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Mechanisms behind teak forest destruction and the measures taken by Perum Perhutani

1. Introduction

The State Forestry Corporation (Perum Perhutani, hereafter Perhutani) was issued the right to manage forest in Java Island and Madura Island (hereafter Java), excluding conservation forests. Perhutani applied the organization and techniques of the forest management of Dutch Forest Service emphasizing on teak (*teakota grandis*) plantations. To establish a teak plantation, *tumpangsari* reforestation system has been used since Dutch colonial era (Kartasbrata, 1992). In *tumpangsari* system, Perhutani gives cultivator usufructuary right to intercrop in *tumpangsari* allotment for several years and grant cultivators right to obtain harvest from the allotment. In return, cultivators had to take care of seedlings. Due to *tumpangsari* system, Perhutani obtained cheap labor and cultivators obtain farmland without payment. According to Masuda (1986), there were two types of cultivators engaged *tumpangsari* in Central Java: one was professional forestry labor; another was farmer living in the surrounding village. This system was mutually beneficial, thus Perhutani’s forest management was comparatively stable.

After 1998, however, many offensive activities, such as illegal logging, forest fire and illegal cultivation, increased drastically in the state forests of Java (Figures 11.1 & 11.2). According to the data by Perhutani, damages to forest increased dramatically (Perum Perhutani, 1996 & 2001, PT. Perhutani, 2003). As a result, the area of degraded land increased. From the fact above, we suspect that there is possibility that people engaged in the *tumpangsari* system has changed. The objective of this study is to clarify socio-economic characteristics of the cultivators in the state forest as well as the countermeasures taken by Perhutani after 1998.
2. Methods

This study was carried out in July-September, 2003 and September, 2004. G village located in Japah sub district, Blora district, Central Java province was selected as a study site. At the first year, the focus was on livelihood option of farmers who do not have permanent income source. The population excluding permanent employees was 336 households and 70 households (21%) were randomly sampled. The type of interview conducted was based on questionnaire about family structure, land possession, income, forest use, and etc. The second year focused on in depth interview based on questionnaire limiting the sample households to 42 households engaged in cultivation of state forests. Another village was also selected from the same sub district for a reference, and interviews to key informants were conducted. Unlike G village, which forms an enclave surrounded by teak forests, the locality of this S village is in between forests and plains.

3. Farmers in the teak forests

3.1. Outline of G village

G village is one of the enclaves commonly found in Kendung Utara and Kendung Selatan Mountains, which have formed into the center of teak plantation. The People in this village depend on forest resources from the teak plantation, such as branch for fuel wood, leaves for wrapping food at ceremonies, medicinal plants, and other non-wood forest products (Figures. 11.3, 4, 5, 6, 7, 8 & 9).

This village consisted of 1 sub-village (Dusun), 7 neighborhood associations (RT: Rukun Tetangga). The Population was 1,130, and the number of households was 348 with its population density of 197/km². According to author’s field survey, the employment status (number of households of each status) was: employee of Perhutani (5), teacher (4), pensioner (2), midwife (1), and farmers who did not have permanent income source (336). About 97% of households were engaged in agricultural activities. Average agricultural land area was 0.47ha per household, of which 0.26ha was wet paddy field and 0.21ha was dry paddy field in 2002 (G village, 2003). All the wet paddy fields in this village were rain-fed. Wet-paddy was planted in the rainy season; in dry season, corn and leguminous were planted. In the dry paddy field, farmer plants dry-paddy in rainy season; and corn, leguminous and cassava in the dry season. If there is sufficient precipitation, farmers can double crop.
Figure 11.3. Illegally logged over area in G village (August 2003).

Figure 11.4. Pile of Illegally logged wood inside G village (September 2004).

