

Property Rights and Environmental Services in Lampung Province, Indonesia¹

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1. Introduction

In 1999, Mr. Ading Suwarna, the leader of the village of Tribudi Syukur in the Sumberjaya subdistrict of Lampung province in Sumatra, Indonesia, heard from a local forest officer about a new community forestry program providing farmers with long-term licenses to use degraded protected state forest land for coffee production, provided that they protect the remaining forest, plant environmentally beneficial agroforestry trees in their coffee plantations, and use appropriate soil and water conservation practices. This program offered a new and potentially more effective approach to achieving sustainable forest management in Indonesia. Several times in the previous two decades, coffee farmers in Tribudi Syukur and many other communities had been forcibly evicted from state forest land areas, their plantations destroyed, and forest trees planted by the government. Such efforts did not produce lasting protection or restoration of the forest areas, which were ravaged by subsequent fires and illegal encroachments. The new community forestry, or *Hutan Kamasyarakatan* (HKm) program, sought to take a different approach, rewarding farmers with increased tenure security in already degraded areas in exchange for their cooperation in protecting the remaining forests and managing the land they were using more sustainably.

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Mr. Ading Suwarna organized a group of 493 farmers to apply for a license from the HKm program, and with assistance from a forest officer they were able to complete the application, including a detailed map of the areas proposed for protection and sustainable use and a specific management plan. In 2000 this group of farmers obtained their license and began their forest management activities, including organizing a local group of rangers to monitor remaining forest areas, obtaining and planting agroforestry seedlings, and meeting regularly.

The impacts of this program on the sustainability of forest use and on poverty in Indonesia are not yet known. Tribudi Syukur's experience suggests that providing such rewards in exchange for environmental services is a promising approach, but it raises several issues worthy of investigation. How do people become aware of and gain access to such a program? Are only "well connected" villages with knowledgeable leaders able to take advantage? How do community members organize themselves to apply and achieve the management objectives of the program? Do they build upon prior successes in organizing collective action within the community? Who gains and who loses from these activities? Do such programs actually provide sustainable environmental benefits, and what impacts do they have on poverty? This paper presents initial findings from a survey of communities, HKm groups and households in Sumberjaya, focusing on the process of establishing HKm groups along with some indicators of expected program impacts.

2. Payment for Environmental Services

In recent years the idea has taken hold that forest conservation in developing countries stands a better chance of success if local inhabitants see economic opportunity in protection rather than destruction of natural areas. The last decade has seen growing interest in compensating local people directly for providing environmental services such as biodiversity

conservation, carbon sequestration and watershed protection. While high profile payment for environmental service (PES) programs have emerged in Costa Rica and other Latin American countries, elsewhere in the developing world they remain uncommon.

Environmental service reward mechanisms generally entail some shift in attitude toward rural natural resource users. Traditionally, rural people living in or near protected areas have been viewed as troublesome squatters; evicting them or curtailing their land use activities were seen as the best way to improve land management. A subsequent approach known as Integrated Conservation and Development sought to build goodwill with local people by bringing them development benefits in the hope of shifting the local economy away from protected areas, but it did not directly link benefits to provision of environmental services. Rewarding people for environmental services builds on the idea of creating goodwill and takes the additional step of making the receipt of benefits contingent on protection of the resource (Ferraro 2001).

While this represents a potential improvement over previous approaches to protecting environmentally sensitive ecosystems, PES introduces challenges of its own. Identifying and measuring environmental services is often difficult and costly (van Noordwijk et al. 2004, Pagiola et al. 2002). It is worth keeping in mind that environmental services normally have no markets precisely because of these difficulties. In addition, hopes for using PES to benefit poor people are balanced by fears that it might bypass them or even make them worse off. Challenges related to high transaction costs of dealing with small landholders and unclear property rights in areas with high conservation value need to be overcome. It is usually easier and less expensive to make and enforce contracts with a few large landowners rather than thousands of smaller ones, and it is easier and more affordable for large landowners to set aside large areas of land in a long term contract than for small holders who need to meet subsistence production needs. Secure,

officially recognized land tenure is typically required to enter into contractual relations, but poor farmers often lack such recognition. These constraints have been found to exclude smallholders from environmental service markets in many countries. In Costa Rica, Zbinden and Lee (2005) found that participants owned on average 2-to-6 times as much land as nonparticipants and each additional 10 hectares owned led to a 27% greater likelihood of program participation. Moreover, where land rights are unclear, there are concerns that PES systems might lead powerful people to usurp otherwise marginal lands and evict poor land users.

PES mechanisms are spreading in Latin America, but they are still nascent in Asia. With funding from the International Fund for Agricultural Development (IFAD), the World Agroforestry Centre (ICRAF) established the RUPES (Rewarding Upland Poor for Environmental Services) project in 2001 to address possibilities for these mechanisms in Asia, with particular emphasis on potential for the upland poor to benefit (ICRAF, 2002). The RUPES project is working with international, national and local partners in building working models of best practices for environmental service agreements adapted to Asian contexts. It conducts action research at sites across Asia to examine the provision of environmental services, who benefits, who pays, and the institutional and policy environment needed to enable fair and equitable distribution. RUPES takes an inclusive view on payment mechanisms, including rewards that provide upland farmers with enhanced land tenure security in exchange for adhering to land use agreements. RUPES calls such arrangements Rewards for Environmental Services (RES).

