International Journal of Social Forestry (IJSF), 2011, 4 (2):113-138.
ISSN 1979-2611, www.ijsf.org

OVERCOMING VULNERABILITY OF PRIVATELY OWNED SMALL-SCALE FOREST THROUGH COLLECTIVE MANAGEMENT UNIT ESTABLISHMENT: A CASE STUDY OF GUNUNG KIDUL DISTRICT, YOGYAKARTA IN INDONESIA

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Abstract

The timber shortage caused by imbalance between supply and demand is a serious problem in Indonesia. In this context, Privately Owned Forests (POFs) have been spotlighted to meet the demand. The characteristics of POF basically managed by individual farmers, however, have high vulnerability to secure stable wood supply. In order to overcome the vulnerability, a Privately Owned Forest Management Unit (POFMU), which shifts the POF managements from individual management to collective management, was initiated in Gunung Kidul (GK) district, Yogyakarta in 2004. Subsequently, the local people's cooperative association was established in 2006; and the POFs have been managed using Indonesian forest certification. The objectives of this study are to examine 1) the organization structure of POF management and 2) obstructive factors which impede further implementation of POFMU. Literature research, field observation as well as interviews of key informants and general members of the cooperative association were conducted. Three types of local associations for multi-layered POF management and forest certification were found to contribute to an integrating small-scale POF for joint forest management. On the other hand, harvesting immature trees for personal economic factors, forest shrinkage and land absentee problem due to social factors were found to impede further POFMU implementation. In order to meet the wood demand from wood industries and market, local farmers have to navigate both factors over long periods. While POFMU and

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cooperative associations as self-help efforts help local people, economic and social support by third parties is also important to sustain local people's motivation.

Keywords*: farm forestry, individual management, collective management, cooperative association, forest certification*

Introduction

Multiple functions of forests play important roles not only in wood production, but also in aspects of climate change mitigation and biodiversity conservation. In order to maintain these functions optimally, it is important to use timbers derived from environmentally sound forests. An imbalance between wood supply and demand has been a serious problem in the forestry sector of Indonesia, and the shortage of timber as raw material due to the imbalance has been one factor behind the illegal logging that leads to serious deforestation and forest degradation (Guritno 2000, Wardojo 2003, Noordwijk *et al.* 2007, Obidzinski & Chaudhury 2009, Obdzinski & Dermawan 2010, Rohadi *et al.* 2010). To date, the timber shortage has continued and industries and log traders have found it more difficult to obtain larger diameter logs (Purnomo, Melati & Irawati 2009). In order to bridge the gap between wood demand and supply, many approaches, including company-community partnerships and Community Forest Plantations (*Hutan Tanaman Rakyat*), have been undertaken in the state forests (SFs) of Indonesia (Nawir, Santoso & Mudhofar 2003, Nawir & Santoso 2005, Noorwijk *et al.* 2007, Obidzinski & Chaudhury 2009, Obdzinski & Dermawan 2010). Also, some companies have begun contractual tree farming with farmers in privately owned forests (POF) to ensure raw materials for the future (Nemoto 2003, Iwanaga *et al.* 2010).

There are about 94 million hectares of forest in Indonesia, and POFs contribute only 9% of the total area (FAO 2010). By contrast, decentralization and devolution of forest management has been progressing in Indonesia. Since the fall of the Suharto regime, there has been political and economic reformation (*Reformasi*). Agrarian reform, which attempts to redistribute land fairly, has also been revitalized after 32 years suspension during the Suharto regime. Thus, current trends indicate that the area of forest owned and managed by local people and communities will increase in Indonesia. In addition, along with the reduction of timber productivity in SFs, POFs have been increasingly important contributors to wood supply (Pramono *et al.* 2010), and the amount of timber harvested by communities has increased dramatically during last decade (Hinrichs, Muhtaman & Irianto 2008). The Indonesian government has also paid attention and taken into account the existence of POFs in forestry development (Supriadi 2002). Industry observers have also predicted that community and smallholders will produce more teak

and mahogany timber than state forest company (*Perum Perhutani*) in the future (Purnomo, Melati & Irawati 2009).

A POF is called *Hutan Hak* or *Hutan Rakyat* in Indonesia. According to the Indonesian Law No.41 in 1999, the *Hutan Rakyat* is defined as a forest that allocates land ownership rights. On the other hand, the Ministry of Forestry (MoF) defines it as forest owned by people with a minimum area of 0.25 ha, with more than 50% in crown closures of wood plants and/or other plants, and/or a minimum of 500 trees per hectare at the year's first planting (Forestry Minister Decision No.49 in 1997). In addition, Awang, Wiyono & Sadiyo (2007) mention that *Hutan Rakyat* is a forest resource consisting of home garden (*Pekarangan*), dry land (*Tegalan*), and forest (*Alas* or *Wono*) fully owned by a community[1].

Even though the term of *Hutan Rakyat* is relatively new, POF existed as *Pekarangan* in Java (Simon 2008), having been developed by the Netherland colonial government in the 1930s. After independence, the Indonesian government undertook an afforestation program (*Karang Kitri*) in the 1950s. Voluntary actions were also taken by farmers in areas such as Gunung Kidul (GK), Wonogiri, Kediri, Purworejo, Boyolali, Sukabumi, and Garut districts. Nationwide efforts continued under the umbrella of a greening program from the 1960s to early 2000. Meanwhile, a model for partnership between entrepreneurs and farmers' organizations facilitated by the business loan fund for POFs was also launched in 1996. The National Movement for Forest and Land Rehabilitation (*Gerakan Nasional Rehabilitasi Hutan dan Lahan*), which encouraged the planting of trees on both state and private land, was implemented after 2003 (Awang 2005a; Awang, Wiyono & Sadiyo 2007; Simon 2008).

POF management systems in Indonesia have these common characteristics: 1) POFs are located on private land with poor soil conditions and severe topographies; 2) POFs are set out separately by each family, based on location, land ownership, and diversity of agroforestry patterns; 3) There are not yet professional organizations for POF managements, and POF management is conducted without integration at the individual level. 4) POF management has limited labour power, and management is conducted by family members and/or communal farmers' organizations; 5) POFs play a role as farmers' saving and/or stock, which can provide cash flow in urgent

[1] Home garden (*Pekarangan*) is area surrounding farmer's homes, and trees are commonly planted along the boundaries of these areas in which vegetables and other crops are cultivated. Dry land (*Tegalan*) is area for agroforestry production of crops, timber trees, and wood crops for fuel, and land use in these areas is more intensive than in forest (*Alas* or *Wono*). Forest (*Alas* or *Wono*) is area designed for tree plantations where there is no planting of food crops; these are relatively far from farmer's homes, and their soil is typically rocky, infertile, hilly, and steep (Hinrichs et al. 2008).

situation and/or for special purposes. Therefore, the harvesting is conducted according to personal needs (*Tebang Butuh*), and trees are cut by farmers for their needs even if trees are still immature without considering the calculated plant increment. 6) There are no formal management and planning systems. Therefore, synchronization among stable wood supply for traders, industries, and conservation and continuity of forests is not secure. 7) POF management lacks high competitiveness, as farmers do not have high bargaining power with traders and industries (Awang 2005a; Awang 2005b; Ichwandi *et al.* 2005; Widayanti, Himmah & Awang 2005; PKHR 2006; Awang, Wiyono & Sadiyo 2007; Ichiwandi, Shinohara & Nakama 2007; Hinrichs, Muhtaman & Irianto 2008; Simon 2008).

Along with the significant increase in teak prices in Java during the late 1990s, teak factories have started to look for sources of teak outside the SFs managed by state forest company (Hinrichs, Muhtaman & Irianto 2008). In recent years, wood processing industries have directly come to villages to purchase wood produced in POFs. Consequently, even though the harvesting is traditionally conducted according to the personal needs of those who manage the POFs, local people have cut down trees not only for their personal needs, but also because of market pressures from the industries that need the raw materials. The recent changes in behaviour toward wood processing have caused a change in the management of POFs in Java, especially the GK district (KWML 2006a). In order to overcome vulnerability and achieve stable wood supply of POF, project on Privately Owned Forest Management Units (POFMU) was conducted in 2004; subsequently, a local people's cooperative association, Koperasi Wana Manunggal Lestari (KWML), was established to manage POF with forest certification in GK district in 2006.