Figure 11.5. & 11.6. Teak leaves used at a ritual of circumstance in G village (September 2004)

Figure 11.7. One of the medicinal plants collected from the teak forests by villagers (September 2003)
3.2. Changes in teak forest management

State forest in G village is included in KPH (Kesatuan Pemangkuan Hutan) Mantingan’s district. Forest in KPH Mantingan consists of Teak plantation forest. KPH Mantingan was one of the most damaged KPH by illegal logging. Therefore, around G village, tree illegally logged and person carrying illegally logged tree could be observed (Figures 11.10, 11, 12 & 13).
3.3. **Land use and management in G village**

It was identified that there were several types of land uses for agriculture in G village. They include, (1) owned land, (2) land based on contract and (3) area of state forest used for cultivation. In this village, there were three kinds of land contract: lease, share tenant (*mertigo*), and pawn (*gadai*). The area of state forest used for cultivation consists of *tumpangsari* allotment and illegal cultivation (Figure 11.14).

### Agricultural lands are:

- Paddy field: to plant paddy, corn, beans and cassava.
- Upland: to plant paddy, corn, beans and cassava.
- Land rented in or out: In this land, there were two kinds of contract.
- Share tenant (*mertigo*): Seed, seedling and fertilizer are given by landowner. Cropper absorbs labor force. 1/3 of harvest is parceled to landowner, and 2/3 parceled to cropper. In the G village, this type of cultivation was rare and there were no sample households taking this type of cultivation.
• Pawn (gadai) land owner borrows money. Person who loan money can use the land until landowner will pay back the money. All harvest belongs to Person who loan money.
• Cultivated land in the national forest:
• Tumpangsari allotment: cultivator contract to cultivate the forestland with Perhutani. Cultivator can use the forestland for 2 years. Cultivator has to accede to the way of cultivation decided by Perhutani.
• Illegal cultivated land: the forestland used by cultivator without permission from Perhutani.

In this study, managed land was defined as:
\[ LM = LO - LRO + LRI + FC \]
LM: land managed
LO: land owned
LRO: land rented out
LRI: land rented in
FC: forestland under cultivation

According to land management, sample households were divided into three groups:
A: Only owned land.
AX: Owned land and cultivated land in the state forest.
X: Does not own land but has lease agreement with landowners or has cultivation in state forests.

Note: There were small holders that does not to own or not engaged cultivation of state forests, but we exclude them from the analysis.

3.4. Characteristics of the encroachers

Number of households and average area of land managed are shown in table 1. It is worth noting that, people of the AX group managed not only the largest area of farmland but also tumpangsari allotment and illegally encroached land inside forests, which resulted in twice as large area as of A and X group in total.

Table 11.1. Number of households and average area of managed land

<table>
<thead>
<tr>
<th>Types of land management</th>
<th>Number of households (%)</th>
<th>Average area per household (m²)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Paddy field</td>
<td>Upland</td>
<td>Paddy field (gadai)</td>
</tr>
<tr>
<td>A</td>
<td>26 (38.2)</td>
<td>2498</td>
<td>192</td>
</tr>
<tr>
<td>AX</td>
<td>22 (32.4)</td>
<td>2533</td>
<td>254</td>
</tr>
<tr>
<td>X</td>
<td>20 (29.4)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>All type</td>
<td>68 (100.0)</td>
<td>1775</td>
<td>945</td>
</tr>
</tbody>
</table>


Table 11.2. Reason for cultivation in the state forest*

<table>
<thead>
<tr>
<th>Reason of cultivation in the state forest</th>
<th>AX</th>
<th>X</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fertility</td>
<td>13</td>
<td>10</td>
</tr>
<tr>
<td>Increase in one's earnings</td>
<td>8</td>
<td>3</td>
</tr>
<tr>
<td>Conveniently located</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>Follower of friend (ikut-ikutan)</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>No owned land or upland</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Constrained by Perhutani</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

*multiple choice system

Reasons for cultivating forestland are shown in table 11.2. The noteworthy finding is that the reason for cultivation in the state forests was merely to follow what their friends were doing.

Characteristic of all the type of households are shown in table 11.3. From the average area of managed land and average price of owned livestock, it was estimated that type X was poorer than type A and type AX.

