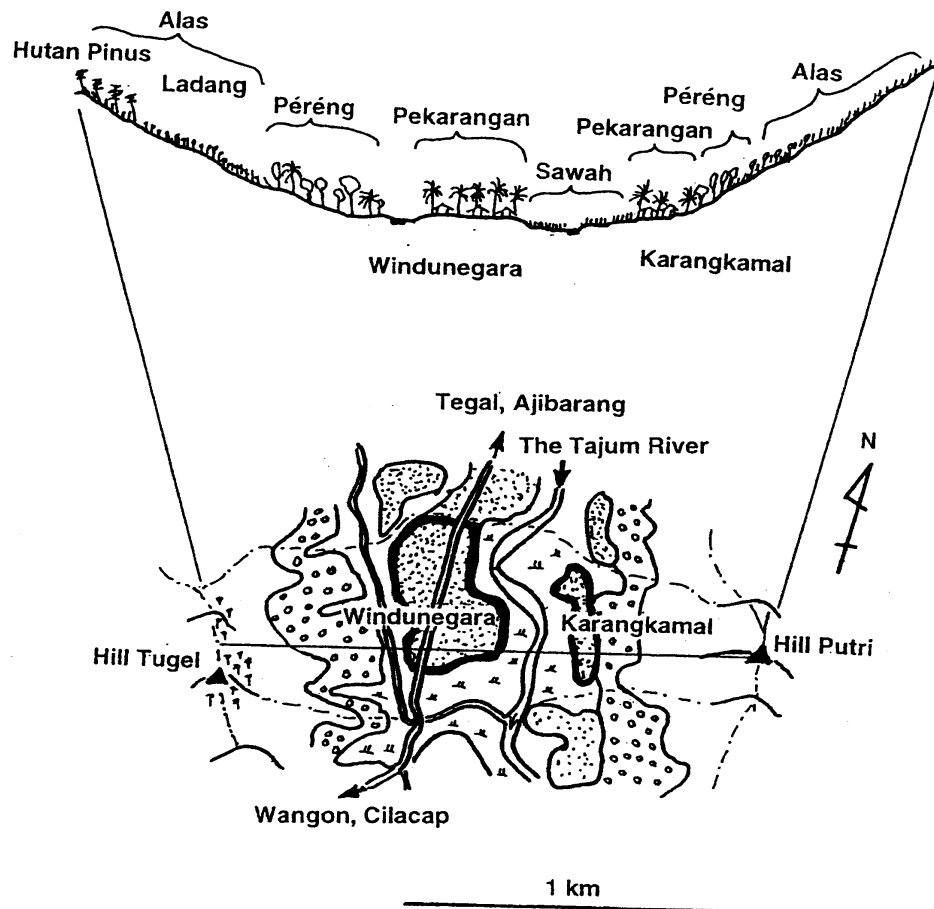


Figure 3. Land Use Pattern of Windunegara Village

"Maro" is the most common type of contract to use the coconut trees owned by other villagers. A tapper harvests the owner's coconut trees for the period of 2 or 3 days. For the next period, the tapper gives all the sap he harvests to the owner. These two periods are repeated alternately.

In the case of "On-an" (paying per "On"), a tapper pays 1 On (= 100 grams) of sugar per tree per day, sometimes half an On per tree per day in kind or in cash to the owner.

"Sewa" (lease) of coconut trees is observed in other villages in Wangon subdistrict. A tapper leases a coconut tree (for 5,000 rupiah per year in 1994).

"Tebasan" (buying fruit or timber before the harvest) is common in Banyumas region. Durian, rambutan, duku and other fruit trees are sold before harvest by owners. In Banjarnegara, western part of Banyumas region, "Sengon Laut" (albizia, *Paraserianthes falcataria*) and "Cengkeh" (clove, *Eugenia aromatica*) have been sold in the way of Tebasan (de Jong & van Steenbergen 1987).

Motivation to set up communal forest

While various relationships concerning usufruct of private lands and crops are observed, communal resource management is uncommon in this area. Residents' illegal cultivation and active participation to Tumpangsari afforestation suggest that many residents need cultivable lands rather

than (communal) forests. If they owned more lands, they would prefer to mixed-plant tree crops on the lands, as shown in the present landscape of mixed gardens on the slopes.

The residents being engaged in coconut sugar making always need fuel, and prefer to use firewood. Many of residents in Karangkamal sometimes / usually buy firewood (Oikawa 1998). Thus, firewood is regarded as a commodity in the hamlet. Therefore, they will be pleased to plant firewood species if they have additional lands. However, if some want to sell more firewood³, they may clear again the state forests as they did before. Setting up or managing forests by the residents still leaves some room for consideration.