The objectives of this study are to examine 1) the organizational structure of POF management and 2) obstructive factors which impede the further implementation of POFMU. The first section describes the process of POFMU establishment and forest certification acquisition; subsequently, study site, history of POF development, and research method are outlined. The second section clarifies the organizational structure of POF management and obstructive factors which impede the further implementation of POFMU based on the result of field research. The third section discusses effectiveness and challenges of POFMU and the forest certification for sustainable POF management and further POFMU implementation. And the final section concludes with policy implications for sustainable POF management and stable wood supply.

Efforts by Privately Owned Forest Management Unit Establishment and Forest Certification Acquisition for Overcoming Vulnerability

KWML was established in GK district's across Kedung Keris, Dengok, and Girisekar villages in 2006. KWML has managed the POFs with forest certification (*Pengelolaan Hutan Berbasis Masyarakat Lestari*-PHBML) through the Indonesian Ecolabel Institute (*Lembaga Ekolabel Indonesia*-LEI). In 2004, the Centre for Community Forestry Studies (*Pusat Kajian Hutan Rakyat*-PKHR), Faculty of Forestry, Gadjah Mada University, and two local NGOs (ARuPA and SHOREA), launched a project of Construction Design Sustainable POFMU (*Rancang Bangun Unit Manajemen Hutan Rakyat Lestari*-RB-UMHRL). The weakness of POFs' development stems from its planning and management conducted by individual POF owners, and that effective development requires simple guidelines which are easy to understand and accepted by all POF owners (Simon 2008). Meanwhile, the vulnerability of the POFs had been exacerbated by the increased demand of wood from wood processing industries and the declining timber productivity of SFs caused by illegal logging and crop production failure (Widayanti, Himmah & Awang 2005, PKHR 2006).

Besides, the POFs also form part of a watershed ecosystem (*Daerah Aliran Sungai*-DAS). In order to keep watershed function optimal, it is expected that management plans for SFs and POFs be considered and formulated as an integrated watershed area development plan. Accordingly, it is necessary to direct POF management systems away from individual family action toward collective action (Awang, Wiyono & Sadiyo 2007). Therefore, RB-UMHRL was an intervention effort to save the POFs from declining both quality and quantity. It was, as well, a form of research encouraging the establishment of community organizations around watershed area POFs to achieve a sustainable POFMU, which is formed from an aggregate of POFs conducting collective action (PKHR 2006, Awang, Wiyono & Sadiyo 2007).

In parallel with the RB-UMHRL, the GK District Governor Decision (District Governor Decision 95/KPTS/2005) was established in 2005 to form a sustainable POF working group (POKJA-HRL). This POKJA-HRL was composed of the Governor and Vice-Governor, district government circles, university representatives, local NGOs, and representatives of POF farmers, and undertook to 1) conduct an inventory and determine the forest potential for sustainable POFs; 2) establish a program for dissemination of agro-ecosystem certification; 3) facilitate productive economic activity based on a POF; 4) achieve sustainable POF management as a means of community economic empowerment and environmental conservation; and 5) formulate a business development plan for various POF products.

Through the RB-UMHRL and POKJA-HRL, forest certification was recognized as one of tools which engendered high trust in market and could

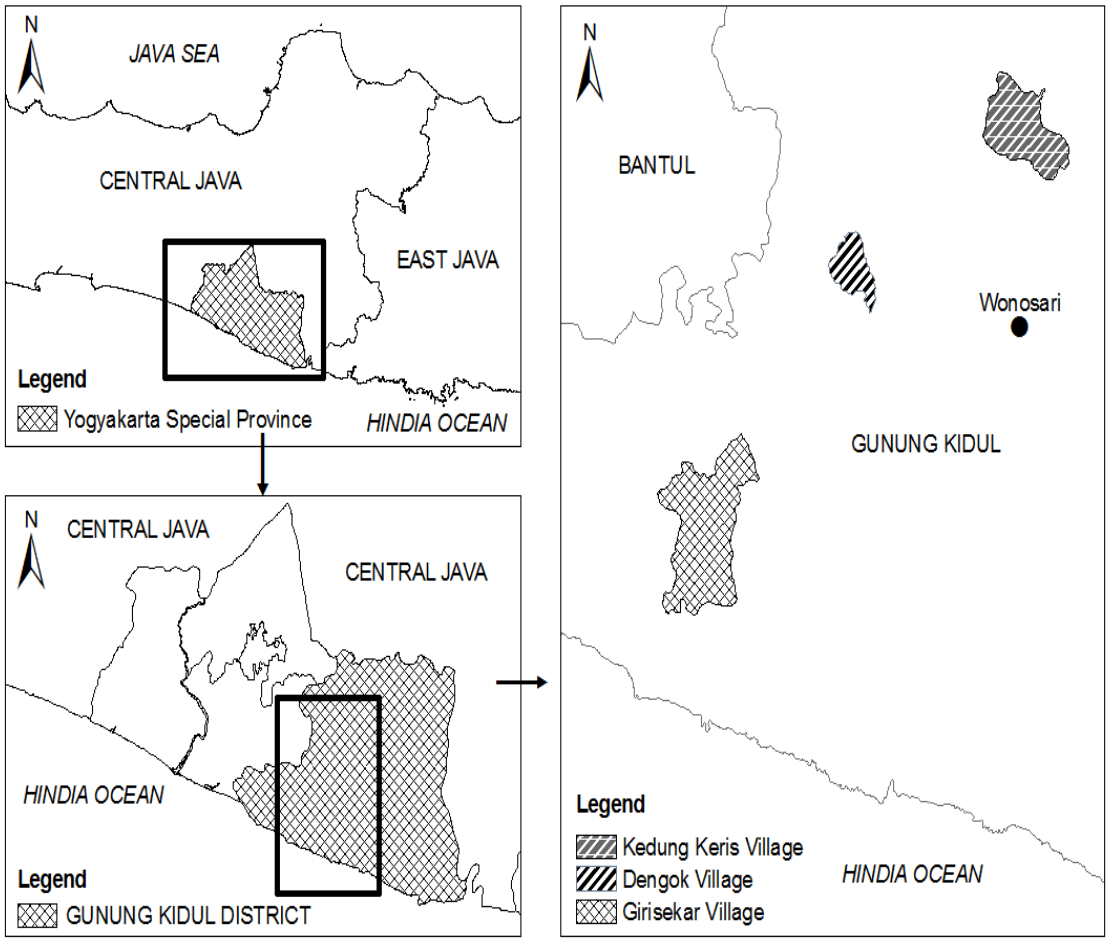
measure SFM according to predetermined standards and produce recommendations for management improvement. Such recognition led to a common perception that the POF management within GK district needed to be reformed and improved through the certification scheme. Of various forest certification programs, PHBML certification of LEI, the only program exclusively designed for community based forest management (Scheyvens, Harada & Hyakumura 2007, Maryudi 2009), was considered the most appropriate certification for POFMU in GK. At the same time, the working group selected Kedung Keris, Dengok, and Girisekar villages (all in different topographic areas), as locations for a pilot project (Sasono 2006), and targeted an additional 69 villages for certification (Hinrichs, Muhtaman & Irianto 2008). In order to acquire a certification title, an organization which had a corporate body was required, and the cooperative association was the only one which could accommodate many people and did not require large costs. Under these circumstances, KWML was established as the local people's cooperative association across Kedung Keris, Dengok, and Girisekar villages, and KWML has since been in charge of PHBML certification.

The Study Site and Research Methods

Study Site

The GK district is located in south of Yogyakarta special province, and the total area of the district is 1,485.36 km^2. There are 18 sub-districts, 144 villages, and 1431 sub-villages in the district. The GK district is known as a karst area where there are always shortages of water, especially in the dry season. The land condition is thin, marginal, and fragile. The GK district is formed by three different topographic areas: Batur upland area (*Zona Batur Agung*), Wonosari lowland area (*Zona Ledok Wonosari*), and Sewu mountainous area (*Zona Pegunungan Sewu*), which is known as the Southern limestone area (*Zona Kapur Selatan*), in order of location from north. While river water is available on the ground level in the Batur upland area and Wonosari lowland area, considerable river water is underground in the Sewu mountainous area (BPKH 2006; KWML 2006a). Kedung Keris village is located in the Batur upland area, Dengok village in the Wonosari lowland area, and Girisekar village in the Sewu mountainous area (Figure 1).

