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Moving Towards Company-Community Partnerships

Elements to take into account for Fast-Wood Plantation Companies in Indonesia

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Abbreviations and acronyms

AA	Arara Abadi—Plantation Company associated with IKPP and APP Group
APP	Asia Pulp and Paper
APRIL	Asia Pacific Resources International Holdings
BHKP	Short-fiber beech hardwood kraft pulp (in the Nordic countries, birch pulp)
BPS	Badan Pusat Statistik
C-C	Company-Community
CD	Community Development
HTI	Hutan Tanaman Industri (Industrial Timber Plantation)
HTPK	Hutan Tanaman Pola Kemitraan (Joint Venture Forest Plantations, WKS)
IIR	Inti Indo Rayon—Plantation Company associated with TPL pulp mill and the RAPP Group (up to 2002)
IKPP	Indah Kiat Pulp and Paper
MHBM	Mengelola Hutan Bersama Masyarakat (Managing Forest with the Community, MHP)
MHP	Musi Hutan Persada—Plantation Company associated with TEL mill and Barito Pacific Group
NGO	non-governmental organization
PDM	Pebble Distribution Method
PIR	Perkebunan Inti Rakyat (Nucleus People Estates, IIR)
PMDH	Pembinaan Masyarakat Desa Hutan (Rural Forest Community Development, WKS)
PT	Perseroan Terbatas (= limited company)
RAPP	Riau Andalan Pulp and Paper Group
SMG	Sinar Mas Group
tonne	metric ton (1000 kg)
TEL	Tanjung Enim Lestari mill
TPL	Toba Pulp Lestari Pulp Mill
WKS	Wira Karya Sakti—Plantation Company associated with Lontar Papyrus mill and APP Group

Glossary

adat	traditional, customary
Batak	indigenous group very important in North Sumatra
conversion forest	Indonesian categorisation of forests that are subject to clear cutting. Areas with forest cover that can be converted to agriculture or other purposes that require a total conversion of the present land use
harvest	extraction of products from plantations
hukum	law
hukum adat	Indonesian customary (traditional) law (from *hukum* + *adat*)
Joint Venture scheme	a scheme involving landholders (providing land or forest, land or forest management, or both) and industrial processors or government (providing initial capital/finance, management and market opportunities). Lease payments (e.g. annual payments as land/forest rent) or profits are calculated and shared proportionally among partners according to their inputs (including risk carried) and market price at harvest. Profits may not necessarily be taken as a financial return, but alternatively as a share of the forest product or in indirect benefits (e.g. roads, schools, health centre) (IIED 1999)
jungle rubber	a term that refers to rubber trees (*Hevea brasiliensis*) planted as enrichment on fallow land
Kepala Desa	administrative head of a village
Kepala Dusun	administrative head of a sub-village
land under conflict	concession land over which there is dispute with local people concerning ownership and use—the concessionaire companies cannot freely carry out work (including logging, harvesting and planting) there
logged-over forest	forested areas that have previously been logged
marga	means 'indigenous group' (South Sumatra)
opportunity cost	the cost of a resource 'X' calculated at the best alternative use of that resource. It actually represents the minimum amount of money that a given agent will be willing to accept for the resource, and therefore is a measure of the value of the resource
out-grower scheme	A scheme involving growers contracted to supply the raw forest material for processing companies (at a set price or at the market price at harvest), with growers responsible for the silviculture and maintenance. Growers may act individually as land/forest owners, as a group of individual land/forest owners or as a group with communal land/forests. The government may also act as a contracted grower, supplying products from public land or forests (e.g. providing 'concessions' or 'harvesting rights' to processors) (IIED 1999)
partnerships	relationships and agreements that are actively entered into by two or more parties, on the expectation of receiving benefits (Mayers and Vermeulen 2002)
Reformasi	democratisation period initiated after 1998 in Indonesia
tanaman kehidupan	plantations for livelihoods
tanaman unggulan lokal	local people's plantations
use category	each of the 'n' categories among which forest, natural products, and services used by locals can be categorised according to their use

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Executive Summary

Tree plantations developed on public lands can be associated with conflicts for control over the natural resources among different groups or agents. Conflicts between local or indigenous communities and private concessionaires or governments are mainly due to overlapping rights to the land. In Indonesia, tree plantation companies have gained concession rights for up to 300 000 ha of land each, for its conversion to tree plantations, through Industrial Timber Plantation (HTI) permits. Trying to minimise the area of land under conflict, associated with overlapping land management interests in the concessions, is a major concern for tree plantation companies in Indonesia.

Two kinds of approaches have been used to target local communities associated with land under conflict in concession areas: direct investments in cash benefits, infrastructure or agricultural projects under the umbrella of Community Development (CD), and the involvement of communities as partners, where the company shares the profits of the harvest with the community.

To successfully target community or private lands in concession areas with Company-Community (C-C) schemes, the companies must offer a monetary amount that represents higher benefits for the people than the current benefits that the land is providing, taking into account the frequency of the benefits. Companies are not taking full account of the current value of the land for the people when formulating the financial aspects and frequency of returns of such schemes; indeed, the terms of the schemes currently offered have been mainly dictated by the companies' operational costs.

This document focuses on: (1) testing the effects of CD expenditure on the area of land under conflict using an econometric regression; and (2) estimating the value of areas managed by locals to find the minimum amount of money that should be offered in the partnership schemes.

The study took place on the island of Sumatra, Indonesia, where some of the largest mills account for nearly 75% of the country's installed capacity for pulp production. We have included in the analysis four of the five largest pulp-purpose tree plantation companies associated with such mills, namely Musi Hutan Persada in South Sumatra associated with Tanjung Enim Lestari Pulp mill (Barito Pacific group); Wira Karya Sakti in Jambi, associated with Lontar Papyrus pulp and paper mill (Asia Pulp and Paper [APP] group); Arara Abadi in Riau associated with Indah Kiat pulp and paper mill (APP group); and, Inti Indo Rayon in North Sumatra, associated with Toba Pulp Lestari pulp and rayon mill.

To analyse the influence of the CD investments on the area of land under conflict, we used the following linear regression model:

$$LC_{k,i} = \beta_0 + \beta_1 CD_{k,i} + \varepsilon_i$$

Where LC represents the area of land (ha) under conflict (present claims at time of study, 2003); the sub-indices k and i represent each of the districts and plantation companies, respectively; β_0 and β_1 are the intercept and the parameter of the variable (slope), respectively; CD is the total amount of money (US$) spent on CD programmes to date; and, ε represents the probabilistic error of the function.

For the valuation of the areas, we gathered primary data in August–November 2003, spending two to three weeks in each of the locations. The fieldwork was conducted in or near the HTI concession areas of each of the plantation companies, including the sub-villages or settlements of Talang Belanti in South Sumatra; Bagan Tengah in Jambi; Kuntu Toeroba and Jiat Kramat in Riau; and Lumban Purba in North Sumatra.

We interviewed 26-30 households per village, including men and women in similar proportions to capture both perspectives of knowledge. One person was interviewed per house visited. The interviews were conducted during early mornings and late afternoons, using the day period in between to accompany the villagers to the areas where they manage or harvest natural resources.

The total amount of money invested in CD has had a statistically positive effect on the area of land under conflict (area affected by claims): districts with higher CD expenses showed larger areas of land affected by claims today (2003). Thus, CD investments seem to promote land claims instead of reducing them. The regression showed that every US$400 invested in CD resulted in one additional hectare of land under claim.

In addition, we would expect to observe over 2000 ha of land affected by claims in each distric, holding HTI concessions, even if the CD expenses were zero—the size of the area under conflict is therefore also influenced by other factors not included in the model.

About 58% of the variation in the area under claim is explained by the changes, or variations, in CD investments. The model is a relatively good fit, although there are additional elements explaining the size of the area of land affected by claims.

Logged-over areas are important for people's livelihoods; we obtained information on a total of 307 products important for the people in seven use categories. Nevertheless, no resource was mentioned as being critical for these villagers, and market substitutes are found for most of them.

The average value of the land-use per hectare per year for each village studied, comprising the two different landscape units managed by the villagers—the agricultural fields (*ladang*) and forested areas (*kebun*)—, ranges from US$350 to US$730 dollars/year, representing US$630-1400 dollars per household per year. The wide ranges reflect the diversity of systems: while in some locations the villagers had small areas managed more intensively for agriculture, showing a high value per hectare but low value per household, other locations had large forested areas with low value per hectare but high value per household.

The positive influence of CD investments on the size of the area affected by claims can be explained by the fact that large amounts of money are spent in small villages. This leaves the way open for people to obtain financial benefits by generating conflicts over the land. Additionally, infrastructure development (social, educational, roads, etc.) is a strong component of the CD programmes, encouraging people that had left their villages (looking for a better life) to return to their villages or forested areas. These investments generate the required incentive for them to claim their rights over lands (previously abandoned) falling under concessions.

Furthermore, some expenditure lines are too loose to explain how the money is being spent, leaving a gap for money that benefits one or a few members of the community, generating the possibility for spending the money while not solving the land conflict issue for the community and creating the chance for further conflict.

While this result does not support the reduction or elimination of the CD expenses, the companies do need to try to better understand the reasons and motivations for the claims in the HTI areas and how to invest in CD in a way that can be beneficial for both the companies and the communities. In-depth analysis at the company level will be required to assess the reasons for encountering larger areas affected by claims where more money has been spent. Our findings highlight the need for a proper rethink of the way CD money is spent.

By showing how important particular resources are for the people and where they obtain them from, we can help in improving a company's understanding about the importance of the land and its resources for the people in the HTI areas. This information is critical in developing a successful C-C scheme that takes into account the importance that people give to different areas and resources.

The value of land in the HTI areas to the villagers ranged from US$350 to US$700 per hectare per year for the five sites studied. These values are considerably higher than the benefits people obtain from planting trees for pulp. Although no comparisons of offered and calculated land use values for the specific locations can be made, the large differences between them for a given concession area may explain why the companies are encountering very low acceptance for their partnership agreements and almost none has gone further than one rotation period (seven years).

It is important to underline that the values calculated represent the value of the areas in the specific villages included in the study and will not be representative of the entire HTI concession area of each company. The methodology used here, based on people's perception, could be useful for calculating the amount of money that should be offered in agreements, because it takes into account what the people are obtaining from the specific areas and their own valuation of that. However, the results would not necessarily be representative of a different area and different people. These values can be used as an estimate to compare or as a value for the areas in the study, but the companies should calculate the value of new areas to be included in agreements.

Our field observations confirmed that villagers, thanks to their knowledge and skills, rely almost entirely on local logged-over ecosystems (natural or anthropogenic) for their livelihoods. No former study has shown the diversity of products obtained from these areas, or determined their relative importance for the people. These are areas that companies have previously considered of almost no value to the local communities.

The companies need to estimate the value of concession areas for the local people if they want to target a improved and long-term acceptance of their C-C agreements.

INTRODUCTION

Addressing social issues and developing social relations with local people or communities is becoming increasingly important for tree-plantation companies in Indonesia and around the world. Social problems can be financially costly to the companies through reductions in the area of land available for planting; obstruction of operations; damage to plantations; transaction costs, and costs associated with bad reputation.

Tree plantations have been encouraged as a way to produce forest products and avoid deforestation. The total area of tree plantations globally has increased from nearly 40 million ha in 1980 to more than 80 million ha in 1995 and then more than doubled its size in the following five years to reach nearly 187 million ha in 2000 (FAO 1997, 2003a).

Although the vast majority of the tree plantations are considered to be private, their development has also taken place on public lands. No data are available for land ownership, but 'plantation ownership' is reported as 33% public, 26% private and 41% unspecified (FAO 2001).

Tree plantations developed on public land can be associated with conflicts for control over the natural resources among different groups or agents. Conflicts between local or indigenous communities and private concessionaires or governments are mainly due to overlapping rights (though not necessarily legal rights) over the land. Concession rights for the development of tree plantations, as well as other land use rights (such as reconnaissance permits for mining or logging concessions on State lands), have led to conflicts in (among others) Brazil (Borges 1996); Canada (UoA 1997); Guyana (FPP 1994, 1999); Indonesia (Suyanto *et al*. 2000, 2004; WALHI 2003); Sabah and Sarawak in Malaysia (Wong 2001); South Africa and Zimbabwe (Mulenga 2000).

Land conflicts in Indonesia arise from the fact that the indigenous or community rights are recognised but not always respected. Communities that have been occupying and managing State land for generations have 'use rights'—recognition based on customary (*adat*) law—over those areas. Although adat rights were recognized by the Indonesian customary law (*hukum adat*) in the 1999 Forestry Act and in other pieces of legislation, adat land rights are not actually observed in forest areas, because these are still categorised as State-owned—this leads to controversies and conflicts.

Trying to minimise the area of land under conflict associated with overlapping land management interests in the concessions is now a major concern for plantation companies in Indonesia. So far, two kinds of approach have been used to target local communities associated with land under conflict in their concession areas.

The approaches include direct cash benefits, infrastructure or agricultural projects under the umbrella of Community Development (CD) aspects required by law (Forest Management Act No. 5/1967; GR 7/1990; Basic Forest Law No. 41/1999; GR 34/2002)[1] and the involvement of communities as partners in the development of the tree plantations.

The CD expenditure represents a large amount of money, which varies from company to company and from case to case (Table 1). Although there is a general perception among the plantation companies that CD investments may generate a 'positive' image of the company and improve their relationships with local communities, it is not clear whether such investments have had a direct effect on reducing the amount of land under conflict for the companies.