3. Research Questions

The research on which this paper is based examines RES experiences at a RUPES site in Indonesia, focusing on: 1) the social-spatial placement of RES mechanisms, and 2) the within-village distribution of costs and benefits of RES mechanisms related to enhanced property rights.

The research program operates in the watershed of Sumberjaya in the West Lampung district of Lampung Province, Sumatra, where RES mechanisms are being used for forest and watershed rehabilitation and protection services as described above.

The central hypothesis of this research is that environmental service reward mechanisms may provide marginalized social groups with new opportunities for generating income, obtaining more secure rights to land and water, and being included in environmental governance processes. There are two ancillary hypotheses. First, due to limited spread of information and incomplete appreciation of the opportunities, there is a tendency for RES mechanisms to be located in communities with high levels of interaction with the outside world, with their actual ability to efficiently provide the environmental service only as a secondary criterion. Second, there is a tendency for the benefits of RES to be captured by well-advantaged households within communities. The research investigates these hypotheses, with the goal of determining ways in which RES mechanisms can be designed to reduce or overcome these tendencies.

Discussions with Sumberjaya farmers revealed their conviction that HKm offers the opportunity for a secure livelihood. Some suggest it will bring them into the mainstream of society, no longer outlaws who must bribe forest officers to continue earning their living on restricted public land. They describe the steps they are taking to manage previously deforested land in a sustainable manner and protect remaining natural forests, acting for the first time as partners with the government. This suggests that land rights can be used as an environmental service reward mechanism. This experience presents an opportunity to test the key hypotheses introduced above. In Sumberjaya, this translates into several key research questions. In particular:

- Can secure land tenure through HKm be utilized as a reward mechanism to encourage

farmers to utilize land resources sustainably and protect natural forest areas? What impacts does it have on watershed and forest protection?

- Are HKm agreements placed in better connected communities as opposed to those where they hold the greatest promise to deliver environmental services?
- Are the benefits of HKm captured primarily by better off people in the communities where it has been implemented? What particular issues arise when the reward mechanism involves secure land rights as opposed to monetary payments?
- What institutional mechanisms can be used to help mitigate unintended negative outcomes or spread the benefits of HKm more widely? For example, what institutional changes could be introduced that might strengthen the link between receiving the reward and providing the environmental service?

This paper is a preliminary output of a larger study. Based mainly on a community survey, it focuses primarily on how HKm groups are established, including the process they must follow and the determinants of program placement in Sumberjaya. Survey data also cover community respondents' expectations of their rights and responsibilities and the program's impacts. Subsequent analysis will analyze program impacts more thoroughly using household and plot surveys.

4. Research Setting

4.1. Sumberjaya

Sumberjaya has been inhabited since about 1884, when Semendo people from nearby areas of present-day Lampung Province first settled in the area and practiced shifting cultivation. The development of Sumberjaya started in 1951 with the national transmigration program in which people from the densely settled island of Java were moved to different islands.

Sumberjaya's three main ethnic groups are Javanese and Sundanese (both from Java) and Sumendo (from southern Sumatra). Migrants often follow their ethnic kin and many villages are mostly homogeneous, but others are more mixed. Sumberjaya contains a combination of private land, protection forest (government land to be kept under land use that protects watersheds), and a national park. Private agricultural lands in the lower reaches contain rice paddy land, with the surrounding slopes devoted to coffee gardens.³

In the 1980s coffee plantations spread to protection forest and the national park. In the early 1990s the Government of Indonesia, under the former President Suharto, forcibly evicted people from much of the protection forest area. This action preceded the construction of a small hydroelectric plant in the river at the outlet of the watershed, in line with the perception that agriculture in the upper watershed would cause problems for the hydroelectric plant. The key fears were that agriculture would reduce the flow of water available for the plant and cause siltation that could damage the turbines.⁴ Upon eviction, local people retaliated by burning the remaining vegetation.

In the late 1990s the convergence of several factors led settlers to return to the areas from which they had been evicted. The Asian financial crisis left many people jobless, the price of coffee rose sharply due to production problems in Brazil, and the Suharto government fell, replaced by a new, reform-oriented government. The new government introduced a program of *Reformasi* (reform), which aimed to be more decentralized and people-friendly.

4.2. The HKm program

³ Due to the low altitude, Sumberjaya farmers grow low grade Robusta coffee varieties.

⁴ Recent ICRAF research suggests that both of these fears were misplaced. First, agriculture yields more water downstream through runoff and subsurface flow than natural forests; second, filtering effects in the landscape mean that erosion in the upper reaches does not necessarily reach the river. Silt in the river originates largely from land use in the lowlands closer to the river and from erosion of unpaved roads in the watershed. Ironically, the government's action most likely increased erosion, because ICRAF's research suggests that well-established coffee plantations do not erode very much. Sources: personal communication with Meine van Noordwijk, ICRAF, November 2004, and van Noordwijk et al. (2004).