Figure 1. Location of Kedung Keris Village, Dengok Village, and Girisekar Village, Gunung Kidul District, Yogyakarta, Indonesia



Note: Provided by Mr. Yanuar Adrian Bomantara, Faculty of Forestry, Gadjah Mada University

The GK district is also well known for pursuing a successful afforestation and reforestation projects. Communities have rehabilitated barren land to improve uncultivable land conditions and evade water shortage during dry season (Hinrichs, Muhtaman & Irianto 2008, Nawir et al. 2007). Historically, the accesses of local people to SF areas have been very restricted, and local people have attempted to establish close relationships with administrators to obtain access for their daily needs such as wooden tools, firewood, and fodder in each period.

During the Japanese colonial period, large-scale deforestation and degradation occurred owing to massive exploitation by the Japanese colonial government, and this caused barren land to be widespread in the GK district. After independence, the top priority for forest management was

rehabilitations of barren land; meanwhile, access by local people to SFs could not be prevented and was rather increased for their livelihood needs. Consequently, deforestation and forest degradation became more serious in SFs. In order to deal with this problem and assure security of SFs, the Indonesian government regulated and prohibited access and use of SFs by local people and planted non-commercial trees such as cajuput (*Melaleuca leucadendron*) and white mulberry (*Morus sp.*), which were not planted or used by local people (PKHR 1999; KWML 2006b).

POF developments were initiated by the head of the Pringsurat sub-village around 1951, when local people could cultivate agricultural crops only once per year during rainy season on small amounts of privately owned land with poor soil conditions. Following the Pringsurat sub-village, POF development was also initiated in Kedung Keris sub-village in 1953. It is said that the sub-village heads had long-term vision, and they thought that residents needed economic strategies, especially for the sake of their children. They believed that planting trees with high economic value, such as teak (*Tectona grandis*), mahogany (*Swietenia microphylla*), and acacia (*Acacia auriculiforms*), which could be harvested in 10 to 20 years, would allow residents to utilize their income for their children, such as giving houses after marriage. In addition, local people expected that the wood plants would improve local water condition and POF development would lead to the creation of agricultural sector employment, which was very limited owing to low productivity caused by critical land conditions. These were also motivation for local people for planting trees on privately owned land (PKHR 1999; KWML 2006b).

To date forest areas have grown to 29,341 ha, which is the same with about 20% of the total area in GK district. Of which forest areas, about 55% forests are POFs dominated by teak. About 95,461 m^3 logs were produced in the POFs in 2009, of which, about 89% were teak logs (Table 1). The GK district plays an important role as teak wood supplier to teak furniture industries in Jepara, Java that consumes between 1.5 and 2.2 million m^3 of round wood per year (Roda et al. 2007; Rohadi et al. 2010).

The KWML manages 815.18 ha of certified forests; 184.25 ha in Kedung Keris village; 229.10 ha in Dengok village; and 401.83 ha in Girisekar village. The forest productivity potential for all types of timber is 135.5 m^3 per month in the three villages. There are 674 KWML members across these villages including nine sub-villages (Table 2).

Table 1. Trend in Volumes of Logs Produced in Privately Owned Forests

Year	Teak	Total	Ratio of teak
	(m^3)		(%)
2002	36,699	43,849	84
2003	51,168	61,327	83
2004	66,102	75,855	87
2005	83,252	96,636	86
2006	69,937	81,370	86
2007	59,403	70,614	84
2008	72,789	80,329	91
2009	85,404	95,461	89

Source: Statistics from the Forest Agency (*DINAS Kehutanan*), GK district

Table 2. Local People's Participation in KWML in the Three Villages

Village	Sub-village	Number of Households	Number of Participants	Participation Rate (%)
Kedung Keris	Kedung Keris	163	36	22
	Pringsurat	52	44	85
	Sendowo Kidul	153	56	36
Dengok	Dengok IV	88	23	26
	Dengok V	128	89	70
	Dengok VI	165	93	56
Girisekar	Blimbing	121	133*	100
	Jerukun	121	101	83
	Pijenan	164	99	60

Note: * included two participants from one household
Source: Statistics from the village office and KWML's documentation

Research Method

Field research was conducted between January and March 2010 in GK district. Key informant interviews were conducted on union head and board members of KWML, heads of POF Farmer Group and Association of POF Farmer Groups, and heads of sub-villages at Kedung Keris, Dengok, and Girisekar villages. The Kedung Keris village was chosen for individual interviews of KWML members because of its long history of POF creation and farmers' groups. A questionnaire was developed based on results of the informal interviews and it included question items about: 1) privately owned land; 2) planted trees and management method in POF; 3) household economy; 4) village livelihood; and 5) activities of farmers' groups and cooperative association. There were 136 KWML members in Kedung Keris

village; and a sampling of respondents was selected randomly, with 30 people per sub-village as a sampling guide. The total number of respondents from the three sub-villages was 85; 33 were from the Kedung Keris sub-village, 30 from the Pringsurat sub-village, and 22 from the Sendowo Kidul sub-village. Secondary data, such as statistics, documents, and materials related to POF management and activities of cooperative association were collected at offices of the district forest agency, Kedung Keris village, KWML, and local NGO at the time of those interviews. A literature research on POF and POF management and field observation at POF owned by respondents was conducted during the individual interviews.

Research Findings

Current Situation of POF Management in Kedung Keris Village

GK district inhabitants divide their land into three categories: home garden (*pekarangan*), dry land (*tegalan*), and forest (*alas* or *wono*). Table 3 indicates the owned land area and trees planted by the respondents in Kedung Keris village. One respondent owns 0.57 ha of land on average, and 89% of respondents own only under 1 ha of land. With regards to the planted trees, each respondent owns 802 trees on average in the POF dominated by teak. An agroforestry system called *Tumpang sari* is employed in POFs by the local people. Local people cultivate agricultural crops such as corn, peanuts, cassava between planting tree rows until crown closure. Tree tending methods are relatively similar for teak, mahogany, and acacia. The local people weed, thin and prune. Harvesting is performed by cutting selectively to meet personal needs. Planting methods are different, in that all seedlings are obtained from the POFs directly by local people. Teak seedlings are planted by the locals, mahogany and acacia mainly regenerate themselves naturally.

Table 4 indicates the source of labour for POF management. As shown by earlier studies, the family provides the main labour in Kedung Keris village. At the same time, hiring people and mutual-assistance are also utilized as an additional labour strategy for POFs management. Field analysis indicated that while the respondents who owned above-average areas of land had a tendency to utilize hired people more often (55%), the respondents who owned below-average areas of land had a tendency to utilize mutual assistance more often (39%) as additional labour power for POF management.

Table 3. Average Private Land Area and Planted Trees Owned by Respondents

Item	Kedung Keris	Pringsurat	Sedowo Kidul	Average*
Owned Land Area (ha)				
Pekarangan	0.13	0.18	0.12	0.14
Tegalan	0.19	0.31	0.2	0.23
Alas	0.13	0.25	0.21	0.2
Total	0.46	0.73	0.53	0.57
Number of Planted Trees				
Teak	322	827	712	620
Mahogany	36	139	38	71
Acacia	53	124	155	111
Total	411	1,090	905	802

Note: * Average of three sub-villages.
Source: Field Research (2010)