On the other hand, in the partnership agreements with the communities, the company manages the land under conflict and shares the profits of the harvest, also offering labour opportunities during the development of the plantations. Profits are calculated from income minus the company's operational costs, they do not take into account the value of the land (which the community is effectively donating to the system). The main reason behind this

[1] The obligations of HTI holders between 1990 and 2002 in CD aspects included, among others: supporting the area's development, regional development and the development of the welfare and economy of the communities living around the working area; allocating 20% of the company's shares to the local community cooperatives, as a form of community compensation; setting aside 20% of the company's profits for the supervision and development of Village Unit Cooperatives (KUD) and for those who were economically deprived; and, assisting the government in building religious, education and health facilities (WALHI 2003).

Table 1. Characteristics of the four plantation companies included in the study

	Musi Hutan Persada	Wira Karya Sakti	Arara Abadi	Inti Indo Rayon
Location (Province)	South Sumatra	Jambi	Riau	North Sumatra
Year of concession	1996	1996	1996	1984, 1992, 1994
Original land coverage (species)	grass, bush + log-over	logged-over forests	logged-over forests	pines + log-over forests
CD expensesa (US$ '000)	1527	401	2222	274
Concession area (ha)	296,400	203,449	299,975	284,060
Planted area (ha)	193,500	96,018	148,346	46,000
Land claimsb (ha)	26,620	15,000	36,443	4000

Sources: DEPHUT (2003) and companies' data.

is that concessions have granted companies the legal rights on the land. The partnership agreement strategies are similar for all the companies, offering a share (40% for the partner communities) in the profits or products. Although companies see these agreements as a feasible way of handling and reducing the areas under conflict, they have acknowledged encountering low acceptance and finding it difficult to maintain the agreements beyond one rotation period.

This document focuses on: (1) testing the effects of CD expenditure on the area of land under conflict using an econometric regression; and, (2) estimating the value of areas managed by locals to determine the minimum amount of money that should be offered in the partnership schemes.

The first should demonstrate the significance of the CD expenditures on the incidence of land conflicts and may be a tool in the decision-making process for the companies. The second (obtained land value) could be used to help reduce land conflicts and ensure long-term adoption of the partnerships if used by the companies and communities as the bottom price to be offered/received for land conversion to tree plantations in the areas.

Vegetable cultivation developed by farmers with Company support (*Photo by Philippe Guizol*)

Introduction to the Area of Study

In the late 1980s, Indonesia invested heavily in the development of the country's pulp industry. The total pulp production capacity in Indonesia rose from 515 000 tonnes/year in 1987 to 3.9 million tonnes/year by 1997 (Barr 2001). Total pulp-for-paper production in Indonesia in 2002 was nearly 5.6 million tonnes (FAO 2003b).

To secure a good supply of fibre for the newly developed pulp mills, large areas of State-owned forestlands have been allocated through Industrial Timber Plantation (HTI) permits since 1984[2], to promote the development of industrial tree plantations in the country. A total area of 5.38 million ha had been allocated through HTI permits up to 2002 (DEPHUT 2003), with approximately 41% of this area concentrated in Sumatra.

The land available for HTI development initially corresponded to 'production forest that is not productive' and prioritised vacant lands, pastures, bush and other unproductive forests. In 1990, HTI development was permitted into 'regular production forest' areas considered to be unproductive, i.e. with a productivity rate of below 20 m^3/ha of commercial species with a diameter of 30 cm (Barr 2001), only 2 m^3 below the norm for tropical forests (Marchack 1995; WALHI 2003). Such areas, legally categorised as conversion forests[3], represent approximately 14 million ha of forest land (MoF 2003).

Pulp mills can use almost any wood over 10 cm in diameter to produce pulp for paper and related products. The HTI permits allow the concessionaires to clear-cut the allocated areas (up to 300 000 ha) and to use that wood to supply the early years of their operations. The agreements are usually signed for long periods (42 years for concessions before 1999 and 100 years for those after 1999) and the plantation companies are expected to plant tree species that will meet their mill requirements on a sustainable basis.

Jungle rubber (*Hevea brasiliensis*) in HTI concession areas (*Photo by Philippe Guizol*)

[2] Forestry Ministerial Decrees No. 20/Kpts-II/1983; No. 320/Kpts-II/1986; No. 471/Kpts-II/1989; Government Regulation No. 7/1990.

[3] Conversion forest is subject to clear cutting and can be used for agriculture and other purposes that require a total conversion of the present land use.

Rubber extracted from the forests in HTI concession areas in Jambi (*Photo by Philippe Guizo*l)

As mentioned above, these large areas, legally considered State land, often overlap with villages and indigenous community lands. Such areas may contain rubber tree (*Hevea brasiliensis*) plantations, cash-crop or coffee plantations (mainly in North Sumatra); significant proportions of commercially valuable timber (Kartodihardjo and Supriono 2000); or jungle rubber[4] managed by the locals. This then results in the overlapping of interests and the emergence of conflict over the areas.

Problems with the new (HTI) land use and local rights became visible only after 1998 with the fall of former president Soeharto. Under Soeharto's regime, people were not allowed to openly protest or claim. After 1998, a period of democratisation known as Reformasi included legal reforms supporting greater participation of local communities in forest management (Basic Forestry Law 41/1999, Article 4) along with the implementation of the policy on decentralisation and devolution (Law 22/1999 on Local Governments, and Law 25/1999 on Fiscal Balance). These changes in the transition from an authoritarian to a democratic regime were accompanied by reduced law enforcement, which allowed the people the 'freedom' to protest. Communities and villagers, sometimes supported by NGOs and other associations, began to protest and to fight for what they considered their lands.

Problems became evident in the large areas of land allocated for industrial plantation development. People began to complain to local governments asking for compensation for or return of the lands given in concession; they openly protested and obstructed companies' operations by blocking access to main roads, setting fire to the plantations or lumber yards, or simply refusing to leave the areas they had laid claim to (Suyanto *et al*. 2000; companies personal communications).

The concession areas under conflict are of major concern for the plantation companies because they can be costly for the sister pulp mills[5] if the continuity of wood supply is affected. Each 5 ha of land not harvested

[4] Jungle rubber (*Hevea brasiliensis*) refers to rubber trees planted as enrichment in fallows.

[5] Sister pulp mills refer to those owned by the same company group in the integrated chain of production.

represents around US$38 000 gross profits lost by the sister mill[6]. Pulp mills cannot afford a reduction in operations and must run on a continuous basis with only short recesses for repairs and maintenance of machinery and equipment. The high fixed costs associated with debt re-payments[7] force the companies to keep the mills running continuously. Interest costs of Indonesian pulp mills are estimated to be around US$100 per tonne of pulp (Sachs 1998).

Current Dynamics

The plantation companies have left aside between 3% and 9% of their concession areas as areas falling under local people's management (*tanaman kehidupan or tanaman unggulan lokal*) (companies' data). They have targeted local communities for their CD programme and partnership schemes in an effort to reduce the area of land under conflict, but with limited success.

Although insufficient promotion, poor company image and reputation are also certainly to blame for the poor adoption of the companies' schemes, the most important is that the villagers perceive the financial benefits as being inadequate. Such schemes are therefore deemed not worth undertaking. Villagers are also sceptical of the long period before benefits are received. Currently, companies do not take full account of the value of the land when formulating the financial aspects and frequency of returns of such schemes—the terms of the schemes currently offered have been mainly dictated by the companies' operational costs.

To successfully target community or private lands in the concession area with Company-

Patch of forest in HTI concession claimed by local villagers (*Photo by Julia Maturana*)

[6] Based on an average wood production of 200 m^3 of wood/ha; an average requirement of 4.5 m^3 of wood to produce 1 tonne of pulp; a selling price of US$560/tonne of BHKP and a gross profit margin of 30%. Pulp price is based on the Asia Pulp and Paper (APP 2002) quotation of Asian Graphic Paper Forecast (RISI) price for 2003. The profit margin was obtained from Sachs (1998) profit model for Indonesian Pulp and Paper sector.

[7] The current APP debt amounts US$13.9 billion (Jones 2003).

Community (C-C) schemes, the companies must take into account the opportunity cost[8] of the land and offer an amount that represents higher benefits for the people than the current benefits the land is providing, taking into account the frequency of the benefits.

The following sections of this report elaborate the approach used; give insights into each of the five case studies in the analysis; detail the methods used for data collection and analysis; present the characteristics of each of the fieldwork sites; show the two kinds of results and discuss the relevance of these results to conclude with some recommendations.

[8] The opportunity cost, in strict economic terms, represents the cost of a resource X calculated for the best alternative use of it. It actually represents the minimum amount that a given agent will be willing to accept for the resource, and therefore is a measure of the value of the resource.

SCOPE OF THE STUDY

Little work has been done to measure the value of the areas converted into pulpwood plantations. Recent CIFOR research (Nawir *et al.* 2003) remarked on the importance of accounting the global value of the areas under C-C agreements as a way to ensure scheme sustainability. The difficulty of valuing community land lies in the non-existence of a market for such lands and the wide range of products and services important for local livelihoods. The areas managed by locals are a constant source of food, construction material, medicine, and other products and services, which are important as sources of income or income substitution. The absence of an observable market price reflecting the value of the areas results in the companies underestimating the value of the land resource in their agreements.

By considering only the most obvious resources, e.g. rubber trees, companies omit many other forest uses and resources. Even though these resources might not be important in monetary terms or may be difficult to price, they might turn out to be very important for the local livelihoods. This then results in conflict and difficulties when trying to reach agreements involving land use changes. A proper valuation of both parties' inputs, including the consideration of non-monetary inputs, is critical when developing partnership agreements for long-term viability (FAO 2002).

The opportunity costs for the community land, for use in C-C agreements, must value the range of products and services of the areas. These must then be represented by objective, reliable and comparable figures to be used in the schemes. Thus, we estimated the opportunity costs by assessing the value and importance of the land and resources for local communities in HTI concession areas. In this context, the value of the land includes the full range of goods, commodities and services that these areas provide to the locals.

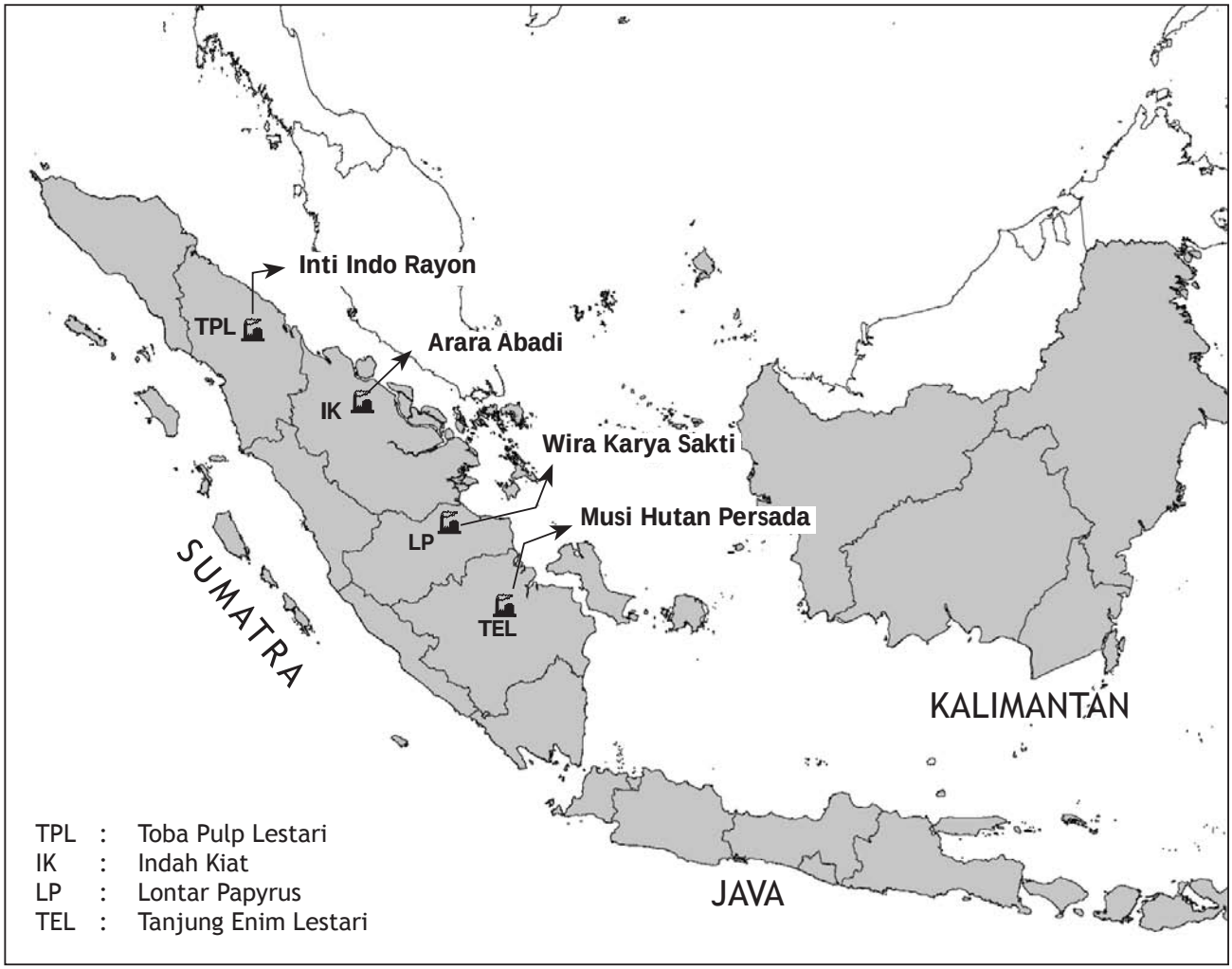
CASE STUDIES

This study took place on the island of Sumatra, Indonesia, where some of the largest mills account for nearly 75% of the country's total installed capacity for pulp production (Barr 2001). The analysis includes four of the five largest pulp-plantation companies associated with such mills (Fig. 1). The plantation companies included are:

- Musi Hutan Persada in South Sumatra, associated with Tanjung Enim Lestari Pulp mill (Barito Pacific group)
- Wira Karya Sakti in Jambi, associated with Lontar Papyrus pulp and paper mill (Asia Pulp and Paper [APP] group)
- Arara Abadi in Riau, associated with Indah Kiat pulp and paper mill (APP group)
- Inti Indo Rayon in North Sumatra, associated with Toba Pulp Lestari (formerly Indorayon) pulp and rayon mill (62% owned by APRIL group until 2002).