HKm is based on a decree from the Ministry of Forests that specifies that production forests and protection forests that have already been deforested are eligible. Under the program, groups of people are given individual rights on state protection forest land as long as they promise to plant multistrata⁵ coffee, conserve soil and water, and protect remaining natural forest areas. This approach is illustrative of the *Reformasi* approach to governance, and is consistent with what ICRAF terms “kebun lindung,” or achieving watershed protection through agroforestry as opposed to natural forest. The HKm contracts last an initial 5 years probationary period before possibly being extended for another 25 years.⁶

4.2.1. HKm in Sumberjaya

To date the area under HKm is very small. The first contracts in West Lampung district were signed in 2000 in Sumberjaya; around 10 are now in force (6 in Sumberjaya) with others under negotiation. Out of about 40-50,000 ha eligible area in the district, so far only about 2000 ha is under HKm agreements with an additional 13,000 ha in Sumberjaya in the process of applying for HKm. Nationwide, the total area under HKm is 50,644 ha as of this writing. The process is more advanced in Sumberjaya than in other areas most likely due to the involvement of ICRAF, which received a grant to help promote the program and support negotiations between communities and government.

HKm contracts cover groups of people. The group approach makes sense to reduce transaction costs, and all group members are people who previously had customary tenure. The only people excluded are those who migrated away from the area and did not return;

⁵ Multistrata agroforestry refers to a mix of different species of different heights. Tall, sun-loving trees shelter those that require less sunshine (including coffee), and trees with different root lengths exploit soil and resources differently. Together they exploit resources more efficiently and provide better soil cover to reduce erosion.

⁶No HKm contracts have yet been extended for 25 years, in part due to lack of clear regulations about this from the Ministry of Forests.

interviewees indicated that such people could negotiate their way back into the group if they were to return to the area.

To apply for a HKm permit requires several steps. People using protection forest land in a contiguous area form a group and then submit a proposal to the Forest Department. The proposal must include a map of the proposed area (assembled by the community with assistance from the Forest Department) that indicates the area where they can plant coffee and the natural forest area that they will protect against logging and forest fires. They agree to a contract that specifies the tree composition of the multistrata coffee plots they will maintain and they agree to implement soil and water conservation practices. The contract requires planting at least 400 timber and fruit trees per ha in the coffee gardens, with flexibility on which species to plant. Required soil conservation measures include terraces, sediment pits, grass strips, and planting along the contour. In some areas group members must pay an annual fee, but the fee varies by district. In one village in neighboring Tanggamus District the annual fee was Rp. 36,000, or about \$4, per hectare. Some residents consider this to be high as it exceeds the tax that landowners pay. It is based on the price of coffee at the time the agreement was negotiated; at the time coffee prices were high but more recently they have been very low. As a result of the low coffee price, in Sumberjaya there is no annual fee for the time being. On the basis of these terms the groups get a probationary HKm permit for five years, at which time they are to be evaluated and become eligible for an extension up to 25 years.

5. Data

Data for the study were collected at the community and household levels. Community level investigations focus on the processes that determine how communities learn about the program, form into the groups that are required to apply for the program, go through the

application process, obtain the license, and carry out their responsibilities. The emphasis in this portion of the research is on questions related to bridging and bonding social capital (Krishna 2002). Bridging social capital is the network of social relationships that brings access to economic opportunities and special programs; i.e. – do communities with good connections to the right people gain access to HKm before others? Bonding social capital is the set of social relationships that enables groups to work collectively in an effective way – are there identifiable factors that characterize those groups that have come together to benefit from HKm and delivered on their responsibilities?

The community level survey was conducted in all of the villages in Sumberjaya where there is protection forest, and includes all of the groups that have obtained HKm permits or are applying for HKm permits, and subgroups within the HKm groups.

At the village level, questions were designed to address the factors that affect the emergence of HKm groups, including awareness of the program and formation of groups to apply for HKm permits. At the group level, questions focus more on the process of forming the groups and applying for permits, including the enabling factors for forming groups and the constraints faced. Questions also address perceived or anticipated impacts of the program and performance of the group. Each group comprises many subgroups and some performance indicators are available at the subgroup level, so a small survey covers the subgroup level.

The community survey covers 21 of the 28 villages in Sumberjaya (the other 7 villages do not have any protection forest and hence were not eligible for HKm), and 29 groups that have formed for HKm permits, of which 6 have obtained the permit, 2 have formally applied, 9 have begun preparing the application but have yet to submit it, and 12 that are just beginning the application process. The subdistrict covers 54,194 ha, of which 58% is officially state-owned

forest land, and the total population was about 81,000 in 2000 (Verbist and Pasya, 2004).

6. Findings

This section presents descriptive statistics at the village and group level to identify factors associated with the spread of HKm and its anticipated impacts. Statistical tests were not performed because all villages and HKm groups in Sumberjaya were surveyed. Discussion of the data draws upon notes from the survey interviews; some text-based qualitative data still needs to be examined more carefully.

6.1. What factors are associated with placement of HKm agreements?

The HKm program has made the most progress in Sumberjaya compared to other parts of Lampung. In fact, nearly all farmers in Sumberjaya's protection forest area organized into groups for pursuing HKm agreements. The first groups were formed in 2000 and the number of groups has risen steadily since then. There is clearly a regional factor at work as word of the program has spread quite quickly through the area. ICRAF's presence is part of the reason for this progress; ICRAF has a program in place to help people negotiate with the government for precisely this kind of program. Data limitations prevent the analysis from going beyond Sumberjaya, so the investigation focuses on how it spread within Sumberjaya. Also, ICRAF is currently conducting research on the environmental services potential of different areas of Sumberjaya, so it is too soon to determine whether HKm agreements are being implanted in the places where they will be most effective.