Table 4. Source of Labour Power for Privately Owned Forest Management

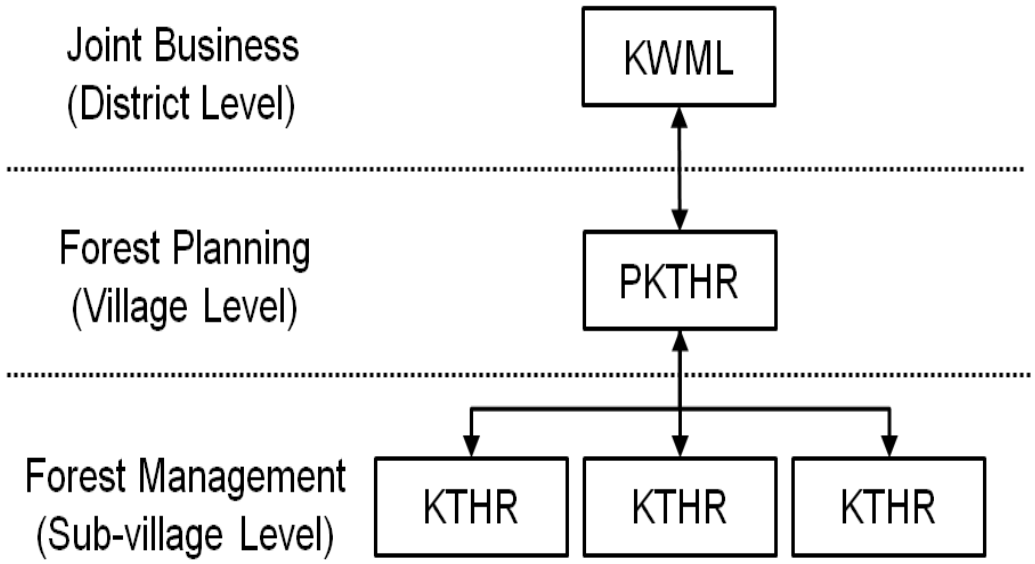
Land area	Family	Hire people	Mutual assistance	Farmer's group
< 0.57 ha (N=54)	46 (85%)	19 (35%)	21 (39%)	2 (4%)
> 0.57 ha (N=31)	30 (97%)	17 (55%)	5 (16%)	2 (6%)
Total (N=85)	76 (89%)	36 (42%)	26 (31%)	4 (5%)

Note: Multiple-answer, N= number of respondents, percentages indicate the ratio of respondents
Source: Field Research (2010)

Organizational Structure of POF Management

Presently, there are three types of local associations for multi-layered POF management: the cooperative association (KWML) for joint business at the district level; Association of POF farmer groups (*Paguyuban Kelompok Tani Hutan Rakyat*-PKTHR) for joint forest planning at the village level; and POF farmer group (*Kelompok Tani Hutan Rakyat*-KTHR) for POF management at the sub-village level (Figure 2).

Figure 2. Organization Structure of Privately Owned Forest Management



Source: Field Research (2010)

POF Farmer Group (KTHR) and Association of POF Farmer groups (PKTHR)

There are three KTHRs in Kedung Keris village, and many other farmer's groups such as agriculture, animal husbandry, religion, culture, and other purposes, at the individual and/or sub-village level.

Among the three sub-villages, the history of each KTHR is different. The KTHR, called *Sumber Rejeki,* was established in 1987 in the Puringsurat sub-village. This KTHR originates from the greening farmer's group which conducted land greening for livestock fodder. When the POF development was initiated in Pringsurat sub-village in 1950s, the planting activities at that time were conducted individually. Afterward, a farmer's greening group, called *Sumber Rejeki*, was established for collaborative activities. The current KTHR is based on this greening group. The objectives of *Sumber Rejeki* include a monthly meeting; a regular social gathering; and group management of agriculture, livestock, and nurseries by members. Subsequently, in 1992, the KTHR *Ngudi Makmur* was established in the Kedung Keris sub-village. This KTHR is based on a working group that wanted to advance in a POF contest. Lastly, the KTHR *Tani Makmur* was established in the Sendowo Kidul sub-village in 2006 (KWML 2006b). Even though not all residents have become KWML members, all have joined the KTHR in three sub-villages. A PKTHR, called *Margo Mulyo*, was established for joint forest planning in 2006, the year of the KWML establishment, to develop a joint forest management plan at village level coordinate activities of KTHRs for integrated POF management.

Members of the PKTHR include all members of each KTHR. Therefore, all residents in three sub-villages are PKTHR members as well.

There are various concrete rules and recommendations for sustainable POFs in the Kedung Keris village, and these are clearly stipulated as the guidelines for KTHR and PKTHR. For instance, members are required to 1) report to the broad community when they want to cut trees; 2) replant 10 times the amount of trees cut; 3) prevent clear cutting on their land and allow cutting only up to a maximum of 25% (selective cutting); and 4) impose penalties equal to 1 million Indonesia Rupiah when violation of the rules occur. These rules and recommendations cover a wide range of concerns, such as those related to logging and carrying out trees, planting distances, fertilization methods, and compensation when trees owned by other people have been destroyed. PKTHR established rules regarding tree cutting age, e.g. members are allowed to cut teak and mahogany older than 15 years and acacia and other trees older than 10 years. In order to keep the rules, PKTHR also suggests the use of alternative sources and provision of loans in an appropriate capacity to the PKTHR when members need money but trees have not yet reached the above-mentioned ages.

Cooperative Association (KWML)

KWML was established to manage POFs sustainably, based on forest certification. Its mission includes enhancing quality of life by conducting joint business with capital from the members. The capital is based on 5,000 Indonesia Rupiah as the initial contribution and 1,000 Indonesia Rupiah per month as the membership fee. The planned joint business ventures range widely in execution, including not only forestry but also agriculture, livestock business, trading, marketing, industry, distribution goods, and services. The businesses that have been implemented by KWML are: 1) buying and selling of certified timber; 2) buying and selling fertilizers; and 3) lending chainsaws.

After KWML's establishment, several changes in POF management have occurred in three villages. First, the growth increments for trees in three villages (135.5 m^3) were already identified through the forest certification acquisition process. The harvesting is conducted according to this forest productivity potential; therefore, this standard greatly contributes to prevention of over-cutting in the three villages. Secondly, the KWML members can borrow chainsaws from KWML through PKTHR, and they have used it in cutting trees. Previously, local people used axes and handsaws when they harvested trees. This chainsaw rental system is implemented based on the initial contributions and capital of the KWML members; it has made technical change in POF management possible in the three villages. The KWML establishment has made changes to the sales channels for logs. In general, the respondents sell teak logs to timber traders. However, some

members have begun to sell the logs to KWML, to whom they can sell at prices 10 to 15 % higher. Table 5 indicates the actual purchase price by KWML in December 2009. Some members who continue selling logs to the traders also want to sell to the KWML in the future. However, a large gap exists between the asking price of members and the actual purchase price of the KWML. Even though KWML has made efforts to expand trading partners, such as sending timber samples, KWML has not expanded its trading partners nor developed a market of certified timber sufficiently enough to meet the expectations of members.

Table 5. Price of Teak Logs Bought by KWML on December 2009

Log grade (Diameter)	Price (Indonesia Rupiah/m^3)
DL (10-13cm)	700,000
OP (15-19cm)	1,450,000
OD (20-28cm)	2,450,000
OGD (30-40cm)	3,600,000

Source: Field Research (2010)

The development of relations among Kedung Keris, Dengok, and Girisekar villages should also be pointed out. There were no relationships among the three villages before the KWML establishment. However, KWML has served as a trigger for intercommunication and/or joint activities among members. As one example of a new joint activity, woodcarving has been voluntarily launched to enhance the quality of certified timber by PKTHRs in the each village. Information about woodcarvings has spread throughout KWML among all three villages, and members have learned techniques of woodcarving. Even though the present woodcarving activities are mainly isolated activities by PKHRs at the village level, the joint selling of woodcarvings products has been planned as a new cooperative business venture of KWML. Meanwhile, despite distances, almost all respondents feel a good connectedness because they see each other as friends in an expanding social network. Therefore, KWML establishment contributes to the enhanced life quality of its members.