**Table 11.3.** Characteristic of households

<table>
<thead>
<tr>
<th>Type</th>
<th>Average age of head of a household</th>
<th>Family structure</th>
<th>Average number of family</th>
<th>Labor force</th>
<th>Average of price of total owned livestock (Rp.1,000)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>41</td>
<td>3.6</td>
<td>60</td>
<td>62</td>
<td>6,653</td>
</tr>
<tr>
<td>AX</td>
<td>46</td>
<td>4.3</td>
<td>60</td>
<td>75</td>
<td>5,946</td>
</tr>
<tr>
<td>X</td>
<td>46</td>
<td>3.5</td>
<td>63</td>
<td>62</td>
<td>3,319</td>
</tr>
</tbody>
</table>


In type AX, more than 90% of households’ income from cultivated state forest account for less than 50% of total agricultural income and approximately half of households did not get income from C (Figure 11.15). In contrast, for almost all the households within type X, income from cultivated land in forest land account for 100%. To focus on conditions of harvest, 44.7% of households in type AX answered that they had poor harvests in CLF and only 25% of households of type X answered they had poor harvests in C (Figure 11.16). Therefore, type AX’s management of C was poor compared to type X’s management.

**Figure 11.15.** Percentages of income from FC of type AX

Source: Author’s field survey (2003)
Characteristic of economic activity could be estimated from non-agricultural income. Non-agricultural income can be obtained from sub-work, such as day laborer, middleman, peddler, etc. or sale of non timber forest products (NTFP). About 64% of the households of type AX had non-agricultural income from sub-works and about 40% of the households of type X had non-agricultural income from sub-works (Figure 11.17). About 55% of the households of type AX sold NTFP and about 25% of households of type X sold NTFP (Figure 11.18). Therefore, type AX’s economic activity was diverse and they got large income from non-agricultural works compared to the households of type X.
Table 11.4. Comparison of the changes in the types between 2003 and 2004

<table>
<thead>
<tr>
<th>Types of land management</th>
<th>Number of households</th>
<th>2003</th>
<th>Types of land management</th>
<th>Number of households (type of 2003- type of 2004)</th>
<th>2004</th>
</tr>
</thead>
<tbody>
<tr>
<td>AX</td>
<td>22</td>
<td>AX’</td>
<td>5</td>
<td>(AX-A:5)</td>
<td>A’</td>
</tr>
<tr>
<td>X</td>
<td>20</td>
<td>AX’</td>
<td>19</td>
<td>(AX-AX: 16, X-AX: 3)</td>
<td>19</td>
</tr>
<tr>
<td>Total</td>
<td>42</td>
<td>X’</td>
<td>18</td>
<td>(AX-X: 1, X-X: 17)</td>
<td>18</td>
</tr>
</tbody>
</table>

Source: Author’s field survey (2003, 2004)

Table 11.4 shows comparison of the changes in the types between 2003 and 2004. From 2003 to 2004, 5 households from type types AX stopped their activities in C. The reasons of stopping their activities were (number of households); termination of a contract with Perhutani (2), abandonment (too old to cultivate or because friend quit) (2), pass on to other person (too old to cultivate) (1). In type X, there was one household who quit cultivating in forestland because of boredom of cultivation (Figure 11.19).

As a result of above mentioned analysis, type AX can be defined as dispensable type who views cultivation in the forestland as side business. They either view the management of C as direct source income or one
aspect of income diversification. Thus, if they do not gain maximum benefit from the land, they abandon the C. X can be defined as indispensable type who envisions cultivation in the forestland as critical aspects of their livelihood strategy. They fully depend on the income that derives from the forestland. Therefore, forestland is inevitably indispensable.