As mentioned above, the program was first announced in 1999, shortly after the *Reformasi*. The first people to learn of it in Sumberjaya were in the village of Tribudi Syukur, not coincidentally home to three forest department employees (out of nine living in all of Sumberjaya). This kind

of bridging social capital, or social relationships that help people gain access to programs and services, appears to play a role in spreading HKm, but it is not essential. In Table 1 we see that a higher percentage of villages with HKm groups had personal relationships with forest officials or with NGO officials who were helping to promote the program, but there are exceptions.

Similarly, these villages more frequently had a personal relationship with the person who actually helped them apply for the program (50% of villages with groups that have received HKm permits, compared to 26% of villages where groups have applied for HKm); this may indicate that as the program began to spread the program became less dependent on personal relationships.

Other indicators of bridging social capital also show differences between groups with and without a HKm license. Table 2 shows that licensed groups on average have 40% more motorcycles per member, which is an indicator of wealth but also of mobility for access to the outside world. Their dominant ethnic group is Javanese or Sundanese, which are also the groups that predominate in government.⁷ There is virtually no difference in how long ago the villages were established or when they began cultivating the protection forest, and nearly all groups experienced eviction in the 1990s.

6.2. How do groups organize themselves?

Bonding social capital refers to factors that strengthen relationships within a group, helping them act collectively to take action and solve problems. In this regard, table 2 shows that groups with HKm are more ethnically homogeneous, with a higher concentration of the largest ethnic group. They are also more likely to be Javanese or Sundanese and less likely to be

⁷ Further investigation is needed to know if ethnicity really affects access to government programs.

Sumendo, which is notable as the Sumendo people are known locally for being less inclined to collective action and potentially difficult to work with.⁸

Some studies have suggested that collective action is more likely in one arena when it builds on collective action in another arena (Jodha 1985). Table 3 does not offer clues in this regard as those groups without a permit yet actually more frequently are based on existing groups than those with a HKm permit. Perhaps existing local bonding social capital serves as a substitute for bridging social capital (i.e., for contacts with Forest Department officials) in these villages. This needs to be discussed further with Watala officials.

The household survey addressed similar questions about membership in other types of groups including labor sharing, water management, credit, religion, and production of coffee, pepper, and livestock. Respondents who are members of HKm groups with a permit more frequently belonged to such other groups than respondents who are not part of HKm group with a permit. This is particularly so for coffee farmer groups, labor sharing groups, water user groups and religious groups. (Very few respondents were active in other kinds of groups.) Interestingly, respondents rarely suggested that there was any direct relationship between these groups and the HKm group. However, the literature on common property resource management has long documented that active groups in one arena can help stimulate collective action in another (e.g. Jodha 1986), so indirect links may be important, even if they were not reported by the survey respondents.⁹

The perceived roles of HKm group leaders (table 4) may also reflect the way in which the program was initiated, although again this cannot be determined definitively with available data.

The leaders of groups with a HKm permit in hand slightly more frequently play the roles of

⁸ This characterization of the Sumendo people was offered repeatedly in interviews during the field work.

⁹ The household data are not presented here since the analysis is still in a preliminary stage. Preliminary tables are available on request.

facilitating group members, giving information to group members, and solving problems. The leaders of more recently formed groups that do not yet have a permit may rely more on outside organizations to play these roles. This may reflect less internal capacity for management and leadership on the part of these groups.

HKm group members are required to pay dues to cover administrative costs and, more importantly, to pay for the cost of preparing the HKm application. Groups also have meetings to discuss various issues. Records from these meetings were examined and percentages of members attending meetings and paying dues were recorded; they are presented in table 5. It is interesting to see that both percentages were higher among the groups that have yet to obtain their HKm permit. This may be because once the permit is in place members feel less need to participate in group activities.

6.3. How well do participants understand the program?

Group leaders in interviews suggest that their members often do not understand the requirements of the HKm agreements. They understand that they are receiving the benefit of more secure tenure, but the idea that they must provide something in return is somewhat elusive. For example, they question the idea that program participants should pay an annual fee, given that the program is supposed to help them.

6.3.1. Program requirements

Interestingly, many group leaders also do not fully understand the program requirements. Group interviews (in which leaders were present) revealed the level of understanding of the program. Table 6 focuses on the requirements of planting a certain number of trees in multistrata coffee plantations, adopting soil conservation practices, and protecting the remaining natural forest area. For all of these requirements, groups that already have HKm permits have a better

understanding of the requirements than those groups still waiting for their permit. Those with a permit more commonly appear to understand the whole package of requirements whereas those without permits are familiar with certain components of the requirements but not others.

One interesting finding concerns the understanding of the requirements for soil and water conservation practices under HKm. As mentioned above, farmers are supposed to build terraces, dig sediment pits, plant along the contour, and retain grass strips. No respondents mentioned either planting along the contour or retaining grass strips, and many of them mentioned planting timber at water sources even though this is not a requirement under the program. Why this is the case is not clear.

Given that even group leaders were not entirely familiar with program regulations, it is not surprising that many respondents in the household survey were even less familiar. In many cases they had never heard of the program even though they were members of HKm groups. In groups with a HKm permit, about 20% of respondents were not aware that they were members; in groups without a permit this was the case for about half the respondents.

This raises obvious questions about program effectiveness. How can the program work if its members don't understand its requirements? This would have to be examined more carefully; for example, we do not know how many respondents follow the requirements but cannot remember the program name.