The main considerations when choosing the study cases were: presence of land under conflict in the concession areas; areas under conflict targeted through similar approaches, i.e. with CD expenditure; similar size of areas in concession; similar concession periods; and, willingness to participate in the study. The main similarities and differences are detailed in Table 1, while important specific characteristics are given below.

Figure 1. Location of the four pulp-plantation companies included in the study



Musi Hutan Persada (MHP)

The Musi Hutan Persada (MHP) plantation company obtained its concession rights over a total area of 296 400 ha of land covering nearly 50% grasslands and bush and 50% logged-over forests. The first plantation trials were planted in 1991, though the formal concession rights were obtained only in 1996, when the total area planted had reached over 160 000 ha.

The concession area is distributed over five districts with over 50% of the total area concentrated in the district of Muara Enim. The total area affected by claims to date is 125 000 ha, nearly 40% of the concession area. Current (2003) unsettled claims cover nearly 27 000 ha of land.

Communities are targeted offering the claimers operational, management and production fees under a scheme called 'Managing Forests with the Community' or MHBM (*Mengelola Hutan Bersama Masyarakat*). Under this scheme, the company has the right to manage the claimed area and the community receives about US$0.29 per m^3 of the harvested[9] wood at the end of the rotation period. Operational and management fees are offered during the first 2-3 years of operations related to the plantation development. One case has been solved giving a compensation of US$39/ha to an indigenous group (marga) for an area of over 12 000 ha that will be managed under the MHBM scheme.

In addition, the company offers possibilities for agricultural investment for the people, invests in social infrastructure, and provides cash for scholarships and other types of support for the communities. Such investments began in 1991 under the CD programme, targeting communities in or near the concession areas. The amount spent in CD programmes was not recorded during the early years, but CD staff provided estimated totals for the periods reported (Table 2). The only detailed expenditure corresponds to 2002 for a total of nearly US$540 000 (Table 2).

Wira Karya Sakti (WKS)

The Wira Karya Sakti (WKS) plantation company initiated operations in 1990 over a total concession area of 203 449 ha. The formal rights were obtained in 1996. The area was catalogued as logged-over forests distributed over four districts, with over 60% of the total area allocated in the district of Tanjung Jabung Barat. Almost 70% of the area corresponds to peat swamp, where the main economic activity for locals is logging for the local saw mills. The average wood production in WKS peat swamp forests is estimated at 150 m^3/ha, representing an income for illegal loggers in these areas of between US$175 and US$292 per month (AMEC 2001), generating strong pressure on the remaining forests[10].

Over the dryland areas, the locals' main land use corresponds to jungle rubber (estimated to have covered about 1 million ha in the late 1980s; Chomitz and Griffiths 1996), rubber plantations, and oil-palm plantations (estimated to exceed 250 000 ha; Griffiths and Fairhurst 2003), of which approximately 34% is believed to be managed by smallholders (Potter and Lee 1998).

WKS has cleared over 96 000 ha of previously logged forest for the establishment of *Acacia* spp. plantations, and kept some 70 000 ha under people's forests and croplands (WKS 2003). The reported total area affected by land claims is nearly 40 000 ha, while unsettled land claims affected nearly 15 000 ha in the

Table 2. Estimated amount (US$) spent in MHP Community Development programme per year

Expenditure line	1990-1998*	1999-2001*	2002
Agricultural trials			39,237.8
Help for people			30,888.2
Education			20,904.2
Community support			52,721.7
Infrastructure			392,311.6
Total	*652,533*	*113,047*	*536,063.5*

* Figures for 1990-1998 and 1999-2001 are MHP estimations (no records available).

[9] The term 'harvested' refers to planted trees, while the term 'logged' refers to natural forests.

[10] The average wage for Indonesian production workers in 2000 was about US$47/month (BPS 2003).

districts of Tanjung Jabung Barat and Timur (in 2003).

The scheme offered to the people claiming concession areas, called 'Joint Venture Forest Plantations' or HTPK (Hutan Tanaman Pola Kemitraan), offers a 40% share of the profits made from acacia wood sold to the associated Lontar Papyrus mill at the end of the seven-year rotation. The current estimation[11] of the share received by the people involved in this scheme is US$62/ha per year.

Like MHP, WKS invests money in other non-regular expenses targeting the surrounding communities with the 'Rural Forest Community Development' or PMDH (*Pembinaan Masyarakat Desa Hutan*) programme. The PMDH expenditures have been recorded since 1998 and represent an average of about US$80 000 per year (see Table 3).

Arara Abadi (AA)

The Arara Abadi (AA) company, a subsidiary of Indah Kiat Pulp and Paper (IKPP) mill, initiated operations in 1990 (the mill itself has been functioning since 1984). Before the plantation company was formally created, the mill handled the logging through an internally managed forestry division over a 40 000 ha concession. The formal concession was given an area of 299 975 ha in 1996. The concession area, distributed over seven districts with 72% in the districts of Siak and Pelalawan, was catalogued as logged-over forest where about 60% is considered to be peat swamp with an average wood production of more than 150 m^3/ha (AA personal communication).

The total area affected by land claims totals over 80 000 ha, with a remaining current area under claim (2003) of about 37 000 ha affecting nearly 30% of the 'feasible to plant' area of the concession. The 'feasible to plant' area being that not included under settlements, infrastructure, conservation area, buffer zone and areas managed for non-pulp tree species. The company has been handling the land claim issue using a similar scheme to that used by the related[12] WKS, but has been less successful.

Arara Abadi initiated its CD programme in 1995 and has an average expenditure of about US$1.2 million/year (see Table 4 for details).

Inti Indo Rayon (IIR)

A total area of 284 060 ha was conceded through three permits in 1984, 1992 and 1994 to the Inti Indo Rayon (IIR) plantation company in the province of North Sumatra. IIR initiated operations in 1988 to supply the related pulp mill Indorayon (now called Toba Pulp Lestari). The mill had an average demand of 180 000 tonnes of pulp per year until 1993, when it increased through mill expansion to 240 000 tonnes of pulp per year. These production capacities required a constant supply of about 800 000 m^3 and 1 million m^3 of wood, respectively[13]. That meant a monthly clearance of over 700 ha of land[14] until 1993 and post-1993 clearances of close to 1000 ha per month until their own plantations were ready to harvest in 1995.

Concession areas are distributed over five districts, with nearly 50% of the area concentrated in the district of Tapanuli Utara. The areas contained pines planted by the people through reforestation programmes in the early

Table 3. Recorded amount (US$) spent in WKS Community Development (PMDH) programme per year

Expenditure line	1998	1999	2000	2001	2002
Education, training, religious and social expenses	16,936.4	36,849.2	39,599.6	41,617.6	50,695.8
Social and religious-related infrastructure	56,623.7	62,635.1	28,860.2	33,093.1	34,193.3
Agriculture, agroforestry and conservation	4.49	0	262.7	194.91	0
Total	*73,564.6*	*99,484.3*	*68,722.5*	*74,905.61*	*84,889.1*

[11] This estimation is based on information provided by the company with respect to the current price per tonne received by HTPK participants, using an estimated yield of 182 tonnes/ha.

[12] Both plantation companies are under the same Asia Pulp and Paper (APP) management group.

[13] Using a conversion rate of 4.5 m^3 of wood for each tonne of pulp.

[14] Assuming an average wood production of 91.5 m^3/ha, which is the estimated standing stock for Sumatran logged-over forests, including all species with a diameter of 10 cm and above (Simangunsong 2003).

1980s (30%), secondary forest of mixed tropical hardwoods (68%) and grassland (2%).

The current (2003) area claimed by local people was reported to be less than 4000 ha, a very small area compared to the other plantation companies. Although the constant logging of the area probably had a major effect on the surrounding communities, this did not lead to any 'observed' social problems because most of the logging took place before 1998, i.e. when protests were illegal in Indonesia.

Since then, however, problems have arisen and the mill has faced a number of social difficulties, including riots and other demonstrations. This situation ended up with the Government decision to close the mill in 1999. The mill resumed operations in early 2003 under a new name. The related plantation company is now in a very delicate situation regarding social pressures in handling the community. The plantation company is dealing with the communities in a situation where the local and central governments observe and influence the C-C agreements and the company's 'goodwill' in handling social problems (TPL personal communication). The local government decides the price to be paid to the people participating in the joint scheme called 'Nucleus People Estates' or PIR (Perkebunan Inti Rakyat).

About 120 000 ha of land (45% of the total area) is covered by local species planted by local people for their livelihoods or else allocated to villages, settlements or agricultural fields. Areas allocated for conservation and infrastructure represent 32% of the area, and the remainder (totalling only 63 000 ha, 23% of the total area) is for plantation development (TPL 2002).

The CD programme began in 1995 and has an average expenditure of US$53 000 per year (see Table 5).

Farmer participating in the PIR joint scheme with IIR (*Photo by Julia Maturana*)

Table 4. Recorded amount (US$) spent in AA Community Development programme per year

Expenditure line	1995	1996	1997	1998	1999	2000	2001	2002
Roads	10,673.3	5,182,329.3	1,669,084.1	74,568.6	333,447.5	697,335.6	2,861.8	259,794
Religious	3,030.8	33,479.1	16,879.9	4,306.2	7,810.2	27,322.7	17,288.3	61,501.8
Education	15,122.6	1,707.7	14,264.2	1,777.6	25,718.1	17,305.2	28,039.2	86,579
Agriculture	27,797.5	43,720.1	80,481.4	24,359.3	83,728.5	19,568.7	24,094.6	157,662
Ceremonies	0	0	0	0	2,834.7	11,433.6	389.8	0
Training	0	0	0	49.9	2,502.8	6,934.4	97.5	3,905.6
Infrastructure	3,626.3	10,032.9	3,966.5	59.9	5,308.6	9,443.5	6,870.3	29,610.7
Sports	0	11,722.7	412.4	2,574.5	4,011.4	4,586.3	5,280.0	113,977
Others	0	2,583.9	0	998.6	18,685.8	21,612.5	3,502.1	12,068.9
Total	*60,250.5*	*5,285,575.7*	*1,785.088,5*	*108,694.6*	*484,047.6*	*815,542.5*	*88,423.6*	*725,099*

Table 5. Recorded amount (US$) spent in TPL Community Development programme per year

Expenditure line	1995	1996	1997	1998	1999	2000	2001	2002*
Agriculture	2,232.0	4,227.5	0	0	0	0	0	0
Economic support	8,191.3	18,078.8	66,598	4,669.7	13,748.6	13,128.7	3,601	0
Infrastructure	12,331.7	17,066.1	41,273	28,285.1	57,827.5	24,572.7	16,285.4	4,662.9
Social	8,274.5	23,865.0	2,192.6	185.1	1,330.8	415.6	0	0
Others	885	864.1	0	0	0	0	0	0
Total	*31,914.5*	*64,101.5*	*110,063.6*	*33,139.9*	*72,906.9*	*38,117.0*	*19,886.4*	*4,662.9*

* First half of the year only.

METHODS

Community Development Investments and Land Conflicts

To analyse the influence of the CD investments and their weight on the area of land under conflict, we used a linear regression model as follows:

$$LC_{k,i} = \beta_0 + \beta_1 CD_{k,i} + \varepsilon_i \quad \textbf{(1)}$$

Where LC represents the area of land (ha) under conflict (active claims at the time of the study, 2003); the sub-indices k and i represent each of the districts and plantation companies, respectively; β_0 and β_1 are the intercept and the parameter of the variable (i.e. the slope of the line) included in the model, respectively; CD is the total amount of money (in US dollars) spent on CD programmes to date (2003); and ε represents the probabilistic error of the function.

The model analyses the effects of 'total expenditure' (prior to the study) on the 'present claims' (active at the time of the study, 2003). It does not relate yearly expenditure to yearly claims so as to avoid measuring the effect of 'claims' on 'CD expenditure'.

The information required to feed into the regression was obtained from each of the companies. Each of the plantation companies provided information on CD expenditures detailed by budget lines and districts, as well as the area affected by claims in each district for their concession areas. A total of 21 districts was included in the regression (Tables 1-5).

Two visits to each company were made in March, April, August, September and October 2003 to establish personal contacts with the companies and carry out field visits to gather the data. The data were processed using software SPSS 9.0 for Windows.

Value of the Areas

The data for this section of the study represent primary data gathered over about four months, from 4 August to 31 November 2003; we spent two to three weeks in each of the locations.

Using the information gathered from the preliminary visits to each of the concession areas, we defined the requirements for the locations to be included in the study:

1. A natural area of about 100 ha;
2. The area had to be frequently used by the community;
3. The village was to be mainly formed by local inhabitants;
4. The village was located near the natural area;
5. The area was located in or near an HTI concession area.

The size of the area was determined taking into account that most of the remaining forested areas were small and considering that areas smaller than 100 ha would be too small to show the original diversity of the areas. By 'natural area' we meant an area not cleared or logged, or planted by the companies—the present vegetation structure is representative of the original structure in the area when the company obtained the HTI concession permit.

An area frequently used by the community (visited at least once a week by the villagers) to get some resources or services would ensure that the community has proper knowledge of the area and its resources.

We chose areas formed by local inhabitants and not immigrant people to guarantee that the knowledge about the resources was representative of the historical (ancestral) use in the study area.