Conflict over land

Conflict over land under the present law has recently occurred in the form of illegal cultivation in the state lands. In May, some residents trying to overcome the Economic Crisis (called "Krismon" or "Krisis Monetor" in Indonesian) started to cultivate the grasslands and pine stands in the state land. Until the New Year's Day of 1999, at least 30 households have cultivated Palawija crops (see Table 2) by hoe. They cultivate even in the pine stands remaining on the steep slopes. Consequently, soil loss involving damages to the root system of the pine stands may be accelerated. No crackdown has been held yet by Perhutani.

3. Present state of the utilization of forest products

Difference of forest utilization among income or social classes

According to a staff of the Wangon subdistrict, the residents who have illegally cultivated the forest lands since May 1998 are landless or poor class of the Windunegara main hamlet. Some among them are also engaged in making coconut sugar, and sometimes illegally cut pine trees for firewood.

Table 2. List of forest products utilized by the residents*

Name of Products :	Use
<i>Tectona grandis</i> :	Timber, fuel, leaves for wrapping food
<i>Pinus merkusii</i> :	Timber, fuel (resin is processed by Perhutani)
Bushes / shrubs :	Fuel
Grasses:	Forage for goats and cattle.
Palawija (Maize, Cassava, Upland Rice, Groundnut) :	Food
Banana	

*Garden products in the private lands are much more than forest products as described in "Land categories recognized by the residents".

Difference of forest utilization among land/forest categories

The state forests near the Windunegara main hamlet were pine plantations for tapping pine resin before being illegally cut. At present, the upper part is still pine forests, but the lower part is grasslands. In Karangkamal hamlet, all hillsides are covered with grasses and some bushes. It seems that the grasslands have been created as the result of illegal cutting of pine trees, as described bellow. Lower parts of the hillsides are utilized as the residents' mixed gardens including timber and firewood species. These gardens have been established and developed by the residents. Pieces of homegardens and dry-fields (Pekarangan and Kebun) are sometimes planted with Sengon (*Paraserianthes falcataria*) and other timber species even though these are not so many as coconut trees are.

On the other side (=west side of the ridge) of Hill Tugel, residents from neighboring villages have participated legal cultivation for Tumpangsari afforestation from 1998.

4. Changes in forest utilization

³ Dick (1980: p.41) has pointed out that in lowland villages adjacent to hills additional fuel is more likely to be sold than to be supplemented for fuel production from house compounds (=homegardens).

Changes in forest utilization have closely related to villagers' livelihoods, especially to coconut sugar making which requires amounts of firewood.

In 1970's, local transportation to the cities was improved under development schemes of the New Order. Then, coconut sugar production increased in the Wangon subdistrict and around it. In Karangkamal, most of residents were engaged in coconut sugar making, and cut trees in the state forest.

According to the hamlet head of Karangkamal, the state forest behind the hamlet was formerly covered by secondary forests, and then Sonokeling (*Dalbergia latifolia*) and pine plantations were established by Perhutani. According to a report written by Hardjosoediro (1980), however, the slopes of Hill Putri had been already deforested in 1970. Then, in the 1970's, the residents who had increasingly needed firewood for cooking coconut sugar continued illegal cutting in the state forest. In 1987, they finally cleared all the slopes of Hill Putri.

In the 1990's, the residents have been able to obtain scraps of Sengon wood from the wooden dish factory in the neighboring village. In recent years, the residents in Karangkamal can procure firewood from the factory, homegardens and mixed gardens on the slopes. In 1997/98, Tumpangsari afforestation was started in the barren hillsides, as described above.

The process of deforestation on the western slopes of the Windunegara main hamlet is likely similar to that of Karangkamal. Since May 1998, however, some residents in the main hamlet have cultivated palawija crops in the state forests.

5. Evaluation of forest utilization from the viewpoint of sustainability

The residents have utilized the state forests bounded on their village as their convenient resource. The state forest is regarded as a "buffer zone" where they can collect firewood and temporarily cultivate annual crops. Although they are regarded as "illegal" cultivators and loggers, no hazards (such as landslides) have happened yet.

From the viewpoint of industrial forest management, however, the state forests in Windunegara have not been sustainably managed to provide timber or resin.

While the state forests in this village have cleared by the residents, their homegardens have been sustainably managed for coconut sugar making. In order to fulfil the different needs for the residents, tree-crop-based mixed gardens have been developed by many residents. Because they have introduced firewood species such as *Gliricidia* and *Calliandra* in the mixed gardens, these are regarded as an alternative for decreasing firewood resources. Some residents have used their homegardens and mixed gardens as vegetable gardens, and some others have used them as tree gardens or fruit orchards. Thus, the functions of mixed gardens are changed into more intensive- or extensive ones as a result of owners' situations. Therefore, homegardens and mixed gardens may be regarded as "another buffer zone" for the residents.

At present, unfortunately, there are no more lands to be planted by the residents. In order to solve the insufficiency of lands, it may be better that usufruct of the state lands is given to the residents by a long-term contract with Perhutani.