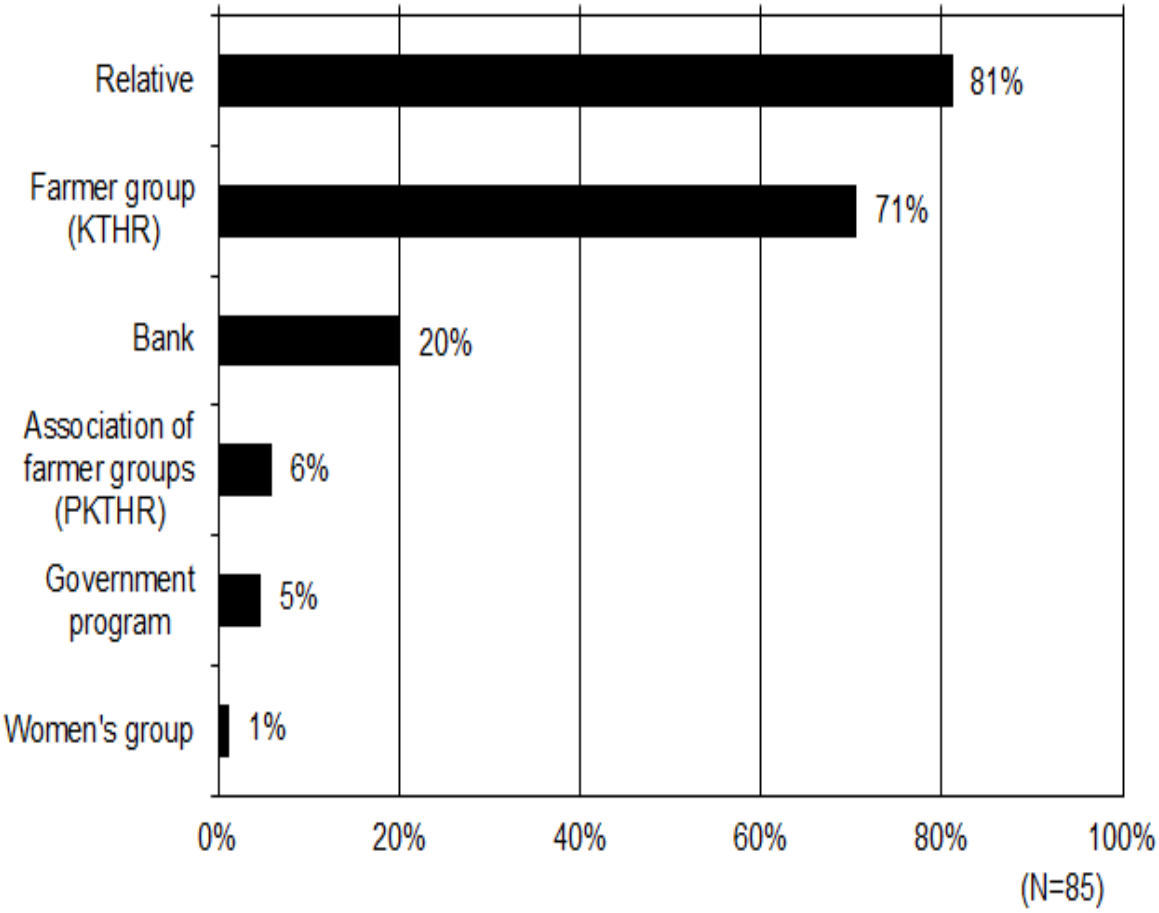
Obstructive Factors for Sustainable POF Management

Logging Immature Trees due to Economic Reasons

Figure 3 shows from where the respondents borrow money: 81% of all respondents borrow money from relatives; and relatives are followed by farmer's groups (71%). The reason why they borrow money is mainly to pay school fees for their children. Hospital visits and family affairs follow (Figure

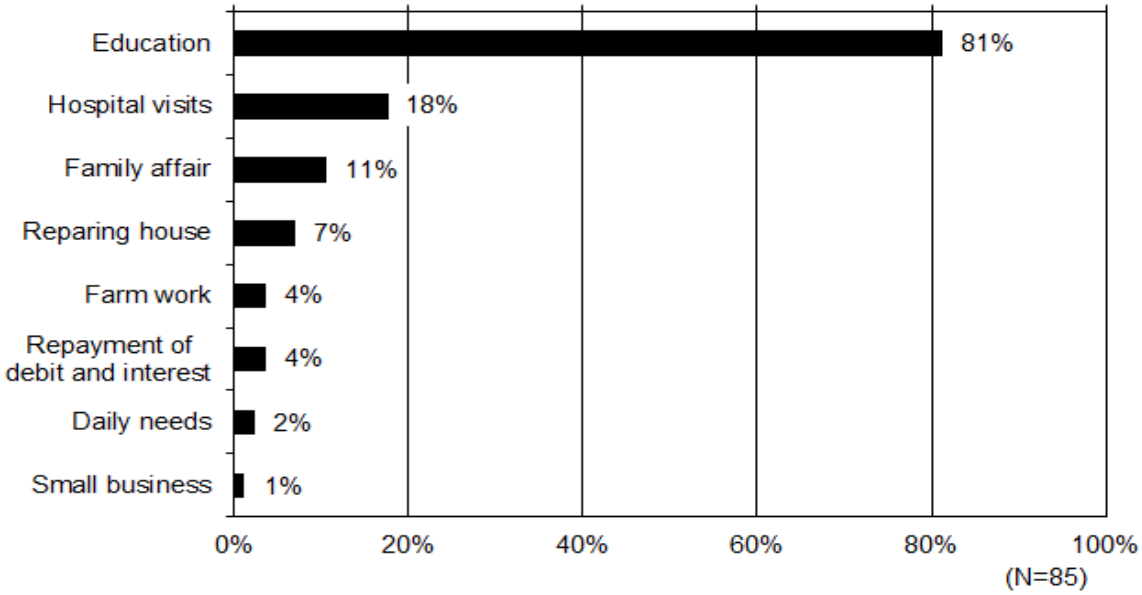
4). In general, members cannot borrow money again until they have repaid the previous debt, even if they need money urgently. Because of this restriction, local people cut young trees even though they are still immature to obtain money. About 80% of the respondents have cut young trees under 10 years of age to obtain money. KTHR and PKTHR have established rules regarding tree age for logging, but for economic reasons the rules have not been kept. Meanwhile, all respondents who have had this experience replied that they would not have cut the trees had they been able to obtain the money in an alternative way.

Figure 3. Places Where Respondents Borrow Money



Note: Multiple answers
Source: Field Research (2010)

Figure 4. Reasons Why Respondents Borrow Money



Note: Multiple answers
Source: Field Research (2010)

Forest Shrinkage and Population Outflow due to Social Reasons

Even though some local people have obtained the private land by purchase, in general, almost all the respondents obtained it by inheritance from their parents. Traditionally, land is divided equally among family members, and the children who live in other cities also have a right to receive land as their inheritance. A part of the inheritances is divided before parents' deaths, and all residual parts are inherited after death. Consequently, the land may shrink from its previous size under the inheritance system in Kedung Keris village.

Both numbers of population and households remained virtually constant from 2007 to 2009. There were 677 residents and 131 households in Kedung Keris sub-village, 275 residents and 56 households in Pringsurat sub-village, and 622 residents and 156 households in Sendowo Kidul sub-village respectively by December 2009 (Statistics of the Kedung Keris village office). In contrast, many respondents testified that young people from the three sub-villages have moved to cities to get jobs in recent years (Table 6). Of the respondents, 90% strongly believed that these young people would return to the village for POF management in the future. In terms of the labour power for POF management, nearly all the respondents think that there remains enough labour power in the sub-villages. However, in terms of future POF management, many respondents in the Pringsurat and Sendowo Kidul sub-villages were aware that potential labour power had begun to decrease (Table 7).

Table 6. Awareness of Young Village People's Movement to the City to Obtain Employment

Movement of young village people	Kedung Keris	Pringsurat	Sendowo Kidul	Total
Yes	24 (73%)	26 (87%)	18 (82%)	68 (80%)
Yes, but few	9 (27%)	4 (13%)	4 (18%)	17 (20%)
No	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Total	33 (100%)	30 (100%)	22 (100%)	85 (100%)

Source: Field Research (2010)

Table 7. Awareness of labour power for privately owned forest management

Labour power for forest management	Kedung Keris	Pringsurat	Sendowo Kidul	Total
Still enough	19 (58%)	9 (30%)	3 (14%)	31 (37%)
Still enough but has begun decreasing	14 (42%)	21 (70%)	18 (82%)	53 (62%)
Already too few	0 (0%)	0 (0%)	1 (4%)	1 (1%)
Total	33 (100%)	30 (100%)	22 (100%)	85 (100%)

Source: Field Research (2010)

Discussion

The findings show that a gap exists between the definition by the MoF and the actual POF (*Hutan Rakyat*) in Kedung Keris village. Actual POFs are formed by combining small-scale private lands (i.e. *pekarangan*, *tegalan*, and *alas*), and the average of each land area was less than 0.25 ha. Therefore, if we directly applied the definition by the MoF, most of the *pekarangan*, *tegalan*, and *alas* parts of land would not be included as POF, because their mean areas are less than 0.25 ha. Awang (2005a) argued that this decision by the MoF is the most serious obstacle caused by the government's stated knowledge, and suggested that *Hutan Rakyat* should be redefined as the area of land with planted trees and annual crops harvested by individuals and community groups on privately owned land, communal land, company land, and land controlled by the state government. Thus, it is necessary to redefine the *Hutan Rakyat* based on the entity for appropriate forest policy.