6.3.2. Program benefits

Respondents often cite their interest in gaining access to a number of government programs, including those for income generation and technical assistance but also services like schools, health centers and transportation. People familiar with the HKm villages suggest that part of the motivation for joining HKm is to join the mainstream of society and no longer be

considered as outlaws who are illegally utilizing restricted land (personal communication with Chip Fay, ICRAF, January 2005). Officially, HKm is meant to bring better access to agricultural and forestry programs, but it should have no impact on other services. However, table 7 shows that many respondents hope that HKm will in fact give them access to other government programs; this is especially so for the groups whose permits have yet to be approved. People expecting access to other government programs are likely to be disappointed and it may be that those who have the permit in place have already realized that such benefits will not be forthcoming.

6.4. Program impacts

The community-level surveys have yielded some initial indicators of program impact, though clearly it is too early in the program to make definitive statements about impact. Nonetheless, some initial indicators are available as presented here.

6.4.1. Land tenure security

In group interviews, respondents indicated their perception of tenure security on protection forest land they cultivate relative to private land. Table 8 shows the perceived security as a percentage of that on private land, which is perceived as 100% secure. The perceptions are presented separately for people in groups that have already obtained HKm permits and those that have not. Pre-1997 was the period of evictions and perceived security of protection forest land was very low, at 11-18% of private land. The *Reformasi* in 1998 brought a large increase in perceived security, but still only at a level ranging from 34-43% of private land. Under current conditions, HKm agreements are believed to sharply raise the security of protection forest land, with a steady increase from the stages of applying for HKm, obtaining the

5-year permit, and obtaining the 25-year permit. Survey respondents perceive that once the 25-year permit is in place, tenure will be nearly as secure as on private land.

6.4.2. Land values

Closely related to the impact on tenure security is that on land values. If tenure is secure, land value should rise due to greater certainty of future income streams. Table 9 reports responses to a line of questioning following the same approach as for perceptions of land tenure security. Respondents reported their perception of change in land values from 1997 (before *Reformasi*, just after evictions), 1998 (just after *Reformasi*), and at present given the land's actual HKm status. Responses from groups with and without HKm are reported separately but they cover the same hypothetical land types.

The subjective land value is heavily influenced by the price of coffee, which is the primary determinant of the land's income potential, as well as by tenure security. The subjective price estimates are given for both land that is already developed for coffee and for shrub land that could be converted to coffee. In both cases, the value of private land peaked after *Reformasi* when coffee prices were very high compared to currently.

For developed coffee land, the perceived value of protection forest land relative to private land was very low (11-13%) during the period before *Reformasi* when evictions had recently occurred. This ratio rose sharply after *reformasi* (18-24% of private land) and it remains identical today for land today that has yet to be approved for HKm. The average ratio increases roughly 10% as the HKm permit is first approved and again when it is extended to 25 years. It is interesting to note, however, that the relative value of HKm land to private land remains less than half even though the perceived differences in tenure security (table 8) nearly disappear. The

reason for this needs to be investigated further; perhaps it is due to quality differences that respondents were considering while responding to this question.¹⁰

Groups with and without HKm permits had differences in perception about price data. Those with HKm permits estimate private land as being much higher in value than those without HKm permits, but those without HKm permits give higher values for protection forest than those with HKm permits. It is not clear why this is so, but three possible reasons are: 1) it reflects differences in the characteristics of the lands that respondents were thinking about while answering these questions; 2) respondents without HKm perceive higher tenure security effects of HKm than those who already have the permit (as shown in table 8), and 3) it is just an artifact of the data and does not reflect any real differences.

On shrub lands, patterns of responses are very similar to those on coffee lands except that the ratio of price between protection forest land and private land is much lower overall. It is not clear why this is so.

6.4.3. Exposure to Corruption

Corruption is a problem throughout the world, but it is particularly common in Indonesia. Transparency International (2005) recently ranked Indonesia the 6th most corrupt country in its study of 102 nations worldwide. World Bank research suggests that corruption hurts poor people the most, substantially draining their incomes (Anderson et al. 2004).

Farmers who illegally cultivate government land are particularly vulnerable to petty harassment by government officials who continue to allow the practice but utilize it as an opportunity for rent-seeking. Respondents reported that they are most commonly subject to the harassment of illegal fees at harvest time when they ship their product to market and government

¹⁰ A survey of biophysical characteristics of 800 plots does in fact suggest that private plots are flatter and have slightly deeper soil than HKm land.

officials wait at road access points and refuse to allow them to pass without paying. However, if land tenure status becomes legalized, farmers may have greater ability to refuse to pay.

Data from the community survey (table 10) show mixed experience with having to pay bribes. Respondents in 22 out of 27 group interviews reported that they had had to pay such bribes at one point or another, but all reported that they are not paying bribes at this time. Most of the seven groups that had never paid bribes credited influential members of their community for refusing to submit to corruption. Of the 22 that did face illegal fees, 9 credited the introduction of HKm for putting an end to the practice, but the remaining 12 cited a variety of other factors. Some said that bribes were only paid when coffee prices were high (just after *Reformasi*); others faced it prior to *Reformasi* during the time of evictions but stated that it ended shortly afterward. Clearly this problem takes local dimensions, which is not surprising, and HKm has contributed to ending it but it is not solely responsible.

6.4.4. Income

Respondents in group interviews almost unanimously indicated that they expect HKm to raise their incomes (table 11). All respondents who said they expect incomes to rise indicated that this is because under HKm they will cultivate more intensively and so will have higher income from coffee as well as additional income from the fruit trees they must plant under HKm. Most give no reason why they would raise intensity, but several stated that increased tenure security will make them feel comfortable in investing more heavily in intensive cultivation, for example using more fertilizer. Most likely the reason for the others is the same – if they were increasing intensity only by requirement most likely they would not anticipate it to result in higher income.