The walking distance from the village to the natural area was considered an important factor that would determine the frequency of visits to the area and the use of its resources. A natural area within a walking distance of half a day (maximum) was considered to be 'near' the village.

Finally, when no locations with these characteristics were found in the HTI concession areas, we worked with areas outside but near the concessions. A distance of 5 km was used as the maximum.

We worked jointly with the companies' staff to choose the potential sites using a map of the concession area and their information related to it. After a pre-selection of three or four sites, we visited each site to check compliance with the stated characteristics and chose the location that best fitted the stated site requirements.

About three days were spent in the process of site selection. Once the site was chosen, we made a visit to the head of the administrative area (*Kepala Desa* or *Kepala Dusun*) to explain the research purpose and objectives, and to ask for permission to conduct the study.

The approach to conduct the research in the villages and the questionnaires to gather the required information were prepared based on the methodological approach used by Sheil *et al*. (2002) for a landscape assessment of forested areas in Kalimantan, Indonesia, and our knowledge of the present study area.

We first gathered the community members to introduce ourselves and explain the research objectives and methodology. During that first community meeting, we answered all their questions concerning our presence in the area, the research, our links with the plantation company, and the possible uses of the research product.

We asked the villagers to draw a map of the area managed by them to show the different landscape units, such as communal areas, individual parcels of forest or agriculture, water bodies and boundaries, as well as the neighbouring systems. The flow chart for this process is presented in Figure 2.

The resulting map was used during follow-up visits to the individual households. We interviewed 26-30 households per village, including men and women in similar proportions to capture their different perspectives and knowledge. Questionnaires were completed with individuals, one person was interviewed per household visited.

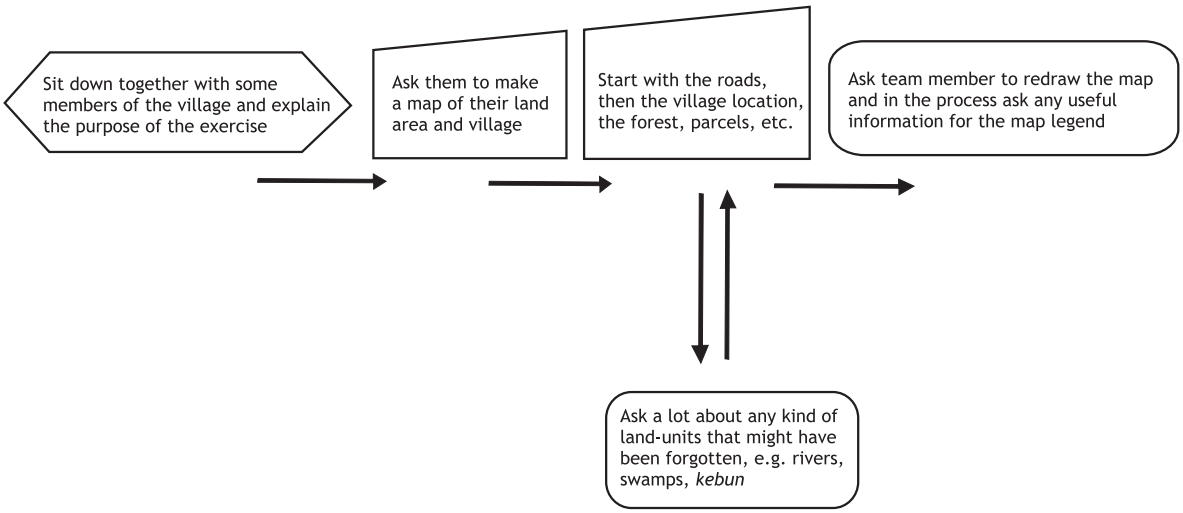
The interviews were made during early mornings and late afternoons; during the daytime period in between we accompanied the villagers to the areas where they manage or harvest natural resources. The purpose of the visits to the parcels was to confirm some of the information given by the villagers in the interview process about the products, their use and existence in these areas.

The questionnaires used for the interviews are presented in the annexes. The first questionnaire (Annex I) was adapted from Sheil *et al.* (2002) and was used to determine the relative importance of the different products for the people and to show the variety of products and uses provided by these areas.

Using the map for general understanding of the areas under analysis, we began to interview householders and ask them to list the products obtained or harvested from the areas for each of the 12 use categories included, and rank them in terms of their perceived importance, using the Pebbles Distribution Method (PDM). This method is a scoring exercise, developed to quantify group assessments of the importance of non-marketable forest products (see Box).

Villagers drawing a community map of their areas (*Photo by Nicolas Hosgood*)

Figure 2. Steps to prepare the community map



Using a second questionnaire (Annex II) and the total number of products obtained from the former exercise, we asked each householder about the size of their areas (if they used individual parcels); the frequency with which they used the resources; the amount or volume of resources used; the price of the marketable products, and possible market substitutes for the products.

To estimate the value of the products not traded, we asked the price of the same product or an agreed substitute in the local market using a market survey (Annex III). One day was spent at the local market to gather the prices for the stated products and substitutes.

The individual amounts or quantities used and prices/values quoted for each resource by each respondent within each village were averaged for the village sample using the following equation:

$$P_{r(l,i)} = \left(\frac{\sum_{j=1}^{J} p_j}{J} \right)_{r,l,i}$$

With j = 1, 2, 3,...J and $p_j \geq 0$ **(a)**

Box 1. The Pebble Distribution Method

The Pebble Distribution Method (PDM) is a scoring exercise that helps local people to assess the importance of natural resources or areas in a relative comparison of a number of resources considered important for them. Alternative names include weighted ranking and Participatory Rural Appraisal (PRA) scoring. This technique assumes that local people are the best judges of what is directly important to them. The importance of the resources is effectively expressed as a holistic rating of relative preferences. This indication of preference and importance is considered to adequately capture local priorities. In this exercise, local informants are asked to distribute 100 counters (buttons, seeds or pebbles) between labelled and illustrated cards in proportion to their importance. Interviewers must make sure that the comparative nature of the exercise is fully understood by giving at least three examples at the start of each exercise (from Sheil *et al*. 2002).

We initiated the PDM exercise by asking the interviewee to list the products he/she was obtaining from or managing in the area under assessment for the first use category (out of the 12 use categories included). Once he/she considered that there were no more products for that use category, we asked him/her to choose the 10 most important products listed (when >10 products were listed in one use category) according to his/her considerations of importance. We then asked the interviewee to draw a picture of the 10 products and placed those pictures on the floor. Finally, we asked the interviewee to distribute the buttons (provided by us) among the 10 pictures and recorded the number of buttons allocated to each product-drawing as the PDM score for the products in that use category.

Villager during the PDM exercise (*Photo by Nicolas Hosgood*)

$$Q_{r(l,i)} = \left(\frac{\sum_{j=1}^{J} q_j}{J} \right)_{r,l,i}$$

With q = 1, 2, 3,...J and $q_j \geq 0$ **(b)**

Where *P* and *Q* are the averaged price and quantity used by all the respondents '*j*' of each resource '*r*' in the given location '*l*' and plantation company '*i*'; '*p*' and '*q*' are the price and quantity quoted by each respondent in the sample.

During this process we stayed in the village, sharing a house with a local family in order to better understand the use and importance of the products and natural resources for the people. This was also to facilitate constant interaction and a better understanding of the objectives of the research for the villagers.

After obtaining the information about the range of products from each of the areas, the average volume produced and value (or price) of each of the products, we estimated the approximate value for each location as follows:

$$V_{l,i} = \left(\sum_{r=1}^{R} Q_r * P_r \right)_{l,i} \qquad \textbf{(c)}$$

Where $V_{l,i}$ is the value of the location 'l' of the plantation company 'i' including all the stated products and resources 'R' for which we calculated $P_{r(l,i)}$ and $Q_{r(l,,i)}$ from equations **(a)** and **(b)**.

For the resources with explicit prices, such as traded products, we used the price obtained for the product at the local market (selling price) provided by the villagers. For resources marketable but not traded by the villagers, we used the local market prices gathered in the nearest market, using the price at which they would need to buy the product if they could not get it from their natural areas (buying price).

For some additional resources not traded and with no observable market but for which we could agree with the people that there was a market substitute, we used the price at which they would need to buy the substitute at the local market (buying price). For the products with an expressed importance but no market price estimable, we used the Pebbles Distribution Method (PDM) approach (as used by Sheil *et al*. 2002), to estimate the relative importance of the products. We then used expressed ranking to calculate its value when other products within the same use category had a numeric value (estimated price). The resources and their corresponding real, substitute or estimated price are shown in Table 6.

Table 6. Goods obtained from the HTI areas and estimated value

Use category	Resource Indonesian name	Scientific name	Unit*	Market price (US$)	Market substitute Resource	Price (US$)	PDM estimate (US$)
Food	Asam kandis	*Garcinia parvifolia* (Miq.)	ounce				0.45
	Bacang	*Mangifera foetida* Lour	fruit	0.18			
	Bayam	*Amaranthus* spp.	ikat	0.05			
	Buah idan		kg				2.57
	Buah kulim	*Scorodocarpus borneensis* (Baill.)	fruit	0.06			
	Buah petaling	*Ochanostachys amentacea* Mast.	kg				1.5
	Buah tampuy	*Baccaurea bracteata* Muell. Arg.	fruit				0.11
	Buah tungkal		kg				0.60
	Buncis	*Phaseolus* sp.	kg	0.04			
	Cabai	*Capsicum annuum* L.	kg	0.99			
	Cempedak	*Artocarpus integer* (Thunb.) Merr.	fruit	0.22			
	Daun kulim	*Scorodocarpus borneensis* (Baill.)	lembar		bawang	0.03	
	Duku	*Lansium domesticum* Corr.	kg	0.29			
	Durian	*Durio zibethinus* Moon	fruit	0.97			
	Ikan (sungai)		kg	0.82			
	Ikan (ternak)		kg	0.94			
	Jagung	*Zea mays* L.	fruit	0.04			
	Jambu air	*Syzygium aqueum* (Burm.f.) Alston	kg	0.12			
	Jengkol	*Archidendron pauciflorum* (Benth.)kg		0.21			
	Jeruk	*Citrus aurantium* L.	kg	0.27			
	Kacang sayur	*Vigna unguiculata* (L.) Walp.	ikat	0.16			
	Kacang tanah	*Arachis hypogaea* L.	kg	1.47			
	Kangkung	*Ipomea aquatica* Forsk.	ikat	0.03			
	Kedondong hutan	*Spondias pinnata* (L.f.) Kurz	kg				0.15
	Kelapa	*Cocos nucifera* L.	fruit	0.09			
	Kencong		tungkul				0.24
	Kentang	*Solanum tuberosum* L.	kg	0.26			
	Ketimun	*Cucumis sativus* L.	kg	0.47			
	Kisik	*Luffa acutangula* L.	kg	0.32			
	Kol	*Brassica oleracea* L.	kg	0.04			
	Kopi (arabica)	*Coffea arabica* L.	kg	0.53			
	Kopi (robusta)	*Coffea canephora* var. *Robusta*	kaleng	6.47			

Notes: * Units: ikat = bundle or bunch; lembar = thread or skein; tungkul = lump or club; kaleng = tin (box); karung = coarse bag or sack; cupak = bowl; lahas = (palm) leaves.

*** No valuation was possible for these resources.

Table 6. *Continued*

Use category	Resource Indonesian name	Scientific name	Unit*	Market price (US$)	Market substitute Resource	Price (US$)	PDM estimate (US$)
	Labu	*Lagenaria siceraria* (Molina)	fruit	0.06			
	Mangga	*Mangifera indica* L.	kg	0.29			
	Nanas	*Ananas comosus* (L.) Merr.	fruit	0.15			
	Nangka	*Artocarpus heterophyllus* Lam.	fruit	0.12			
	Padi	*Oryza sativa* L.	kg	0.28			
	Pakis		ikat				0.31
	Pepaya	*Carica pepaya* L.	fruit	0.25			
	Petay	*Parkia speciosa* Hassk.	ikat	0.33			
	Pisang	*Musa paradisiaca* var. *Sapientum*	bunch	0.38			
	Rambutan	*Nephelium lappaceum* Linn.	kg	0.14			
	Salak	*Salacca zalacca* (Gaertn.) Voss	kg	0.59			
	Sawi putih	*Brassica chinensis* L.	karung	0.35			
	Sawo	*Manilkara kauki* (L.) Dubard.	kg	0.47			
	Sirsak	*Annona muricata* L.	fruit	0.35			
	Terong	*Solanum melongena* L.	kg	0.24			
	Tomat	*Lycopersicon esculentum* Mill.	kg	0.19			
	Ubi kayu	*Manihot esculenta* L.	kg	0.10			
	Ubi manggalo		cupak	0.41			
	Ubi rambat	*Ipomea batatas* (L.) L.	kg	0.15			
	Wortel	*Daucus carota* L.	kg	0.15			
Medicine							
	Akar bacang hutan		times/year	tandiare (6)	0.28		
	Akar kunyit-kunyit		times/year	resochin (4)	0.47		
	Akar sanglung		times/year	zoralin (10)	3.53		
	Akar sejanget		times/year	bodrex (9)	0.53		
	Akar serikan		times/year	tandiare (6)	0.28		
	Akar setupay		times/year	cursil (4)	3.88		
	Akar suyo		times/year	konidin (9)	0.42		
	Antowali/ antawali		times/year	resochin (5)	0.59		
	Bawang merah	*Allium cepa* L. f. *ascalonicum*	times/y 0.13				
	Bonglai	*Oroxylum indicum* (L.) Vent.	times/year	tolak angin (1)	0.12		

Notes: * Units: ikat = bundle or bunch; lembar = thread or skein; tungkul = lump or club; kaleng = tin (box); karung = coarse bag or sack; cupak = bowl; lahas = (palm) leaves.