Although all the types of households in the study site were able to access degraded land in the state forests and illegal cultivation, we should take appropriate management scheme for controlling different types of household. Improvement of *tumpangsari* can be one of the solutions that can be looked into by Perhutani. For types AX, it is necessary to control the engagement to *tumpangsari*, because they lack incentives for managing C and moreover C often fails to become an alternative income source for their livelihood. In contrast, for type X, it is necessary to shift their livelihood strategy from encroachment to the *tumpangsari* system. Hence, targeting potential types of farmers that can engage in *tumpangsari* system is crucial.

4. Participatory forest management in teak forests

4.1. Participatory approaches to teak forest management

Action plan by Perhutani to struggle against deforestation in Java was started with Director Decree No.1061/kpts/Dir/2001 on Joint Forest Management (Pengelolaan Hutan Bersama Masyarakat, hereafter PHBM), but could not be successful at the beginning. Then the Governor of Central Java issued the Decree No.24/2001 on community forest resources management and the District Head (Bupati) of Blora also issued a decree No.522/1992/2001 on the communication forum of PHBM at the district level. Perhutani also issued another decree No.001/kpts/Dir/2002 on product sharing between local people and Perhutani. Decree No.2124/kpts/1/2002 is a guidelines for lower level staff on forest management with community. This product sharing system is called Joint Forest Resources Management (Pengelolaan Sumberdaya Hutan Bersama Masyarakat) and also abbreviated as PHBM. Decentralization under the jurisdiction of Perhutani got moving with this new scheme, in which local governments are given an authority to controlled forest resources.

According to the guideline, the first step is to form a village institution. To promote PHBM, Perhutani started to organize a model village in every sub-district, in which process Participatory Rural Appraisal (PRA) by new graduates from economics, sociology and forestry is incorporated.

4.2. Implementation of PHBM in teak forests

According to a case of Nglawungan sub-district of Unit I, Perhutani, Lembaga Masyarakat Desa Hutan (LMDH) Wana Lestari was formed in July, 2002 with under the consent of notary public.
LMDH is an institution to conduct PMDH, which consists of village apparatus and village members who have stakes to forest resources and are willing to participate in the program of PHBM (Fig 11.20). There are a conservator and an advisor superior to the chair of LMDH (Anonym., 2002). The conservator is served by the head of the village concerned. The program of LMDH complies with the activities provided by Perhutani, such as plantation, forest maintenance and guarding until production takes place. Perhutani facilitates and funds for the necessities until an LMDH is organized and starts their activities (Figure 20.21).

The example to share the produce from thinning under PHBM is shown below:

\[ P = M \times % (<25) \times \text{Total Production} \times \frac{1}{I} \]

- \( P \): share of LMDH from thinning
- \( M \): period of joint management of the forest concerned
- \( I \): interval between the thinning concerned and the previous thinning
- \( % \): maximum percentage of the share of LMDH
In the case of Wana Lestari LMDH, they obtained the maximum of 25%. If there are any damages caused by illegal activities such as logging, it reduces the share of LMDH.

4.3. The Effects of PHBM Program

According to the internal document Perhutani, damages caused by illegal logging in the areas under PHBM program, which consist of 52 villages, could be reduced after the implementation of PHBM (Table 11.5). Though it just compares the change of short period and PHBM program has just started in the villages cooperative to the activities of Perhutani, effectiveness of PHBM can be supposed from it can be conjectured. Whether it can be expanded to every village adjacent to valuable teak forests is seemed to one of the key issues for teak forest conservation and rehabilitation.

Table 11.5. Change of damages caused by Illegal logging in PHBM areas

<table>
<thead>
<tr>
<th>Period</th>
<th>Illegal logging</th>
</tr>
</thead>
<tbody>
<tr>
<td>January – June 2002</td>
<td>5,518 m3</td>
</tr>
<tr>
<td>January – June 2003</td>
<td>2,089 m3</td>
</tr>
</tbody>
</table>


Acknowledgement

We wish to express our gratitude thanks to Unit I Central Java, KPH Blora, KPH Mantingan, BKPH Kalinanas, and residents in G and S villages.

Reference