The two groups that did not anticipate higher income from HKm are both participating in another government program called GNRHL, which focuses on reforestation. Also operating through groups, this program offers wages for planting fruit and timber trees in coffee plantations, but many respondents complain that the tree density required by the program is too high (1000/ha as opposed to 400/ha under HKm) and the short term gains from wage employment are more than offset by lower incomes from farming due to the high concentration of trees that do not yield marketable products in the near term. Some respondents indicated that their neighbors want to join GNRHL but do not understand the program's disadvantages. Others have already joined and now regret it. Most likely the two groups that said they do not anticipate income gains from HKm are reflecting their negative experiences with GNRHL.

6.5. Who gains and who loses?

From the standpoint of equitable distribution of benefits, one attractive feature of the HKm program is that it operates in groups rather than individually. As discussed above, many group members had little knowledge of the program or its requirements but benefited from increased tenure security nonetheless. Clearly, the requirement of establishing groups means that in order to benefit from the program, more entrepreneurial, better connected people must bring with them their less capable neighbors and this raises the chances of widespread benefits.

Working in groups, while imposing large transaction costs on group members to organize and monitor members and prepare the application, reduces the transaction costs between the service provider and those who demand the service, whether it is the government or private interests downstream. This makes it more likely that the environmental service agreement can exist at all. In addition, to the extent that hydrological services only can be provided when a certain scale threshold is reached, the group-based mechanism may be inevitable.

As mentioned above, the determinants of gaining access to the HKm program in Sumberjaya include having friends in the Forest Department, which helped some groups gain early access, but also the presence of ICRAF and Watala, which are helping the remaining communities organize. Access to these organizations is important for gaining awareness of the program but also negotiating the application process. The Head of the Forest Department in West Lampung District acknowledged in an interview that the application process remains very difficult and is beyond the capabilities of most villagers. They need the help of skilled people who can make a map of the HKm area and type up a substantive, attractive application. Clearly this means that the gainers from HKm are those who can mobilize such assistance. This constraint has slowed the process of HKm in Sumberjaya and is probably keeping it from making any progress whatsoever in some other areas.

7. Conclusions

Here we offer some preliminary conclusions relative to our first two research questions. We will have more confidence in our conclusions concerning these questions, and related to the other research questions after analysis of the household data is completed.

7.1. Can secure land tenure be utilized as a reward mechanism?

Whether or not tenure security can be utilized as a reward mechanism cannot yet be answered definitively. Household level analysis of HKm's impact on land management will help answer this question, but ultimately more time is needed to assess impacts. Preliminary discussions with many people in Sumberjaya reveal a keen desire for secure land tenure and an appreciation of the idea that they can achieve this by adhering to environmental services agreements. Conversely, they fear being evicted again if they fail to protect forest areas and

engage in sustainable land use practices. On the surface, this suggests that trading tenure security for environmental services is a workable approach.

The reason that more time is needed to assess whether it can work has to do with the nature of tenure security as a reward mechanism. At present, eviction is the only available penalty for people who do not abide by the terms of a HKm agreement, with no intermediate levels of carrots and sticks. Ostrom (1990) discusses the importance of using graduated sanctions in managing common pool natural resources, such that initial transgressions are likely to be penalized but repeated offenses are punished with increasing severity. This helps ensure that punishment is commensurate with the offense, threats are credible, and participants in natural resource management can learn from mistakes while also developing respect for rules. The HKm system has no such intermediate system of punishment for minor offenses.

Given the recent history of eviction and people's strong sense of tenure insecurity, at present the threat of eviction appears to be sufficient to generate adherence to the agreements. The desire to first obtain an initial HKm agreement and second obtain a 25-year extension beyond the initial five-year probationary period is a strong incentive for good behavior. No groups have received the 25-year extension to date. Once such extensions are granted, it is difficult to know whether the threat of eviction will carry as much weight as it does currently, especially if political conditions continue to evolve in such a way that the threat of evicting people from land they have cultivated for many years becomes politically untenable. On the other hand, once groups have planted multi-strata agroforestry systems and invested in soil and water conservation measures, the need for enforcement effort is likely to decline. But the need for continued enforcement of protection of the remaining forest is likely to remain a concern.

One interesting feature of HKm agreements is that punishments for failing to abide by the terms of agreements can take place at two levels. At the official level, punishments are levied against the group as a whole and failure to protect remaining natural forests or watershed functions could result in loss of land tenure for the entire group. Unofficially, however, each HKm group can have its own internal rules and groups can impose individual punishments against members who do not follow rules, thus risking problems for others. Such peer pressure-based systems are familiar in the Grameen Bank and other development programs; they create an incentive for self-enforcement and thus reduce enforcement costs for program officials.

Efforts are underway to adapt the program to account for concerns that the environmental service reward mechanism may lose its effectiveness if the threat of eviction is no longer credible. In August of 2005, the government of West Lampung drafted a decree to initiate a scoring system for assessing progress related to HKm agreements. The scoring system, which has yet to be implemented, would incorporate concerns related to institutional criteria (development of the group to manage the permit area), conservation performance (rehabilitation of barren areas and conservation practices in coffee gardens), and overall impact as measured by various social, economic, and ecological indicators. An assessment team would give each HKm area a score, which would determine whether and for how long the HKm permit is extended, as follows:

<u>Score</u>	<u>Action taken</u>
≤ 35	permit is revoked
36-45	permit extended for one year and then re-evaluated
46-65	permit extended for five years and then re-evaluated
≥ 66	permit is extended for 25 years

It is not yet known how this program works in practice or its effectiveness.