*** No valuation was possible for these resources.

Table 6. *Continued*

Use category	Resource Indonesian name	Scientific name	Unit*	Market price (US$)	Market substitute Resource	Price (US$)	PDM estimate (US$)
	Buah mengkudu	*Morinda citrifolia* L.	times/year		adalat (3)	0.62	
	Daun alpukat	*Persea americana* Mill.	times/year		tandiare (6)	0.28	
	Daun bungo rayo	*Hibiscus rosa-sinensis* L.	times/year		lasegar (1)	0.29	
	Daun capo	*Blumea balsamifera* (L.) DC.	times/year		bodrexin (9) Tandiare (6)	0.35	
	Daun jarum-jarum		times/year		bodrex (9)	0.53	
	Daun kapuk/ kapok	*Ceiba pentandra* (L.) Gaertn	times/year		oskadon (3) Resochin (4)	0.31	
	Daun keci beling	*Pararuellia napifera* (Zoll.)	times/year		urotracin (10)	3.47	
	Daun ketepeng	*Cassia alata* L.	times/year		zoralin (10)	3.53	
	Daun kopau	*Livistona rotundifolia* Mart.	times/year		bodrex (9)	0.53	
	Daun kumis kucing	*Orthosiphon aristatus* (Bl.) Miq.	times/year		pilkita (1)	0.12	
	Daun pepaya	*Carica pepaya* L.	times/year		Jamu pegal linu tandiare (6) Resochin (4)	0.38	
	Daun periau		times/year		komix (6)	0.71	
	Daun piladang		times/year		paramex (2)	0.12	
	Daun pulih bayam		times/year		bodrex (9)	0.53	
	Daun puying		times/year		tandiare (6)	0.28	
	Daun sake		times/year		bodrex (9)	0.53	
	Daun sibunbun		times/year		tandiare (6)	0.28	
	Daun sidingin	*Kalanchoe pinnata* (Lam.) Pers.	times/year		paramex (2)	0.12	
	Daun sirih	*Piper betle* L.	times/year		0.03		
	Daun sirih hantu		times/year		bodrex (9)	0.53	
	Daun sitawar	*Costus speciosus* (Koenig) Sm.	times/year		paramex (2)	0.12	
	Daun sonam		times/year		pegal linu (1)	0.14	
	Daun sugitam		times/year		tandiare (6)	0.28	
	Daun tulang tiga	*Cinnamomum sintok* Bl.	times/year		resochin (4)	0.47	
	Getah cindai		times/year		betadine (1)	0.29	
	Getah kayu salak	*Salacca zalacca* (Gaertn.) Voss	times/year		borax (1)	0.35	
	Getah sekubin		times/year		bodrex (9)	0.53	
	Getah senduk-senduk	*Endospernum peltatum* Merr.	times/year		scabisit (1)	0.78	

Notes: * Units: ikat = bundle or bunch; lembar = thread or skein; tungkul = lump or club; kaleng = tin (box); karung = coarse bag or sack; cupak = bowl; lahas = (palm) leaves.

*** No valuation was possible for these resources.

Table 6. *Continued*

Use category	Resource Indonesian name	Scientific name	Unit*	Market price (US$)	Market substitute Resource	Price (US$)	PDM estimate (US$)
	Getah tampang	*Artocarpus rotunda* (Houtt.)	times/year		saridon (10)	0.59	
	Jahe	*Zingiber officinale* Rosc.	times/year		antangin (1) Tolak angin (1)	0.14	
	Jambu biji	*Psidium guajava* L.	times/year		tandiare (6)	0.28	
	Jeringau/ jarangau	*Acorus calamus* L.	times/year		tolak angin (1)	0.12	
	Jeruk nipis	*Citrus aurantifolia* (Christm.)	times/year	0.18			
	Jeruk purut	*Citrus hystrix* DC.	times/year		komix (6)	0.71	
	Kayu bani		times/year		tandiare (6)	0.28	
	Kayu penawar kuning	*Bauhinia* spp.	times/year		cursil (3)	3.88	
	Kayu sigma		times/year		visine (1)	0.71	
	Kelubi		times/year		bodrex (9)	0.53	
	Kencur	*Kaempferia galanga* L.	times/year	0.12			
	Kulit batang duku	*Lansium domesticum* Corr.	times/year		resochin (12)	0.71	
	Kulit batang kelengkeng	*Dimocarpus longan* Lour.	times/year		tandiare (6)	0.28	
	Kunyit	*Curcuma longa* L.	times/year	0.12**	sangobion (1) Tandiare (6) Bodrex (9)	0.55	
	Limau pagar	*Fortunella* spp. Swingle	times/year		bodrex (9)	0.53	
	Madu hutan		times/year		aladina (3)	0.53	
	Pasak bumi	*Eurycoma longifolia* Jack	times/year		resochin (5) Aladina (3)	0.57	
	Pucu pau-pau	*Euodia latifolia* DC.	times/year		promag (2)	0.04	
	Rumput cimabi		times/year		tandiare (6)	0.28	
	Sahang/merica	*Piper nigrum* L.	times/year		tolak angin (1)	0.12	
	Seletup		times/year		adalat (10)	1.18	
	Tebing batu		times/year		tandiare (6)	0.28	
	Temu item		times/year		multivitamin (10)	0.35	
	Temu lawak	*Curcuma xanthorrhiza* Roxb.	times/year		sangobion (10) Bodrex (9)	0.56	

** In one village 'kunyit' could be bought on the market while in others not.

Notes: * Units: ikat = bundle or bunch; lembar = thread or skein; tungkul = lump or club; kaleng = tin (box); karung = coarse bag or sack; cupak = bowl; lahas = (palm) leaves.

*** No valuation was possible for these resources.

Table 6. *Continued*

Use category	Resource Indonesian name	Scientific name	Unit*	Market price (US$)	Market substitute Resource	Price (US$)	PDM estimate (US$)
Construction							
	Bambu	*Bambusoideae* spp.	pole	0.29			
	Batang pinang	*Areca catechu* L.	pole	0.12			
	Daun nipah	*Nypa fruticans* Wurmb.	lahas	0.07			
	Daun serdang	*Livistona rotundifolia* Mart.	lahas	0.24			
	Kayu antuy		m^3	47.06			
	Kayu api-api/antiapi		m^3	47.06			
	Kayu api-api/antiapi		pole	0.18			
	Kayu apas-apas		m^3	47.06			
	Kayu ahubang		pole	0.24			
	Kayu arang-arang	*Diospyros maingayi* (Hiern) Bakh.	m^3	47.06			
	Kayu asam-asam	*Swintonia floribunda* Griff.	pole	0.18			
	Kayu bayur	*Pterospermum javanicum* Jungh.	m^3	47.06			
	Kayu balam merah	*Palaquium gutta* (Hook.f.) Baillon	m^3	70.59			
	Kayu baneh		pole	0.21			
	Kayu berangan	*Castanopsis argentea* (Bl.) DC.	m^3	70.59			
	Kayu dolo-dolo		pole	0.21			
	Kayu dori		m^3	47.06			
	Kayu durian	*Durio zibethinus* Murr.	m^3	58.82	Balam merah	70.59	
	Eucalyptus	*Eucalyptus* sp.	m^3	38.24			
	Kayu giam	*Cotylelobium* spp.	pole	0.18			
	Kayu irang		pole	0.35			
	Jambu-jambu	*Syzygium* spp.	pole	0.18			
	Kayu jenang		m^3	35.29			
	Kacang-kacang	*Strombosia javanica* Bl.	m^3	88.24			
	Kayu kasai	*Pometia pinnata* Forst.	pole	0.18			
	Kedondong	*Spondias pinnata* (L.f.) Kurz	m^3	47.06			
	Kayu kempas	*Koompassia malaccensis* Maing.	m^3	211.76			
	Kayu keranji	*Dialium indum* L.	m^3	294.12			
	Kayu kedembe		pole	0.24			
	Kayu keruing	*Dipterocarpus* spp.	m^3	90.20			
	Kayu ketawak		pole	0.35			

Notes: * Units: ikat = bundle or bunch; lembar = thread or skein; tungkul = lump or club; kaleng = tin (box); karung = coarse bag or sack; cupak = bowl; lahas = (palm) leaves.

*** No valuation was possible for these resources.

Table 6. *Continued*

Use category	Resource Indonesian name	Scientific name	Unit*	Market price (US$)	Market substitute Resource	Price (US$)	PDM estimate (US$)
	Kayu ketawak		m^3	35.29			
	Kayu klako		m^3	47.06			
	Kayu kulim	*Scorodocarpus borneensis* (Baill.)	m^3	211.76			
	Kayu kulim	*Scorodocarpus borneensis* (Baill.)	pole	0.24			
	Kayu kures		m^3	58.82			
	Kayu langlo		m^3	0.18			
	Kayu leban	*Vitex pubescens* Heyne ex. Wall	m^3	0.18			
	Kayu mahang	*Macaranga triloba* (Blume)	m^3	47.06			
	Kayu mahang	*Macaranga triloba* (Blume)	pole	0.15	Medang telur	0.35	
	Kayu mata keli	*Chantium confertum* Korth	pole	0.24			
	Kayu maubuluh		pole	0.18			
	Medang telur	*Dehaasia cuneata* Bl.	m^3	35.29			
	Medang telur	*Dehaasia cuneata* Bl.	pole	0.35			
	Medang simpai	*Alseodaphne* spp.	pole	0.71			
	Medang so	*Alseodaphne* spp.	m^3	70.59			
	medang batu	*Dehaasia caesia* Blume	m^3	58.82			
	medang keladi	*Litsea costalis* (Nees) Koesterm.	m^3	47.06			
	medang kuning	*Litsea angulata* Bl.	m^3	58.82			
	medang kunyit	*Actinodaphne* spp.	m^3	58.82			
	mengkudu	*Morinda citrifolia* L.	Pole	0.18			
	Kayu mengkidai		pole	0.12			
	Kayu meranti	*Shorea* spp.	m^3	82.35			
	Kayu nahung		m^3	41.18			
	Kayu napo	*Dacryodes rugosa* H.J.L.	pole	0.18			
	Gerunggang	*Cratoxylum arborescens* (Vahl.)	m^3	64.71	Kayu pentangur	58.82	
	Kayu nyatoh labo		m^3	35.29			
	Kayu nyatuh/ nyatoh		pole	0.35			
	Kayu pelai	*Alstonia* spp.	m^3	58.82			
	Pelangas	*Aporosa dioca* (Roxb.) Mull. Arg.	pole	0.53			
	Kayu pentangur		m^3	58.82			
	Kayu pentangur		pole	0.35			
	Kayu ramin	*Gonystylus* spp.	m^3	58.82			

Notes: * Units: ikat = bundle or bunch; lembar = thread or skein; tungkul = lump or club; kaleng = tin (box); karung = coarse bag or sack; cupak = bowl; lahas = (palm) leaves.

*** No valuation was possible for these resources.

Table 6. *Continued*

Use category	Resource Indonesian name	Scientific name	Unit*	Market price (US$)	Market substitute Resource	Price (US$)	PDM estimate (US$)
	Kayu pitatar		pole	0.35			
	Kayu pitatar		m^3	41.18			
	Pisang-pisang	*Kandelia candel* (L.) Druce	m^3	52.94			
	Kayu punak	*Tetramerista glabra* Miq.	m^3	70.59			
	Kayu putat lembek		m^3	52.94			
	Kayu puyan		pole	0.35			
	Kayu rengas	*Gluta renghas* L.	m^3	58.82			
	Kayu seminai	*Madhuca* spp.	m^3	211.76			
	Kayu sengon	*Paraserianthes falcataria* (L.)	pole	0.18			
	Kayu serdang	*Livistona rotundifolia* Mart.	pole	2.94			
	Kayu seru		pole	0.65			
	Kayu setepung		pole	0.12			
	Kayu setumpul		pole	0.18			
	Kayu sigam		pole	0.18			
	Kayu silum		pole	0.21			
	Kayu sungkai	*Peronema canescens* Jack.	pole	0.15			
	Kayu terantang	*Campnosperma* spp.	m^3	35.29			
	Kayu terap	*Artocarpus elasticus* Reinw. ex. Bl.	m^3	61.76			
	Kayu tusam	*Pinus merkusii* Jungh. & De Vr.	m^3	35.29			
	Kayu tinjau		pole	0.35			
	Kayu tulang-tulang		pole	0.12			
	Kayu ubar		m^3	94.12			
	Kayu ubar		pole	0.59			
	Rotan	*Calamus* spp.	m	0.12			
	Rotan	*Calamus* spp.	kg	0.04			
	Kayu campur		pole	0.53			
	Tools						
	Badak	*Bambusoideae* spp.	basket	0.29			
	Bakul	*Pandanus* spp.	bowl	0.59			
	Centong	*Peronema canescens* Jack	spoon	0.29			
	Gilingan padi		mortar	4.12			

Notes: * Units: ikat = bundle or bunch; lembar = thread or skein; tungkul = lump or club; kaleng = tin (box); karung = coarse bag or sack; cupak = bowl; lahas = (palm) leaves.