Traditionally, harvesting of POFs is conducted according to personal needs. Hinrichs, Muhtaman & Irianto (2008) observed that this harvesting system was unlikely to change immediately after certification and might be a hindrance to outsiders who wish to purchase wood and create obstacles for

innovative marketing initiatives. In contrast, this study shows that all respondents who have cut immature trees would not have cut the trees if they had had an alternative way to obtain money, thus evidencing a gap between the actual phenomena and a personal intention of local people. PKTHR also has already established rules about cutting trees of certain ages and provided loans of an appropriate capacity. In order to produce larger diameter logs, local people have to tend trees until they mature over long period, during which time they cannot obtain an income. The establishment of a micro finance loan for farmers is, therefore, very important to prevent cutting of immature trees. This micro finance loan using the deposit from KWML members probably improves the harvesting system from traditional system according to personal needs to modern system according to tree growth increments. As well, the role of district government is very important in order to avoid cutting immature trees because they cut those for education and hospital expenditures. Accordingly, improvement of social welfare of farmers can prevent cutting of immature trees, and it is expected that POKJA-HRL would aggressively address the social welfare agenda for sustainable POF management.

This modern harvesting system also probably enables KWML to expand trading partners and develop the certified timber market. Hinrichs, Muhtaman & Irianto (2008) reported that even though KWML received an offer of a significant price, it did not accept the contract owing to an imbalance between wood demand by buyers and wood supply by KWML. As with the PHBML certification case in the Wonogiri district of East Java that also acquired PHBML certification (Harada 2006; Harada 2010, Scheyvens, Harada & Hyakumura 2007, Takahashi 2008), community-based enterprises typically harvest low volumes of timber on an irregular basis, making the filling of international orders a major challenge (Scheyvens, Harada & Hyakumura 2007). In order to ensure a steady wood supply, it is important that KWML collect timber from its members. Hinrichs, Muhtaman & Irianto (2008) posited that 1) instant payment and 2) buying prices higher than the open market were necessary, as the condition of selling timber by farmers and KWML needed to be able to prefinance timber purchases from farmers.

Meanwhile, an expanded certification area also effectively ensures that wood supply meet the great demand from wood processing industries. In 2009, 85,404 m^3 teak logs were produced in POFs in GK (Statistics from the Forest Agency, GK district). In contrast, teak logs produced by KWML (135.5 m^3 per month) accounted for just 2% of the total at the highest estimate. Additionally, in concrete terms, whereas teak furniture industries in Jepara demand between 1.5 and 2.2 million m^3 of round wood per year (Roda et al. 2007; Rohadi et al. 2010), the maximum productive capacity of teak timber by KWML is only 1626 m^3 per year (135.5 m^3 per month)-- a huge gap between

wood demand and wood supply by KWML. The GK district government has targeted an additional 69 villages for certification; these areas cover 15,000 ha and produce a maximum annual production of 40,000 m^3 of predominantly teak timber (Hinrichs, Muhtaman & Irianto 2008). The expansion will better enable the district to meet huge demand by sharing the volume among a greater number of villages. KWML has high potential to become a bargaining front for its members by controlling timber trade mechanisms and improving current weak bargaining positions of farmers, thus obtaining the capacity to meet the wood demand.

Self-help efforts by KWML as well as efforts by third parties are very important to promote sustainable POF management with the forest certification. It takes and costs much effort, time, and money to acquire certification. In order to establish KWML, it took two years and cost between 50,000 and 65,000 USD per village for the preliminary stage of preparation and 10,000 USD for the certification acquisition cost (Hinrichs, Muhtaman & Irianto 2008). Also, promoters of the forest certification stirred up farmers' interests in forest certification by promising higher timber prices of 20-30% as premium price (Hinrichs, Muhtaman & Irianto 2008). Therefore, local expectation for the premium price is very high. Although KWML members have been able to sell timber at prices 10-15% higher to the KWML, the expected timber price has not been reached.

One of the reasons why the certified timber price is still low is that KWML still does not have the capacity to ensure the stable supply to meet the demand. On the other hand, in order to raise the certified timber price, it is also essential that LEI and international markets make an effort to develop the certified timber market. There are only two timber-processing companies that have achieved Chain of Custody (CoC) certification of LEI[2]. Because the one company targets only timber derived from natural forests, there is virtually only one company that can accept the LEI certified timber produced in POFs, including KWML timber. In order to distribute LEI certified timber to home and abroad, therefore, it is key that the CoC company of LEI expands and begins to accept certified timber from villages (Harada 2010). At the same time, accession to international accreditation bodies, conveyance of information by accurate English websites, promotion of mutual recognition along with other certifications, and additional such measures, are important to promote LEI for buyers in particularly critical marketplaces (Maryudi 2009). Also, in aspects of certification replicability, premium prices are important. While the cost of certification has not been met directly by forest holders in all cases of the LEI certified CBFM in Indonesia (Maryudi 2009),

[2] The two companies are PT. Uniseraya, Riau and PT. Jawa Furni Lestari, DI Yogyakarta (Lembaga Ekolabel Indonesia: http://www.lei.or.id/sertifikasi-coc).

heavy subsidies pose problems for replication (Scheyvens, Harada & Hyakumura 2007). In the KWML case, its total certification cost was funded by the United Kingdom's Department for International Development (DFID)(Hinrichs, Muhtaman & Irianto 2008). The certification is valid for 15 years, and KWML will have to reacquire it after it expires. The acquisition cost of certification is one of investment costs, and it is essential to be recovered through the premium price for the certification replicability. The premium price is, therefore, very important not only as an incentive for farmers but also for the certification replicability.

The GK district has made efforts to establish the POFMU for SFM, and the forest certification has been utilized as one of the tools in this effort. Although many farmers continue to cut according to their personal needs rather than joint planning goals (Hinrichs, Muhtaman & Irianto 2008), establishment of joint forest planning though PKTHR at the village level represent a significant step toward the POFMU which, in turn, has great potential for overcoming POF vulnerability by small-scale POF integration. Conversely, this study identified the obstacles to the POFMU promotion. The shrinking of POFs caused by the traditional inheritance system is one of the obstructive factors. This shrinkage is a regressive phenomenon that hinders POF integration for the POFMU. In case of Kedung Keris village, children who live in the outer village also have the right to receive private land as an inheritance under the traditional inheritance system. Although almost all the respondents believed that their children would surely return to the village to manage the POFs, this remains uncertain.

Given that Japanese past experience, as a result of population outflow from villages to cities, the residences of forest owners tend to become decentralized and spread out (Ootsuka & Fujikake 2000), population outflow from villages to cities, inheritances left to children who live in cities, and the buying and selling of forest land are the main causes of absentee landlord problems. Thus, the absentee problem has led to a decline the forest management level, and has influenced other POF management systems, such as the building of forest roads and yarding spurs, joint harvesting under collective management, and maintenance of forests' public benefit functions (Hirata 1996, Ryuko 2000, Sato 2003, Nakazato & Noguchi 2007). The movement of migrants to cities and to peri-urban areas has been a feature in all Southeast Asian contexts; however, urbanization trends have been particularly dramatic in Indonesia, Lao PDR, Malaysia, East Timor, and the Philippines (Kelly 2011). In 2010, 44.3% of Indonesians lived in urban areas, and it is estimated that the number is expected to rise to 65.9% by 2050 (UN 2010). Consequently, the recent mobility of forest villagers has reduced their dependence on forest lands, and these other sources of income have been transforming household livelihood portfolios in some parts of rural Java

(Peluso 2011). Peluso (2011) observed apparently steep and rapid decline in fertility because most women gave birth to only one or two children in the village, and it would also affect labour availability in the future. Therefore, the POFMU development should be considered with a view toward the long-term. In order to develop POFMU, consensus among POF owners is essential. Absenteeism from the land will probably become a serious obstructive factor for further POFMU development; therefore, it is important to establish a new agreement and/or consensus among the KTHR at the sub-village, PKTHR at the village, and KWML at the district level.