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APPENDIX

An Preliminary Observation in Cilacap regency

Illegal logging is not uncommon in Java (Peluso 1992). Although the researcher could not collect sufficient information on illegal logging in the field study, a case of the illegal teak logging by the local people in Citepus village, Jeruk Legi subdistrict, Cilacap regency, is referred to as additional information. The visit to the state forest in Citepus village could be realized by the permissions from

Perhutani Unit I in Semarang, and its branches in Purwokerto, Cilacap and Jeruk Legi.

Setting

Jeruk Legi subdistrict is located on the Cilacap regency side of the border between Banyumas and Cilacap regencies. It is bounded by Wangon subdistrict to the north. The state teak forests and rubber plantations are distributed in the hills (100-300m) in this subdistrict. The forests are managed by Bokol Forest Management Subdistrict (BKPH Bokol). BKPH Bokol consists of 4 Forest Management Blocks (RPH). The state forest in Citepus village is included in Citepus Forest Management Block, which is mostly covered with teak stands. Clay soil (Tanah Liat) forms under hilly teak forest in Citepus village.

Recent main activities in the Citepus Management Block are:

In 1989/90 Harvest and thinning

In 1990/91 Planting by Tumpangsari on the sites harvested in 1989/90

In 1996/97 Thinning

In 1998/99 Harvest in the interior stand.

In 1998/99, Mentasan Forest Management Block, southwestern side of Citepus, has some stands harvested.

When thinning is done 10 years after planting, timbers less than 4 centimeters of diameter are abandoned. These abandoned timbers are used as firewood by local people. Harvest of mature stands also provides amounts of branches and fragments in the course of sawing. Thus, villagers can easily procure firewood when Perhutani cut or thin forests near villages.

Citepus village is bounded on west and north sides by the state teak forest where villagers collect firewood. The state forest looks well-managed. Landscape of the village is formed of paddy, homegardens, and mixed gardens between the state forest and homegardens (settlements). Landscape of the village and teak forest behind it apparently harmonious. About 70 % of total households make coconut sugar (information from a coconut-sugar collector in Citepus). Unlike the landscape in Windunegara village, no barren lands are seen from the village.

Firewood Collection in the Village

The state forest in Citepus has provided firewood to local people in Citepus and other villages not bounded on the state forests. In the forests, local people collect and chop firewood (dead trees and fallen branches), then carry it on the shoulder with carrying pole ("Pikulan") to the road. The weight of firewood which they carry with the pole is 30 to 40 kilograms or more. Then, bundles of firewood are carried to the market or collectors' villages by pickup or wagon / mini-bus ("Angkutan Pedesaan").

With price rise triggered by Monetary Crisis in 1998, kerosene price also have jumped double or more. Therefore, firewood has become an alternative of kerosene for them. Since before, firewood has been not only for self-consumption but also for income source for local people. In recent days, however, poor villagers who cannot purchase sufficient kerosene, have used firewood (a case in Madiun regency, East Java : Indonesian daily newspaper "Kompas" on May 9, 1998).

According to the coconut-sugar collector in Citepus, villagers prefer to use teak wood as firewood because it is burned well. Pine wood is also preferred. When thinning is done in the state forests, villagers can obtain small teak timbers (for firewood).

In the village, shrubs, Kemlandingan (*Leucaena leucocephala*) and Serisida (*Gliricidia sepium*,) are planted as fence and provide firewood and fodder. These shrubs are also planted in Tumpangsari plots as "Tanaman Sisipan"(inserted crops). Villagers can collect the shrubs remained in the forest floors.

While the state forest has been used for firewood, problems on illegal logging has arisen between Perhutani and villagers. On February 2, 1996, since a forester gunned one of three villagers who were suspected to be cutting teak illegally in the state forest. About 400 villagers of Citepus village rushed to the Perhutani's subdistrict office (Kantor Polsus) in the Wangon town, and broke the building in anger ("Kompas", February 3, 1996).

Illegal Cutting or Firewood Collecting?

Taken by a young forest policeman ("Mandor": originally means foreman, and doubles as forest police) of BKPH Bokol, the researcher tried to interview to villagers collecting firewood in the forest.

But it was not realized because the forester had a fear to get into a trouble with the villagers. The researcher heard someone chopped wood with ax in the forest although it was not clear that they were cutting living trees or dead trees.

According to the head of the village cooperation in Wangon subdistrict, some rich villagers in Citepus have organized a illegal logging group to steal teak in the state forest by chainsaws and trucks. He also says that stolen teaks are sold by brokers in the cities (and transported again or exported), and this logging has been concerned with the village head (who was discharged after the case).

Parts of teak forests in this village were planted by Tumpangsari method. It means that, a few decades ago, villagers cooperated to establish these forests. At present, however, the forests are used by them, not only for the place to firewood collection but also for illegal cutting. Though Perhutani has achieved a measure of success through Tumpangsari afforestation, it cannot manage the forest yet through such participation of villagers.