*** No valuation was possible for these resources.

Table 6. *Continued*

Use category	Resource Indonesian name	Scientific name	Unit*	Market price (US$)	Market substitute Resource	Price (US$)	PDM estimate (US$)
	Hiasan		item	3.53			
	Hulu kapak	*Koompassia malaccensis* Maing.	shaft	0.47			
	Hulu parang	*Hevea brasiliensis* Muell. Arg.	handle	0.25			
	Hulu sabit	*Hevea brasiliensis* Muell. Arg. or *Sloetia elongata* Kds.	handle	0.25			
	Jendela		window	14.71			
	Keranjang	*Calamus* spp./*Bambusoideae* spp.	basket	4.12			
	Lemari		item	47.06			
	Lesung	*Alseodaphne* spp.	mortar	2.82			
	Lukah ikan	*Bambusoideae* spp.	trap	0.59			
	Meja		table	20.59			
	Pancing		rod	0.47			
	Pegangan golok	*Hevea brasiliensis* Muell. Arg.	handle	0.24			
	Pintu		door	29.41			
	Sampan		canoe	47.06			
	Sapu lidi (aren)	*Arenga pinnata* (Wurmb.) Merr.	broom	0.18			
	Sapu lidi (kelapa)	*Cocos nucifera* L.	broom	0.19			
	Sendok	*Cocos nucifera* L.	spoon	0.12			
	Serekitan		stick	0.12			
	Sumpik	*Pandanus* spp.	bag	0.59			
	Tanggu	*Calamus* spp.	utensil	1.18			
	Tangkai beliung	*Sloetia elongata* Kds.	shaft	0.18			
	Tangkai cangkul	*Koompassia malaccensis* Maing. or *Sloetia elongata* Kds.	shaft	0.74			
	Tangkai kujur	*Sloetia elongata* Kds.	shaft	2.35			
	Tangkinan		box	0.88			
	Tempat tidur		bed	41.18			
	Tikar mengkawan		mat	2.94			
	Tikar pandan	*Pandanus* spp.	mat	2.35			
	Tikar rumbai	*Pandanus* spp.	mat	2.35			
	Tuai/sepitan	*Bambusoideae* spp.	stick	0.04			

Notes: * Units: ikat = bundle or bunch; lembar = thread or skein; tungkul = lump or club; kaleng = tin (box); karung = coarse bag or sack; cupak = bowl; lahas = (palm) leaves.

*** No valuation was possible for these resources.

Table 6. *Continued*

Use category	Resource Indonesian name	Scientific name	Unit*	Market price (US$)	Market substitute Resource	Price (US$)	PDM estimate (US$)
Firewood							
	Kayu ahubang		ikat	0.35			
	Kayu apas-apas		ikat	0.35			
	Kayu api-api		ikat	0.35			
	Kayu arang-arang	*Diospyros maingayi* (Hiern) Bakh.	ikat	0.24			
	Kayu belanti		ikat	0.24			
	Kayu dolo-dolo		ikat	0.35			
	Kayu karet	*Hevea brasiliensis* Muell. Arg.	ikat	0.29			
	Kayu kasai	*Pometia pinnata* Forst.	ikat	0.24			
	Kayu kedembe		ikat	0.41			
	Kayu kelengkeng	*Dimocarpus longan* Lour.	ikat	0.41			
	Kayu kemudan		ikat	0.12			
	Kayu kliat		ikat	0.41			
	Kayu kopi	*Coffea arabica* L.	ikat	0.24			
	Kayu kumpai benang		ikat	0.24			
	Kayu langlo		ikat	0.41			
	Kayu leban		ikat	0.41			
	Kayu lenggok		ikat	0.12			
	Kayu medang kua		ikat	0.12			
	Kayu pelangas		ikat	0.41			
	Kayu rambutan	*Nephelium lappaceum* L.	ikat	0.24			
	Kayu samak		ikat	0.12			
	Kayu sengon	*Paraserianthes falcataria* (L.)	ikat	0.41			
	Kayu seru		ikat	0.41			
	Kayu silum		ikat	0.35			
	Kayu sungkai	*Peronema canescens* Jack	ikat	0.41			
	Kayu tusam	*Pinus merkusii* Jungh. & De Vr.	ikat	0.35			
	Kayu campur		ikat	0.24			
Marketable Items							
	Cabai	*Capsicum annuum* L.	kg	0.82			
	Cempedak	*Artocarpus integer* (Thunb.) Merr.	fruit	0.18			

Notes: * Units: ikat = bundle or bunch; lembar = thread or skein; tungkul = lump or club; kaleng = tin (box); karung = coarse bag or sack; cupak = bowl; lahas = (palm) leaves.

*** No valuation was possible for these resources.

Table 6. *Continued*

Use category	Resource Indonesian name	Scientific name	Unit*	Market price (US$)	Market substitute Resource	Price (US$)	PDM estimate (US$)
	Duku	*Lansium domesticum* Corr.	kg	0.21			
	Durian	*Durio zibethinus* Murr.	fruit	0.78			
	Hiasan		item	3.53			
	Ikan (sungai)		kg	0.82			
	Ikan (ternak)		kg	1.06			
	Jendela		window	14.71			
	Jengkol	*Archidendron pauciflorum* (Benth.)	kg	0.13			
	Jeruk	*Citrus aurantium* L.	kg	0.27			
	Kacang sayur	*Vigna unguiculata* (L.) Walp	ikat	0.16			
	Kangkung	*Ipomea aquatica* Forsk.	ikat	0.03			
	Karet	*Hevea brasiliensis* Muell.Arg.	kg	0.25			
	Kelapa	*Cocos nucifera* L.	fruit	0.06			
	Kemenyan	*Styrax benzoin* Dryand.	kg	6.47			
	Kentang	*Solanum tuberosum* L.	kg	0.26			
	Ketimun	*Cucumis sativus* L.	kg	0.47			
	Kol	*Brassica oleracea* L.	kg	0.04			
	Kopi (arabica)	*Coffea arabica* L.	kg	0.47			
	Kopi (robusta)	*Coffea canephora* var. *Robusta*	kaleng	6.47			
	Lemari		item	47.06			
	Meja		item	17.65			
	Padi	*Oryza sativa* L.	kg	0.26			
	Pepaya	*Carica pepaya* L.	fruit	0.12			
	Petay	*Parkia speciosa* Hassk.	ikat	0.29			
	Pintu		door	29.41			
	Pisang	*Musa paradisiaca* L.	bunch	0.47			
	Rambutan	*Nephelium lappaceum* L.	kg	0.29			
	Rotan hitam	*Calamus* spp.	kg	0.04			
	Sangkar burung		cage	2.35			
	Sawi putih	*Brassica chinensis* L.	karung	0.35			
	Sawit	*Elaeis guineensis* Jacq.	kg	0.05			
	Tempat tidur		bed	41.18			
	Terong	*Solanum melongena* L.	kg	0.24			

Notes: * Units: ikat = bundle or bunch; lembar = thread or skein; tungkul = lump or club; kaleng = tin (box); karung = coarse bag or sack; cupak = bowl; lahas = (palm) leaves.

*** No valuation was possible for these resources.

Table 6. *Continued*

Use category	Resource Indonesian name	Scientific name	Unit*	Market price (US$)	Market substitute Resource	Price (US$)	PDM estimate (US$)
	Tikar rumbai	*Pandanus* spp.	mat	2.35			
	Tomat	*Lycopersicon esculentum* Mill.	kg	0.19			
	Ubi kayu	*Manihot esculenta* L.	kg	0.06			
	Ubi manggalo		cupak	0.29			
	Ubi rambat	*Ipomea batatas* (L.) L.	kg	0.09			
	Wortel	*Daucus carota* L.	kg	0.15			
Marketable Items (Timber)							
	Kayu balam merah	*Palaquium gutta* (Hook.f.)	m^3	38.24			
	Kayu balau	*Hopea* spp. or *Shorea* spp.	m^3	61.76			
	Kayu bayang	*Hopea dryobalanoides* Miq.	m^3	41.18			
	Kayu bayur	*Pterospermum javanicum* Jungh	m^3	12.94			
	Kayu daru-daru	*Cantleya corniculata* (Becc.)	m^3	52.94			
	Kayu jelutung	*Dyera* spp.	m^3	23.53			
	Kayu kempas	*Koompassia malaccensis* Maing.	m^3	58.82			
	Kayu keranji	*Dialium indum* L.	m^3	105.88			
	Kayu keruing	*Dipterocarpus* spp.	m^3	64.71			
	Kayu kulim	*Scorodocarpus borneensis* (Baill.)	m^3	82.35			
	Kayu medang telur	*Dehaasia cuneata* Bl.	m^3	23.53			
	Kayu meranti	*Shorea* spp.	m^3	52.94			
	Kayu nyatoh labo	*Ganua* spp. or *Palaquium* spp. or *Payena* spp.	m^3	23.53			
	Kayu pentangur		m^3	58.82			
	Kayu punak	*Tetramerista glabra* Miq.	m^3	38.24			
	Kayu seminai	*Madhuca* spp.	m^3	82.35			
	Kayu terantang	*Campnosperma* spp.	m^3	23.53			
	Kayu terap	*Artocarpus elasticus* Reinw.	m^3	12.94			
	Kayu ubar	*Glochidion* spp. or *Eugenia* spp.	m^3	55.29			

Notes: * Units: ikat = bundle or bunch; lembar = thread or skein; tungkul = lump or club; kaleng = tin (box); karung = coarse bag or sack; cupak = bowl; lahas = (palm) leaves.

*** No valuation was possible for these resources.

Table 6. *Continued*

Use category	Resource Indonesian name	Scientific name	Unit*	Market price (US$)	Market substitute Resource	Price (US$)	PDM estimate (US$)
Hunting location***							
	Buah kayu aro						
	Buah kayu kerang						
	Buah kayu perawas	*Litsea odorifera* Valet.					

Notes: * Units: ikat = bundle or bunch; lembar = thread or skein; tungkul = lump or club; kaleng = tin (box); karung = coarse bag or sack; cupak = bowl; lahas = (palm) leaves.

*** No valuation was possible for these resources.

FIELDWORK AREAS

The valuation of the areas required fieldwork to gather the required primary data. The fieldwork was conducted in or near the HTI concession areas of each of the plantation companies, including the sub-villages or settlements of Talang Belanti, Bagan Tengah, Jiat Kramat, Kuntu Toeroba and Lumban Purba (see Table 7).

Talang Belanti – South Sumatra

Talang Belanti is located inside the HTI concession area of MHP, at a distance of only about 4 km from one of the MHP district offices, *Lubuk Guci*. The community was formed mainly by locals dedicated to farming activities, such as rubber tapping in a forested area of about 200 ha, rice and non-rice food crops (*palawija*). A total of 52 families formed the community, with frequent contact with the town of Pendopo, where there was a relatively large daily market.

The families comprised mainly older people because the younger members tended to move to the cities looking for jobs. The houses were mainly built with local materials such as wood, palm leaves, bamboo and rattan. There was no agricultural machinery in the area; in working their land, they relied mostly on traditional equipment. The main luxury goods were radios. None of the houses had electricity and the village also lacked running water. The only source of water was a little pond built by MHP in the middle of the village, but some of the villagers had sunk wells near the pond.

Bagan Tengah – Jambi

Unlike Talang Belanti, Bagan Tengah sub-village is located outside but near the HTI concession. It is about 2 km from the WKS concession area and about 6 km from the nearest WKS district office.

This sub-village was created in 1982 with a programme from the Social Department of the Indonesian Government for improving the prosperity of rural society (*Dusun Binaan*). There were 75 families living there, with a total of about 350 inhabitants. The majority of the residents were locals, mostly Malays (about 80%), who moved from Parit Culum village, a larger village where the people from Bagan Tengah usually bought their daily food in a weekly market.

There were still many young (20-27 years old) people living in the village, working as loggers (*ongkak*) in the forested area, which the community had laid claim to and regarded as community property. This area is located near Parit Culum and covers about 500 ha. Other areas were occupied by rubber plantations, rice fields, durian (*Durio zibethinus* Moon), and rambutan (*Nephelium lappaceum* L.) fruit trees. The most common housing materials were local wood species used to make planks, beams and rafters, although some houses were built with homemade bricks and had concrete foundations. For roofing, either galvanized metal sheets or palm leaves (*daun serdang*, *Livistonia rotundifolia*) were used. People used batteries or generators to supply their electricity, mostly used for lighting, radio and television. Each house had its own well.

Jiat Keramat – Riau

The sub-village of Jiat Keramat, in which some 75 families resided, is located next to the Arara Abadi concession area and separated from it

Table 7. Areas where the 'participatory' valuation study took place

Province	District	Sub-District	Village	Settlement
South Sumatra	Muara Enim	Gunung Megang	Padang Bindu	**Talang Belanti**
Jambi	Muara Sabak	Bedahara	Parit Culum	**Bagan Tengah**
Riau	Kampar		**Kuntu Toeroba**	**Jiat Kramat**
North Sumatra	Humbang Hasundutan	Dolok Sanggul	**Lumban Purba**	

Note: The areas studied are shown in bold.

People can travel large distances to get to the areas where plantation companies are undertaking activities (*Photo by Julia Maturana*)

only by the Penaso River. It was a poor village, where some of the people were still using wood, bark, rattan and palm leaves for house construction. All members of the sub-village were Sakai people who had lived in the area since 1944. Most of the people made a living from fishing, either by trapping (*lukah*) or using a fishing rod (*taju*).

The area managed by this community was about 200 ha, including a degraded forest (*belukar*) surrounding the sub-village. The people usually planted the areas with rubber trees or oil palm. They had two sources of water—wells for drinking and a river for bathing.

Kuntu Toeroba – Riau

Kuntu Toeroba is located near the RAPP concession area, in the Indaragiri Hulu sector. It was a modern village, with around 1409 families and 4539 resident inhabitants (according to the head of the village). Located far from the main road, the village had electricity, schools, a market, traditional restaurants, workshops, builders' yards, and other amenities. As with the majority of Malay tribe people, the villagers made a living from selling rubber they tapped from the forest or their gardens, selling timber harvested from about 11 000 ha of a secondary forest, and trading agricultural goods. The forest has been commonly used since the *Reformasi* (1998) and every member of the village had access to it.