In sum, based on the above discussion, certification plays an important role to promote collective POF management though POFMU. Identification of the growth increments for trees though the certification acquirement process is also effective in encouraging more sustainable POF management by farmers and farmer's groups. By contrast, even though many farmers expect the premium price, it has not yet achieved this in GK. The current timber price is not big incentive for farmers. As well, even though it took a huge acquirement cost of forest certification, it is also opaque whether KWML can recover the acquirement cost as investment cost by the premium price or not. The main reasons are the supply and demand imbalance of certified timbers and very limited CoC certification of LEI. In order to generate premium price which serves as a big incentive for farmers and enables KWML to recover acquirement cost of certification, these issues should be addressed by KWML, POKJA-HRL, and LEI in an integrated fashion. It is very important to consider transforming people's livelihood mode for sustainable POF management over a long period of time. While the model of POFMU with forest certification has great potential to encourage sustainable POF management, the sustainability of the model is still a big challenge in GK.

Conclusion

In recent years, the timbers produced at POF have been spotlighted in Indonesia. Through the series of decentralization and devolution of forest management and agrarian reform, the area of forest owned and managed by local people and communities will increase in Indonesia. However, current POF management still remains vulnerable to wood demand. To overcome vulnerability, the POFMU approach has great potential to achieve both goals of stable wood supply and forest conservation. The certification program is utilized for promoting collective forest management by integrating small-scale POFs, and the cooperative association, as self-help efforts by local people themselves, also helps to ease the obstructive factors and make more efficient and sustainable POF management. Eventually, it is expected that POFs are managed together with SFs in one joint forest planning as an integrated system for regional forest management at the watershed unit level. In order to

produce larger diameter logs and meet wood demand from market and wood industries, local people are required to manage POF and navigate both economic and social factors over long period. Therefore, efforts by third parties-- such as a development of the market where local people can sell their timber at suitable prices, and forest policy which supports collective POF management-- are also important to keep local people's motivation high for the longstanding POF management.

Acknowledgements

This research was conducted with the permission (No.0253/FRP/SM/X/2009 and No.42/SIP/FRP/SM/IX/2010) of RISTEK, Republic of Indonesia. Also, we gratefully acknowledge research grants from Kyushu University Interdisciplinary Programs in Education and Projects in Research Development and the Fuji Xerox Setsutaro Kobayashi Memorial Fund. Mr. Suradal (Head of Pringsurat sub-village) and Mr. Suryanto Sadiyo (ARuPA) worked as a bridge between research team and local people. We wish to thank Dr. Kimihiko Hyakumura (Kyushu University), Mr. Kazi Kamrul Islam (Kyushu University), and Ms. Popi Astriani (Center for International Forestry Research-CIFOR) for a thorough review of the manuscript.

References

Awang, S.A. 2005a. "Konstruksi Pengembangan Hutan Rakyat di Indonesia" [Construction of Community Forest Development in Indonesia]. Paper present at the Seminar Nasional Pengembangan Pengelolaan dan Pemanfaatan Hasil Hutan Rakyat di Indonesia [National Seminar on Production Utilization, Management Development of Community Forest in Indonesia]. Yogyakarta, Gadjah Mada University, December 12. (in Indonesian).

Awang, S.A. 2005b. "Manajemen Hutan Rakyat Kolaboratif di Tingkat Kawasan" [Collaborative Community Forest Management in Region Level]. In Awang S.A. (ed). *Petani, Ekonomi, dan Konservasi: Aspek Penelitian dan Gagasan* [*Farmer, Economy, and Conservation: Aspects of Research and Ideas*]. Yogyakarta: Debut Press. (in Indonesian).

Awang, S.A., Wiyono, E.B., and Sadiyo, S. 2007. *Unit Manajemen Hutan Rakyat: Proses Konstruksi Pengetahuan Lokal* [*Community Forest Management Unit: Local Knowledge Construction Process*]. Yogyakarta: Banyumili Art Network. (in Indonesian).

[BPKH] Balai Pemantapan Kawasan Hutan Wilayah XI Jawa-Madura. 2006. *Kajian Hutan Rakyat: Provinsi DI Yogyakarta* (*Edisi Lengkap*) [*Research on Community Forests: Yogyakarta Special Region Province* (*Complete Edition*)]. Yogyakarta: Balai Pemantapan Kawasan Hutan, Departmen Kehutanan. (in Indonesian).

[FAO] Food and Agriculture Organization of the United Nations. 2010. *Global Forest Resources Assessment 2010*. Rome: FAO.

Guritno, A.D. 2000. "Indonesian Forest Management Problems: What are the Comments and Opinions of the Groups and Organizations Concerned?" *Southeast Asian Studies* 37(4):492-510

Harada, K. 2006. "Chiiki Jumin Ga Shutai To Natta Shinrin Ninsho Seido no Jittai: Indonesia Higashi Java no Jirei" [Reality of Local People Centered Forest Certification Systems: the East Java Case, Indonesia]. *Sanrin* 1467:28-35 (in Japanese).

Harada, K. 2010. "Indonesia Ni Okeru Chiiki Jyuumin Wo Taisho To Shita Shinrin Ninsho Seido: Chiiki Shakai Heno Tekiyou to Kadai" [Forest Certification System for Local People in Indonesia: Application and Challenge to Local Society]. In Ichikawa, M., Ubukata, F., and Naito, D. (eds) *Nettai Asia no Hitobito to Shinrin Kanri Seido: Genba Kara no Governance Ron* [*People and Forest Management in Tropical Asia: Local-level Impact of Diverse Governance Systems*]. Kyoto: Jimbunshoin (in Japanese).

Hinrichs, A., Muhtaman, D.R., Irianto, N. 2008. *Forest Certification on Community Land in Indonesia*. Jakarta: Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ).

Hirata, K. 1996. "Study on Forest Management at an Area by Forest Owners' Association." *Journal of Forest Economics* 129:159-164 (in Japanese).

Ichwandi, I., Shinohara, T., Darusman, D., and Nakama, Y. 2005. "Characteristics of Private Forest Management in Java, Indonesia: Two Case Studies." *Journal of Forest Economics* 51(2):1-12

Ichwandi, I., Shinohara, T., and Nakama, Y. 2007. "The Characteristics of Private Forest Management in Wonogiri District, Central Java, Indonesia and It's Contribution to Farm Household Income and Village Economy." *Tropics* 16(2):103-114

Iwanaga, S., Akaba, H., Onda, N., and Masuda, M. 2010. "Strategy of a Timber Processing Company for Ensuring Raw Materials and Supply Potential of Private Land: A Case Study in Tasikmalaya, West Java, Indonesia." *Bulletin of Tsukuba University Forests* 26:1-16 (in Japanese with English abstract)

Kelly, PF. 2011 "Migration, agrarian transition, and rural change in Southeast Asia." *Critical Asian Studies* 43(4):479-506

[KWML] Koperasi Wana Manunggal Lestari. 2006a. *Buku I Dokumen Pengajuan Sertifikasi Pengelolaan Hutan Berbasis Masyarakat Lestari (PHBML) Unit Manajemen Hutan Rakyat Desa Girisekar, Desa Dengok, Desa Kedung Keris, Kabupaten Gunung Kidul* [*Book I Submitted Document of the Sustainable Community Based Forest Management (PHBML) Certification and Community Forest Management Unit in Girisekar Village, Dengok Village, Kedung Keris*

Village, Gunung Kidul District]. Gunung Kidul, Yogyakarta: KWML. (in Indonesian)

[KWML] Koperasi Wana Manunggal Lestari. 2006b. *Buku IIc Dokumen Unit Manajemen Hutan Rakyat Desa Kedung Keris Sertifikasi Pengelolaan Hutan Berbasis Masyarakat Lestari (PHBML) Unit Manajemen Hutan Rakyat Desa Girisekar, Desa Dengok, Desa Kedung Keris, Kabpaten Gunung Kidul* [*Book IIc Document of the Community Forest Management Unit in Kedung Keris, Sustainable Community Based Forest Management (PHBML) Certification, Community Forest Management Unit in Girisekar Village, Dengok Village, Kedung Keris Village, Gunung Kidul District*]. Gunung Kidul, Yogyakarta: KWML. (in Indonesian)

Maryudi, A. 2009. *Forest Certification for Community-based Forest Management in Indonesia: Does LEI Provide a Credible Option?* Hayama: Institute for Global Environmental Strategies (IGES).