In interviews group members frequently mentioned the desire for access to government services as an important motivation for applying for HKm, even though such services are not included under the program terms. If HKm were adapted to include provision of more government services, they could be utilized as less extreme, more easily applied carrots and sticks in relation to environmental services agreements. One suggestion is to provide HKm groups or villages in the area with annual development budgets against which fines could be levied if environmental service agreements are not adhered to (personal communication with Chip Fay, January 2005).

7.2. Are HKm agreements more common in better connected communities?

Our community survey findings suggest that bridging social capital does play an important role in facilitating access to the HKm program. Access to Forest Department officials, especially the officer who assists with preparation of the map, appears to be particularly important. Other indicators of social capital are also generally greater in communities that have successfully obtained HKm, though the differences are not definitive.

References

- Anderson, James, Daniel Kaufman, and Francesca Recanatini. 2004. Service delivery, poverty and corruption: common threads from diagnostic surveys. World Bank, Washington.
- Ferraro, Paul. 2001. Global Habitat Protection: limitations of development interventions and a role for conservation performance payments. *Conservation Biology* 15(4): 1-12.
- ICRAF. 2002. Rewarding Upland Producers for the Environmental Services they Provide (RUPES). <http://www.worldagroforestry.org/sea/Networks/RUPES/>
- Jodha, N.S. (1986), 'Common Property Resources and the Rural Poor in Dry Regions of India', *Economic and Political Weekly* 30(27), 5 July, pp. 1169-81.
- Krishna, A. (2002). *Active Social Capital: Tracing the Roots of Development and Democracy*. New York: Columbia University Press.
- Landell-Mills, Natasha, and Ina Porras. 2002. Silver bullet or fool's gold? A global review of

- markets for forest environmental services and their impact on the poor. International Institute for Environment and Development, London.
- Ostrom, Elinor. 1990. *Governing the commons: the evolution of institutions for collective action*. Cambridge, England: Cambridge University Press.
- Pagiola, Stefano, Joshua Bishop, and Natasha Landell-Mills, eds. 2002. *Selling Forest Environmental Services: Market-based Mechanisms for Conservation and Development*. London: Earthscan.
- Transparency International. 2005. Corruption Perceptions Index 2005. Transparency International, Berlin, Germany.
- van Noordwijk, Meine, John Poulson, and Polly Erickson. 2004. Quantifying off-site effects of land use change: filters, flows and fallacies. *Agriculture Ecosystems and Environment* 104:19-34.
- Verbist, Bruno, and Gamal Pasya. 2004. Perspektif sejarah status kawasan hutan, konflik dan negosiasi di Sumberjaya, Lampung Barat . Propinsi Lampung. *Agrivita* 26(1):20-28.
- Zbinden, Simon, and David Lee. 2005. Paying for environmental services: an analysis of participation in Costa Rica's PSA Program. *World Development* 33(2): 255-272.

Table 1. Personal relationships that may facilitate HKm, by village¹

	Villages with no HKm group (n=4) ²		Villages with group applying for HKm permit (n=12)		Villages with at least one HKm group with permit (n=5)	
	Percent ³	Mean values ⁴	Percent ³	Mean values ⁴	Percent ³	Mean values ⁴
Forest Department officials live in the village	0	0	25%	0.42	40%	0.8
Villagers have friends in Forest Department	25%	0.25	17%	0.17	60%	0.6
Other government officials live in the village	25%	1.0	42%	0.92	80%	2.2
Villagers have friends in other govt. offices	0%	0	0	0	40%	0.4
Watala ⁵ officials live in the village	0%	0	0	0	0	0
Villagers have friends in Watala ⁵	0%	0	8%	0.08	40%	0.6
Officials of other NGOs live in the village	0%	0	42%	0.67	0	0
Villagers have friends in other NGOs	0%	0	80%	0.08	20%	0.2
Villagers have personal relationship with outsiders who helped form group	n.a.	n.a.	26%	n.a.	50%	n.a.

¹All villages with protection forest only. 7 additional villages have no protection forest so HKm is not applicable.

²Of these four villages respondents in one had never heard of the HKm program

³Indicates the percentage of villages per category with at least one such person

⁴The mean number of such people per village, across all villages (not only those with such contacts)

⁵Watala is an NGO that ICRAF hired to help promote HKm

Source: ICRAF/MSU/IFPRI village survey

Table 2. Other indicators of bridging social capital

Indicator	Groups still applying for HKm permit	Groups with an approved HKm permit
Experienced evictions in the past	22/23	5/6
Mean year the village was established	1957	1960
Mean year the protection forest was first cultivated	1971	1969
Mean concentration of dominant ethnic group	70%	81%
Dominant ethnic group (number of villages ¹)		
Sundanese	10.5	4
Javanese	8.5	2
Sumendo	4	0
Number of motorcycles per group member	0.13	0.19
Mean distance to nearest paved road		
Closest	49	38
Farthest	109	108
Unweighted mean	103	92

¹One village is half Sundanese and half Javanese so the value is one half for each of these groups.