Lumban Purba – North Sumatra

Located outside the TPL concession, the villagers of Lumban Purba had claimed an area of about 153 ha of planted pine forest inside the concession area. The main source of living was farming, including rice, coffee and non-rice food crops. There were about 200 families in the village and most of them were locals from the Batak tribe. The village was supplied with electricity and, although still a simple village, most of the houses were of brick and tile construction.

Lumban Purba is located near a relatively large city, Dolok Sanggul, with a daily stocked market. People did not have any difficulty in providing food for their daily consumption.

RESULTS

Influence of Community Development Investments on the Area Affected by Land Claims

The values of the intercept and the parameter (slope), and individual t values are presented below (t values in parentheses). The asterisk means that the variable is representative at α (standard error) = 0.05 and two asterisks at α = 0.01.

$$LC = 2344^{*} + 0.0025\ CD^{**}$$
$$(3.250) \quad (5.117)$$

Money invested in CD has had a statistically positive effect on (i.e. has increased) the area of land under conflict. Districts with higher CD expenses showed larger areas of land affected by claims at the time of the study. Thus CD investments seem to promote land claims rather than reducing them. The value of the parameter (0.0025) shows that for every US$400 invested in CD, one additional hectare of land had come under claim (ratio = US$1 to 0.0025 ha).

From the intercept, we would expect to observe 2344 ha of land affected by claims in each district holding HTI concessions, even if the CD expenses were zero. This implies that the size of the area under conflict is also influenced by other factors not included in the model.

The R^2 and adjusted R^2 values for the model are 0.58 and 0.56, respectively, which means that about 58% of the variation in the area (ha) under claim is explained by the changes or variations in CD investments. Other variables, not included in the model, would jointly explain about 42% of the variations in the size of this area. In other words, the model fits the data relatively well, although there are additional elements explaining the size of the area of land affected by claims.

Valuation of the Areas

Diversity of Resources Used by Local Communities

Before we put a value on the resources and products harvested by local communities in HTI areas, it is worth looking at the range and diversity of these resources and products. Indeed, the number and variety of products that we recorded is, in itself, a significant result. A large number of products were cited for each of the seven use-categories mentioned except for hunting, where only four products were found (Table 8).

The figures in the table refer to individual products, which can in most cases be defined as a particular use of a plant or animal species, e.g. rice as a food item, *meranti* (*Shorea* spp.) wood as construction material. However, some species can be used to make more than one product—for example, rattan is included in the construction category as it is often used for house-building purposes (for tying poles or beams together), but it is also included in the tools category because it is also used for making baskets. Products with the same use but coming from different plant species were accounted separately if they had different (monetary) values, e.g. roofing material made from serdang leaves (*Livistonia rotundifolia*) is more durable and therefore more valuable than roofing material made from nipah leaves (Nypa

Table 8. Number of important products/resources per use category in the studied villages

Category	No. products/resources
Construction	82
Medicine	62
Food	51
Marketable	49
Tools	33
Firewood	26
Hunting	4
Total	*307*

fruticans); consequently we separated the 'roof leaves' into the two products. Although the table shows the number of products and not the number of species these products are made from, the number of products and the number of species is almost the same, as in the majority of cases one product equates to one species.

From the complete set of interviewed householders in the areas of North Sumatra, Riau, Jambi and South Sumatra, we obtained information on a total of 307 products important for the people in seven categories of use (out of the 12 categories proposed).

These products were observed in two landscape units in the locations: the agricultural fields (*ladang*) and the forested area (*kebun*); the latter representing the areas with secondary forests, sometimes enriched with rubber trees.

No resource was considered critical by the villagers, and market substitutes are found for most (96%) of them. The only products without a market substitute were some fruits from forest tree species, e.g. *buah kulim* (*Scorodocarpus borneensis*), which are used by people from the Sakai tribe in Riau.

Table 9 shows the most important products for the people in each village per use category.

Value of Resources Used by Local Communities

Using the data collected during the interviews, we calculated an average value of the land-use per hectare per year for each village studied.

This calculated value includes the two landscape units managed by the villagers—the field (ladang) areas and the forest (kebun) areas. The land-use value per hectare ranges from US$350 to US$730 per year, representing US$630-1400 per household per year (Table 10). The wide ranges are in harmony with the diversity of systems: while in some locations the villagers had small areas managed more intensely for agriculture showing a high value per hectare but low value per household (e.g. Lumban Purba), other locations had large forested areas with low value per hectare but high value per household (e.g. Kuntu Toeroba).

Table 9. Most important products in each use category for each area

Use category	Area	Province	Product name Indonesian	English/Scientific	PDM value (%)
Food	Belanti	South Sumatra	Beras	Rice	29
			Cabai	Chilli	13
	Bagan Tengah	Jambi	Beras	Rice	39
			Kelapa	Coconut	17
	Kuntu Toeroba	Riau	Cabai	Chilli	16
			Singkong	Cassava	13
	Jiat Kramat	Riau	Ikan Tawar	Fish (from river)	44
			Ubi manggalo	Cassava	36
	Lumban Purba	North Sumatra	Beras	Rice	52
			Tomat	Tomatoes	8
Medicine	Belanti	South Sumatra	Pasak bumi	Snake wood *Eurycoma longifolia* (Jack)	26
		Kulit batang duku		Duku tree bark *Lansium domesticum* (Corr.)	13
	Bagan Tengah	Jambi	Kunyit	Turmeric *Curcuma longa* L.	21
			Kencur	East-Indian galanggale *Kaempferia galanga* L.	15
	Kuntu Toeroba	Riau	Daun capo	unknown *Blumea balsamifera* (L. DC.)	19
			Daun sugitam	unknown	17
	Jiat Kramat	Riau	Daun jarum-jarum	unknown	26
			Kunyit	Turmeric *Curcuma longa* L.	19
	Lumban Purba	North Sumatra	Bawang merah	Shallot *Allium cepa* (L.) *f. ascalonicum*	100a
Construction	Belanti	South Sumatra	Kayu sungkai	Soongkai *Peronema canescens* (Jack)	22
			Kayu mengkudu	Indian mulberry *Morinda citrifolia* (L.)	10
	Bagan Tengah	Jambi	Kayu kacang-kacang	unknown *Strombosia javanica* (Bl.)	18
			Kayu napo	unknown *Dacryodes rugosa* (H.J.L.)	13
	Kuntu Toeroba	Riau	Kayu meranti	Meranti *Shorea* spp.	16
			Kayu pentangur	unknown	12
	Jiat Kramat	Riau	Kayu meranti	Meranti *Shorea* spp.	21
			Kayu giam	Resak *Cotylelobium* spp.	17
	Lumban Purba	North Sumatra	Kayu antiapi	unknown	23
			Kayu campur	Species mixture	20
Tools	Belanti	South Sumatra	Serekitan	Wooden stickb	31
			Tuai/sepitan	Wooden stickc	23
	Bagan Tengah	Jambi	Sapu lidi	Broom	33
			Hulu parang	Machete handle	18
	Kuntu Toeroba	Riau	Hulu parang	Machete handle	46
			Tangkai cangkul	Hoe shaft	34
	Jiat Kramat	Riau	Tangkai cangkul	Hoe shaft	18
			Tikar pandan	Mat	14
	Lumban Purba	North Sumatra	Tangkai cangkul	Hoe shaft	87
			Hulu sabit	Sickle handle	13

Table 9. *Continued*

Use category	Area	Province	Product name Indonesian	English/Scientific	PDM value (%)
Firewood	Belanti	South Sumatra	Kayu karet	Rubber tree *Hevea brasiliensis* (Muell. Arg.)	32
			Kayu leban	Hairy-leafed molane *Vitex pubescens* (Heyne ex. Wall.)	26
	Bagan Tengah	Jambi	Kayu karet	Rubber tree *Hevea brasiliensis* (Muell. Arg.)	86
			Kayu Belanti	unknown	8
	Kuntu Toeroba	Riau	Kayu karet	Rubber tree *Hevea brasiliensis* (Muell. Arg.)	100d
	Jiat Kramat	Riau	Kayu campur	Species mixture	59
			Kayu medang kua	unknown	19
	Lumban Purba	North Sumatra	Kayu campur	Species mixture	54
	Kayu tusam	Sumatran pine		*Pinus merkusii* Jungh. & De Vr.	19
Marketable items	Belanti	South Sumatra	Karet	Rubber *Hevea brasiliensis* (Muell. Arg.)	58
			Petai	Parkia fruits Parkia speciosa (Hassk.)	18
	Bagan Tengah	Jambi	Karet	Rubber Hevea brasiliensis (Muell. Arg.)	46
			Duku	Duku fruits *Lansium domesticum* (Correa)	11
	Kuntu Toeroba	Riau	Karet	Rubber *Hevea brasiliensis* (Muell. Arg.)	72
			Jeruk	Oranges	22
	Jiat Kramat	Riau	Ikan tawar	Fish (from river)	61
			Ubi manggalo	Cassava	20
	Lumban Purba	North Sumatra	Kopi	Coffee (robusta)	50
			Tomat	Tomatoes	19

Note: All the PDM values represent the relative importance (in percentages) of one product within its use category. Products from different use categories therefore should not be compared on the basis of their PDM value.
a Shallot was only mentioned by one respondent.
b For cooking rice.
c For roasting fish.
d Including other wood species.

Table 10. Calculated land-use value per village

Province	Village	Average area/household (ha)	Land-use value (US$/ha per year) Total	Land-use value/household (US$/year)
South Sumatra	Belanti	3.94	349	1376
Jambi	Bagan Tengah*	2.78	469	1306
Riau	Jiat Kramat	1.78	721	1284
Riau	Kuntu Toeroba	4.79	332	1590
North Sumatra	Lumban Purba	0.87	731	633

* There was an additional US$4/ha worth of products coming from a forested area commonly owned.

DISCUSSION

This study was conducted because of the need to properly address the land claims issue and the poor adoption of C-C schemes in the HTI areas of Indonesia. Two important results emerged that can be adopted by the pulp-plantation companies to improve the acceptance of C-C agreements and to better manage and reduce the areas of land under conflict in HTI concession areas.

Effects of Community Development Investments on Present Claims

First, for all the cases studies (four of the five largest plantation companies in Sumatra), higher expenditure levels in Community Development programmes were related to larger areas of land affected by claims. The districts where more money had been spent on CD investments showed larger areas affected by claims at the time of study.

Although this result may sound counter-intuitive, it supports the field observations. It is not difficult to explain this result when large amounts of money are spent in small villages as a reactive way to solve problems and to try to avoid that additional area will be affected by conflicts. Payment of CD funds may be viewed by the people (villagers) as a chance of obtaining financial benefits by generating conflicts on the land. Additionally, infrastructure development (social, educational, roads, etc.) is a strong component of the CD programmes, encouraging people who had left their villages or forested areas (to look for a better life) to return. These investments generate the required incentive for them to claim their rights over lands (previously abandoned) falling under concessions.

Furthermore, some expenditure lines such as 'help for people', 'community support' and 'social expenses' are too loose to explain how the money is being spent. This leaves gaps for 'gifts' or 'pocket money' for the benefit of one or just a few members of the community. Thus, the money is spent without solving the land conflict issue for the community and rather creating the opportunity for further conflict.

Several products used for medicinal purposes are being obtained from the logged-over forests given in HTI concession (*Photo by Nicolas Hosgood*)

Farmers often visit the remaining forest areas for several resources important to their livelihoods (*Photo by Aditya Suhartanto*)

While this result does not support the reduction or elimination of CD expenses, it does highlight strongly a need for the companies to do some internal brainstorming to try to better understand the reasons and motivations for the claims in their HTI areas. Investment in CD could help in reducing land conflict if it is done in a way that targets specific solutions in each area, instead of simply giving the money away (as is done in part at present). A more detailed analysis at the company level will be required to assess the precise reasons why larger areas are affected by claims where more money has been spent. Nonetheless, these findings already point to the need for a proper rethink of the way the CD money is spent.

It is critical to ensure that we measure the influence of CD investments on the area under claims and not the opposite effect (area under claim influencing CD investments). For this reason, we related the total expenditure (not yearly expenditure) to the current total size of the area under claims. The result can then be read only in the stated direction, because we have used the present area under claims, which cannot have had an effect on former CD investments.

It is important to underline that the data used here for the first part of the research were provided by the companies themselves and we relied upon them totally. The main reasons for this are that plantation companies are the main target audience for adopting these research results and the lack of alternative sources of information. We considered that any distortions would be reflected in the whole data set in a similar way for the four plantation companies in the analysis.

Attaching Value to Forest Resources

The second result, referring to the variety of resources important for people's livelihoods and the associated value of the areas allocated for HTI development, is critical in developing a successful C-C scheme, which needs to take into account the importance that people attach to different areas and resources. Knowing which resources are important for the people, how important they are, and where they obtain the products from, can help companies to develop C-C schemes that are cost-efficient and that ensure better acceptance and long-term commitment.

While the common understanding of the companies' staff was that the remaining secondary forests, or *belukar*, areas in conflict were 'useless' areas for the people, with no further importance than the land and the few 'unproductive' rubber trees (where there were

Women cooking in the forest (*Photo by Philippe Guizo*l)

some), we found that such areas provide more than 300 products to the people who live in or near them. Understanding the importance of these areas and their resources to the local people, and attaching a proper value to them is essential for the companies targeting successful long-term agreements. Offering benefits far below the current benefits people perceive that they receive from the areas will only result in low acceptance and low commitment from the communities.

The calculated values of the HTI areas are much more than the benefits the people receive from planting pulp-purpose trees. The production fees offered by MHP to the MHBM scheme participants correspond to US$58/ha at the end of the rotation period, and the estimations of people's income[15] when joining the WKS scheme correspond to US$62/ha per year. Both of these figures are well below the present estimations of the value of the land to the people in the concession areas (US$349/ha per year for MHP and US$497/ha per year for WKS). Although no comparisons of offered and calculated land use values for the specific locations can be made, the large differences between them for a given concession area may explain the schemes' failure as long-term solutions. Few of these agreements have gone further than one rotation period (seven years).