Nakazato, T., and Noguchi, T. 2007. "The Problem of Forest Management with Land Owners Living Outside Villages: A Case of Tenryu Village in Nagano Prefecture." *Forest Economy* 60(5):1-12 (in Japanese)

Nawir, A.A., Santoso, L., and Mudhofar, I. 2003. *Towards Mutually-beneficial Company-community Partnerships in Timber Plantation: Lesson Learnt from Indonesia. Working Paper No. 26.* Bogor: Center for International Forestry Research (CIFOR).

Nawir, A.A., and Santoso, L. 2005. "Mutually Beneficial Company-community Partnerships in Plantation Development: Emerging Lessons from Indonesia." *International Forestry Review* 7(3):177-192

Nawir, A.A., Murniati, Rumboko, L., Hiyama, C., and Gumartini, T. 2007. "Portraits of Rehabilitation Projects in Indonesia: Impacts and Lesson Learnt." In: Nawir, A.A., Murniati, Rumboko, L. (eds). *Forest Rehabilitation in Indonesia: Where to after More Than Three Decades?* Bogor: Center for International Forestry Research (CIFOR).

Nemoto, A. 2003. "Farm Tree Planting and the Wood Industry in Indonesia: A Study of Falcataria Plantations and the Falcataria Product Market in Java." In: IGES Forest Conservation Project. *Policy trend report 2001/2002*. Hayama: Institute for Global Environmental Strategies (IGES).

Noordwijk, M.V., Suyanto, S., Budidarsono, S., Sakuntaladewi, N., Roshetko, J.M., Tata, H.L., Galudra, G., and Fay, C. 2007. *Is Hutan Tanaman Rakyat a New Paradigm in Community Based Tree Planting in Indonesia? ICRAF Working paper no.45.* Bogor: World Agroforestry Centre

Obidzinski, K., and Chaudhury, M. 2009. "Transition to Timber Plantation Based Forestry in Indonesia: Towards a Feasible New Policy." *International Forestry Review* 11(1):79-87

Obidzinski, K., Dermawan, A. 2010. "Smallholder Timber Plantation Development in Indonesia: What is Preventing Progress?" *International Forestry Review* 12(4):339-348

Ootsuka, M., Fujikake, I. 2000. "Residential Mobility and Forest Ownership: the Case Study of Graduates of Osugi Elementary School, Miyagawa Village, Mie Prefecture." *Journal of Forest Economics* 46(2):37-42 (in Japanese)

Peluso, NL. 2011. "Emergent forest and private land regimes in Java." *Journal of Peasant Studies* 38(4): 811-836.

Pramono, A.A., Fauzi, M.A., Widyani, N., Heriansyah, I., and Roshetko, J.M. 2010. *Pengelolaan Hutan Jati Rakyat: Panduan Lapangan untuk Petani* [*Community Teak Forest Management: Field Guide for Farmers*]. Bogor: Center for International Forestry Research (CIFOR). (in Indonesian)

Purnomo, H., Melati, and Irawati, R.H. 2009. *Furniture and People: A Photo Journey from Market to Forest.* Bogor: Center for International Forestry Research (CIFOR).

[PKHR] Pusat Kajian Hutan Rakyat. 1999. *Laporan Penelitian Pengelolaan dan Pengembangan Hutan Rakyat (Studi Kasus Desa Kedungkeris, Gunung Kidul)* [*Research Report on Community Forest Development and Management (Case Study of Kedung Keris Village, Gunung Kidul)*]. Yogyakarta: Pusat Kajian Hutan Rakyat (PKHR), Faculty of Forestry, Gadjah Mada University. (in Indonesian)

[PKHR] Pusat Kajian Hutan Rakyat. 2006. *Laporan Akhir Rancang Bangun Unit Manajemen Hutan Rakyat Lestari* [*Final Report on Construction Design of Sustainable Privately Owned Forest Management Unit*]. Yogyakarta: Pusat Kajian Hutan Rakyat (PKHR), Faculty of Forestry, Gadjah Mada University. (in Indonesian)

Roda, J.M., Cadène, P., Guizol, P., Santoso, L., and Fauzan, A.U. 2007. *Atlas of Wooden Furniture Industry in Jepara, Indonesia*. Montpellier, France: French Agricultural Research Centre for International Development (CIRAD) and Bogor: Center for International Forestry Research (CIFOR).

Rohadi, D., Kallio, M., Krisnawati, H., and Manalu, P. 2010. *Economic Incentives and Household Perceptions on Smallholder Timber Plantations: Lessons from Case Studies in Indonesia*. Paper presented at the Conference on Agricultural Research for Development, Montpellier, 24-26 March.

http://ittoiswa.com/userfile/publication/20110429_083454Dede%20Rohadi_Smallholder%20timber%20production%20in%20Indonesia.pdf (Accessed on July 20, 2011).

Ryuko, H. 2000. "Fuzaison Shoyu no Doukou to Kongo no Shinrin Kanri Mondai" [Trend in Absentee Land Ownership and Future Forest Management Issues]. In Shiga, K., and Narita, M. (eds). *Gendai Nihon no Shinrin Kanri Mondai: Chiiki Shinrinkanri to Jichitai, Shinrin Kumiai* [*Forest*

Management Issues in Present-day Japan: Regional Forest Management, Local Government, Forest Owners' Association]. Tokyo: National Federation of Forest Owners' Co-operative Association (in Japanese)

Sasono, M.J. 2006. "Kelompok Kerja Hutan Rakyat Lestari Kabupaten Gunung Kidul" [Sustainable Community Forest Working Group in Gunung Kidul]. Presented at the Workshop on Sustainable Private Forests with Certification. Wonosari, Gunung Kidul, February 14. (in Indonesian)

Sato, N. 2003. "Shinrin Shoyu no Kouzou Henka to Chiiki Tokusei" [Structural Changes in Forest Ownership and Regional Characteristics]. In Sakai, M. (ed). *Shinrin Shigen Kanri no Shakaika* (*Socialization of Forest Resources Management*). Fukuoka: Kyushu University Press (in Japanese)

Scheyvens, H., Harada, K., and Hyakumura, K. 2007. "Incorporating Certification into a Pro-poor Forestry Agenda: Lessons from and Options for the Asia-Pacific Region." Paper presented at the International Conference on Poverty Reduction and Forest-tenure, Market and Policy Reforms. Bangkok, September 3-7.

Simon, H. 2008. Pengelolaan Hutan Bersama Rakyat (Cooperative forest management) [Forest Management Together with People (Cooperative forest management)]. Yogyakarta: Pustaka Pelajar. (in Indonesian)

Supriadi, D. 2002. "Pengembangan Hutan Rakyat di Indonesia" [Community forest development in Indonesia]. *Jurnal hutan rakyat* 4(1):23-33 (in Indonesian)

Takahashi, S. 2008. "Challenges for Local Communities and Livelihoods to Seek Sustainable Forest Management in Indonesia." *The Journal of Environment & Development* 17(2):192-211

[UN] United Nations, Department of Economic and Social Affairs, Population Division. 2010. World urbanization prospects: the 2009 revision.

http://esa.un.org/unpd/wup/index.htm (Accessed on November 19, 2011).

Wardojo, W., Masripatin, N. 2003. "Trends in Indonesian forest policy." In: IGES Forest Conservation Project. *Policy trend report 2001/2002*. Hayama: Institute for Global Environmental Strategies (IGES).

Widayanti, W.T., Himmah, B., and Awang, S.A. 2005. "Manajemen Sistem Hutan Rakyat Menuju Model Sertifikasi (Pengalaman di Desa Kedungkeris, Kecamatan Nglipar, Kabupaten Gunung Kidul)" [Community Forest Management System toward the Certification Model (Experience in Kedungkeris Village, Nglipar Sub-district, Gunung Kidul District)]. *Jurnal Hutan Rakyat* 7(3):1-24 (in Indonesian)