Source: ICRAF/MSU/IFPRI HKm group survey

Table 3. Existing groups as the basis for forming HKm groups

	Groups with application in progress	Groups with a Hkm permit
HKm group is built on an existing group	70%	50%
Type of group built from		
None	30 (7)	50 (3)
Farmer groups	30 (7)	0 (0)
Labor sharing	26 (6)	17 (1)
Religious groups	13 (3)	33 (2)

Source: ICRAF/MSU/IFPRI HKm group survey

Table 4. Perceived responsibilities of group leader, by HKm permit status

	Groups with application in progress ,% and (n)	Groups with a Hkm permit, % and (n)
Facilitate group members	83 (19)	100 (6)
Give members information	61 (14)	100 (6)
Coordinate group activity	57 (13)	50 (2)
Solve problems if any	17 (4)	33 (2)
Empower group members	17 (4)	17 (1)

Source: ICRAF/MSU/IFPRI HKm group survey

Table 5. Percentage¹ of members attending meetings and paying dues

	Groups with application in progress ,%	Groups with a Hkm permit, %
Percent who paid fees	70	65
Percent who attended meetings	77	71

¹Unweighted average percentages from 16 groups with applications in progress and 6 with permits. Data were missing for 6 other groups with applications in progress.

Source: ICRAF/MSU/IFPRI HKm group survey

Table 6. Awareness of responsibilities regarding tree density and composition

Conservation responsibility	HKm applications in progress, % and (n)	HKm permit, % and (n)
Perceived responsibility to protect remaining natural forest		
Jointly protect forest and do not clear forest and shrub land	70 (16)	67 (4)
Jointly protect forest and report illegal logging	26 (6)	33 (2)
Awareness of responsibilities regarding tree density and composition		
Aware of correct number and composition of trees	43 (10)	83 (5)
Not aware of correct number and composition of trees	57 (13)	17 (1)
Awareness of responsibilities regarding soil and water conservation practices ¹		
Mentioned terraces	74 (17)	100% (6)
Mentioned sediment pits	61 (14)	67 (4)
Mentioned planting on the contour and/or grass strips	0(0)	0(0)
Mentioned planting timber at water source	26 (6)	83 (5)

n=23 groups with applications in progress and 6 with permits

¹Actual soil conservation requirements are terraces, sediment pits, planting on the contour, and retaining grass strips. Planting timber at the water source is not required.

Source: ICRAF/MSU/IFPRI HKm group survey

Table 7. Expectation of access to other government programs (percentage of responses)

	Groups still applying for HKm permit	Groups with an approved HKm permit
HKm facilitates access	91 (21)	50 (3)
HKm has no impact	9 (2)	50 (3)

Source: ICRAF/MSU/IFPRI HKm group survey

Table 8. Perceived tenure security on protection forest land as a percentage of the security of private land

Respondent's HKm status	N	Before <i>Reformasi</i> (1997)	After <i>Reformasi</i> (1998)	2005 HKm status (hypothetical)		
				Application in process	5-year permit	25-year permit
Permit obtained	6	18	34	41	68	88
Application in progress	23	11	43	54	77	91

Source: ICRAF/MSU/IFPRI HKm group survey

Table 9. Estimated price of land in protection forest over time and with change in legal status (millions of rupiah per ha)

Estimated by group with:	Coffee land price in protection forest (% of private land price)		Private coffee land price	
	Groups without HKm permit yet	Groups with HKm permit	No HKm permit	HKm permit
	Before Reformasi (1997)	1.77 (13)	1.40 (11)	13.26
After Reformasi (1998)	9.16 (24)	8.63 (18)	37.61	46.67
2005:				
Permit not yet approved	6.43 (24)	5.13 (18)	26.61	29.17
5-year HKm permit in place	8.80 (33)	8.00 (27)		
25-year HKm permit in place	12.02 (45)	10.67 (37)		
	Shrub land in protection forest ¹ (percent of private land price)		Private shrub land ¹	
Before Reformasi (1997)	0.23 (4)	0.34 (7)	5.41	4.92
After Reformasi (1998)	2.37 (11)	1.68 (20)	12.09	15.67
2005:				
Permit not yet approved	1.46 (15)	0.85 (8)	9.93	10.50
5-year HKm permit in place	2.33 (24)	1.46 (14)		
25-year HKm permit in place	3.31 (33)	2.83 (17)		

Estimates are presented separately by groups with & without HKm permits but they cover identical land categories.

¹Shrub land is suitable for coffee but not yet developed.

Source: ICRAF/MSU/IFPRI HKm group survey

Table 10. Number of villages that encountered corruption and the role of HKm in ending it

	No HKm permit, % and (n)	HKm permit, % and (n)
Never had to pay bribes	26% (6)	17% (1)
No longer have to pay bribes	74% (17)	83% (5)
Why no longer have to pay?		
No longer demanded	18% (3)	40% (2)
No longer demanded after reformasi	29% (5)	40% (2)
Stopped as soon as HKm group formed	47% (8)	20% (1)
Stopped because of village leader's actions	6% (1)	0% (0)

Source: ICRAF/MSU/IFPRI HKm group survey

Table 11. Expected impacts of Hkm on income (percentage of responses)

Group	N	% who expect income to increase	% who expect no change in income	% who expect income to decline
Hkm permit	6	100	0	0
Hkm in progress	21	91	4.5	4.5

Source: ICRAF/MSU/IFPRI HKm group survey