Although the costs were not deducted from our estimations of the land value, we must remember that the main input corresponds to labour, which is provided by the members of the families and is not hired. The amount of money offered by the schemes should be based on the total amount calculated for the land value and should equate the labour requirements of participating in the schemes with the present requirements villagers have for cultivating or harvesting the current products in the areas. Such labour requirements should not be additionally remunerated, or labour-remuneration might be deducted from the original amount paid out in CD.

Because of the small number of products/resources with no substitutes in the local markets (from the people's point of view), the companies should encounter few difficulties in

[15] Total income from which all the costs have to be deducted.

offering money for the land use conversion of the areas in conflict, if they use the appropriate value.

The total value presented here corresponds to the valuation of the total area managed by the people, including the agricultural fields (*ladang*) and the forested patches (*kebun*), but the companies could calculate the value for each of the landscape units to determine the best option to be offered in the C-C agreements. The value per hectare to be offered in the agreements could be reduced if the agricultural fields (more intensively managed) are not converted into tree plantations. In that case, the companies must calculate the minimum size of land to be left aside for each villager and the distribution of those areas. The fertility of the land in question would be a critical factor in deciding the size of the areas to be left as agricultural fields, taking into account the need for replacing these fields and the frequency of replacement.

It is important to underline that the values calculated here represent the value of the areas in the specific villages included in the study and will not be representative of the entire HTI concession area of each company. Moreover, it is probable that the numbers (values) are at the higher end, because the forest areas chosen for the study represented those frequently used by the locals, which may be correlated with highly valued areas in the concessions. The methodology used here, based on people's perception, is useful for calculating the amount of money that should be offered in the C-C agreements, because it takes into account what the people obtain from a specific area and their own valuation of that. On the other hand and for the same reasons, the results presented would not necessarily be representative of a different area and different people. These values can be used as an estimate for comparison or as a value for the areas studied, but the companies should calculate the value of new areas to be included in C-C agreements. The methodology applied here represents a cheap, time-effective and feasible way for the companies to improve their understanding of the importance of the HTI areas to the local people and determine the value of such areas. It is a tool that can help the plantation companies in Indonesia and abroad to 'speak the same language' as the communities and design more successful C-C agreements targeting higher acceptance and longer-term commitments.

Other Issues

The **frequency of payments** is an additional element to be taken into account in the sustainability of C-C agreements. People in the villages have daily needs and daily requirements that they can address with the products extracted or harvested from the forested and field areas that they manage. Contracts offering financial returns only early and at the end of the seven-year rotation may be unsuccessful even if the amount of money offered is higher than the base value calculated (using the methodology above). Constant returns must be provided in the agreements to ensure their success. The total amount offered in the agreements should be divided across the total years of the rotation period, ensuring a constant source of income for the people.

The results of this study are novel in demonstrating the **importance of the logged-over HTI areas** for rural people as a source of livelihood. Our observations in the field confirmed that villagers, thanks to their knowledge and skills, can rely almost entirely on these local ecosystems (natural or anthropogenic) for their livelihoods. No former studies have shown the diversity of products obtained from these areas or determined their relative importance for the people and their associated value.

A former study (IPB 2000) calculated a regular income for the rural people in WKS areas of US$795 per household per year. This value is below (but not far below) the value calculated in this study—the difference is probably due to the different methodologies used and the fact that we have included the value of several forest products with no observable price, while the former study does not account for such values.

CONCLUSIONS

The results of this study show that high CD investments are not associated with reductions in the area affected with land claims. The districts in the HTI areas of the pulp-plantation companies in Sumatra where more money has been spent in the form of CD investments were also those with more area affected by land claims at the time of the study. Plantation companies need to analyse why this is happening and how to make use of the CD investments in a way that can reduce land conflict and claims.

The logged-over areas in concession for HTI development cannot be considered as 'empty' land—the resources obtained from these areas are numerous and cover a wide range of uses, and are important for people's livelihoods. Important products for the people corresponded to seven use categories and were obtained from both agricultural fields and forested areas.

The estimated value of land per hectare per year for the HTI areas ranges from about US$350 to US$700 depending on the type of area considered. These figures are several times larger than the amounts currently offered by the companies' schemes as profits for planting pulp-wood trees. This may explain why the plantation companies are encountering difficulties in convincing local people claiming land rights to convert their present land use of the areas.

Most of the products or resources could be found in the local market or associated with a market substitute, making it feasible to use a monetary value for compensation. This would suggest that the local people would be willing to accept money for the areas of land and resources that currently support their livelihoods, thereby allowing the companies to convert the land use for the benefit of both companies and communities, if the proper compensation is calculated.

The value calculated here, for the areas in the HTI concessions, is based on the current use of the areas as the 'best alternative use' of the land. No comparisons with any other productive use, such as oil-palm plantations, were made. The reason is that we were valuing areas inside the concessions, which are not legally convertible to alternative productive uses other than for the development of pulp-wood plantations. Therefore commercial oil palm, rubber or coffee plantations are not considered as alternative uses for these areas of land.

RECOMMENDATIONS

To properly resolve land conflict issues, companies must better understand the motivations that led to the conflict in each specific area. Applying the methodology used in this study, companies can increase their understanding of the community and their motivations, and use this information to redirect CD investments in a way that will help reduce conflict-related costs.

It is also important to better understand the reasons why higher CD expenditure is related to larger areas under claims. Plantation companies should determine the elements of the CD expenditure that reduce, or could reduce, land claims and promote those, eliminating from the CD programme the elements that have the opposite effect. An additional regression could be done relating the area under claims with each of the different budget lines of the CD programmes, such as in the following example:

$$LC_k = \beta_0 + \beta_1 \text{Agriculture}_k + \beta_2 \text{Help for People}_k + \beta_3 \text{Education}_k + \beta_4 \text{Community support}_k + \beta_5 \text{Infrastructure}_k$$

(Where k represents each of the districts.)

And the companies could do this for a larger number of smaller areas using, for instance, forest clusters instead of political districts (kabupatens) to obtain more detailed and stronger results.

Another possibility would be to test whether CD expenditures have reduced the area affected by claims, by using the changes in the area affected by claims for different years and determining the proper lag to be used in the function:

$$(LC_{t-1} - LC_t)_k = (\beta_0 + \beta_1 \text{Agriculture}_{t-1} + \beta_2 \text{Help for People}_{t-1} + \beta_3 \text{Education}_{t-1} + \beta_4 \text{Community support}_{t-1} + \beta_5 \text{Infraestructure}_{t-1})_k$$

(Where t is time, e.g. years.)

Companies in Indonesia could also differentiate for time periods, dividing the sample into the time before and after 1998 or before and after CD policy changes, and measure whether there is a difference in the results for the different time periods. This would help to see the current effects of CD investments on the reductions in the area affected by claims and to test the effectiveness of new policies.

Such results would help in discriminating the variables that are having positive and negative effects on the reduction of the areas affected by claims and help in establishing a company's new policy on CD programmes. The companies could reallocate the money from the variables that are 'promoting' land claims to the variables that are 'reducing' them, or use that money to increase the amounts offered in the C-C schemes.

If they want to improve schemes' acceptance, companies must increase the benefits people receive for their participation in the schemes, taking into account the opportunity cost of the land for each specific area.

The risks associated with land use changes from a diverse to a monoculture system have not been analysed here. Although most of the products could be found in the local markets or people acknowledged that they had a market substitute, some of the uses may not have been expressed and may not have a market substitute. More in-depth analysis must be done to ensure that villagers can address critical needs after the land use conversion as well as they did before it. The risks associated with the market have not been analysed either; the pulp wood can only be sold to the monopsonic (dedicated) mills in the areas; if any of those mills closed, the people would have no market for the pulp trees planted in their areas and would have to bear the costs associated with the new land use conversion. Some of the plant species might have been totally lost from the areas or would take a long time to re-establish after several rotations of plantations (mainly Acacia spp.). These risks should be taken into account when developing the schemes, and the people must understand the significance of those risks, agreeing on strategies and commitments from both parties to reduce them. This will be crucial when targeting long-term commitments (FAO 2002).

Problems associated with the probable increases in price for the products for which the demand in the local markets would increase have not been considered here. Companies must take this element into account to appropriately calculate the benefits to be offered to the communities to ensure long-term success of the agreements.

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ANNEXES

Annex I: Household Questionnaire 1

INSTRUCTIONS:

1. ONE SHEET FOR EACH HOME INTERVIEW
2. CHOOSE ONE RESPONDENT FOR EACH HOME (MAN OR WOMAN)
3. TRY TO HAVE AS MANY WOMEN RESPONDENTS AS MEN FOR THE VILLAGE
4. INITIATE WITH A PROPER INTRODUCTION OF THE RESEARCH, RESEARCH PURPOSE AND POSSIBLE RESULTS
5. EXPLICITLY MENTION THE AREA WE ARE TALKING ABOUT (Use the name given by the *Kepala Desa* or explain that we are talking about the area (_____hectares) managed by the community)

MEETING WITH THE *KEPALA DESA* OR COMMUNITY LEADER:
NAME:
AGE:
GENDER:
YEARS LIVING IN THE VILLAGE:
NUMBER OF FAMILIES IN THE COMMUNITY:

Questionnaire 1: PDM most important species per use category (*PDM jenis yang paling penting per kategori guna*)					
Respondent		Date day/month/year		/	/
Group of origin		Area managed/owned by the respondent (ha)			
Years living in the area		Name of the village			
Age		Written by			
Sex		Other notes			

For each of the use categories, ask the respondent to think of the products they obtain from the community areas and agree on which are the most important (up to 10). Draw cards for each of the mentioned products and distribute 100 pebbles to show the relative importance for each product (separately for each use category). Indicate in 'remaining' how important the remaining unlisted species or categories are compared to the ones already listed (sum of all those listed already = 100)

	MDP general		MDP general		MDP general		MDP general
Food		**Medicine**		**Light construction**		**Heavy construction**	
Plants/Animals		**Plants/Animals**					
Plant/Animal names	**MDP**	Plant/Animal names	**MDP**	Plant names	**MDP**	Plant names	**MDP**
Total MDP = 100?							
Remaining		Remaining		Remaining		Remaining	

	MDP General		MDP General		MDP General		MDP General
Tools		**Firewood**		**Basketry**		**Ornaments / Ritual**	
Plants/Animals		**Plants**		**Plants/Animals**		**Plants/Animals**	
Plant/Animal names	MDP	Plant names	MDP	Plant/Animal names	MDP	Plant/Animal names	MDP
MDP Total = 100?							
Remaining		Remaining		Remaining		Remaining	

	MDP General		MDP General		MDP General		MDP General	Sum=100
Marketable products		**Hunting function**		**Hunting place**		**Recreation**		
Plants/Animals		**Plants/Animals**		**Plants**				
Plant/Animal names	MDP	Plant/Animal names	MDP	Plant names	MDP			
MDP Total = 100?								
Remaining		Remaining		Remaining				

Annex II: Household Questionnaire 2 - Valuing the products

Mention each of the listed products above (one by one) and ask:

					Can you obtain this product from another area?					
Category	Product	Amount used	Selling price	Market substitute	Distance	Time distance	Transportation	Payments/trip		Other costs*
		(unit/year)	(Rp/unit)	(Rp/unit)	(km)	(hours)	(type)	Item	(Rp/trip)	

* Costs that cannot be measured in monetary terms, e.g. if the daughter cannot go to school because she has to take care of the baby while the parent goes to look for the product in the new area.

Annex III: Local Market Items and Prices

Data sheet: Price of traded goods (*HARGA JUAL BARANG*)	***Interview 3-5 shopkeepers***				
Respondent		Date day/month/year		/	/
Village		Written by			

INSTRUCTIONS: Add to this list all the items/products that the people mentioned as possible market substitutes for the products they currently obtain from the forested areas. This data sheet shall be filled once we have interviewed all the families in the village using questionnaires 1 and 2.

Questions (*Pertanyaan*)	**Answers (*Jawaban*)**		
What are the prices of following food/products? (*berapa harga jual barang/produk berikut*?)	Unit	Price (Rp)	Remarks (*Keterangan*)
1. Rice (*beras*)			
2. Flour (*tepung*)			
3. Cooking oil (*minyak goreng*)			
4. Kerosene (*Minyak tanah*)			
5. Sugar (*gula*)			
6. Salty fish (*ikan asin*)			
7. Cloth (*Kain*)			
8. Tea (*Teh*)			
9. Coffee (*Kopi*)			
10. Gasoline (*Bensin*)			
11. Diesel fuel (*Solar*)			

12. Instant noodles (*Mie instan*)			
13. Sardines (*Sarden*)			
14. Battery (size D – big) (*Batere ukuran D-besar*)			
15. Soap (*sabun mandi*)			
16. Detergent (*Sabun cuci/deterjen*)			
17. Cigarettes (*Rokok*)			
18. Rope			
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Medicines (*Obat-obatan*)			
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This study looks at two important fast-wood plantation issues in Indonesia, the impact of land claims and the role of partnership schemes. The study was conducted in collaboration with some of the nation's largest plantation companies. Land claims have a significant impact on plantation companies and continue to affect a sizeable land area, despite the many years and costly efforts of companies to reduce the size and number of these claims. Partnership schemes have achieved very modest results, with many communities preferring not to participate in planting fast-wood trees. This document examines land claims using historical data. It also details the use by communities of a recently developed 'participatory' method to bring light to these issues. Although the data and analysis is focused on Indonesia, the conclusions may be applied to similar situations in other tropical countries and help improve the ways companies and communities co-exist and engage with each other.

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