

**For better or for worse? Local impacts of the decentralization of Indonesia's forest sector**

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**Abstract:** This paper quantifies the local impacts of mechanised logging on forest-dependent communities in Indonesia, before and after decentralization. A conceptual framework incorporates financial, social, enforcement, rent-seeking and environmental impacts. Based on the perceptions of respondents from 60 communities in East Kalimantan, the empirical results suggest that significantly more households received financial and in-kind benefits after decentralization compared to before. Many communities engaged in self-enforcement activities against firms both before and after decentralization, while a significantly higher proportion of households perceived community forest ownership in the post-decentralization period. The majority of households perceived no significant differences in environmental impacts. Finally, there is little evidence of a post-decentralization trade-off between environmental and financial contractual provisions.

**Keywords:** Asia, Indonesia, decentralization, impacts, communities, self-enforcement, logging, trade-offs

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## **I. Introduction**

Over 60 countries worldwide have, over the last few decades, decentralized some aspect of natural resource management (Agrawal, 2001). Decentralization is defined as a transfer of powers from central government to lower levels in a political-administrative and territorial hierarchy (Agrawal and Ribot, 1999). During Asia's economic crisis, the fall of President Suharto in 1998 precipitated 'Big Bang' decentralization in Indonesia, moving the country from being one of the world's most centralized countries to one of its most decentralized (Hofman and Kaiser, 2002).

As detailed in section 2 below, decentralization of Indonesia's forest sector resulted in newly-empowered, forest-dependent communities exerting property rights over customary forest, although mostly without formal legal title. Consequently, many communities that had already been involuntarily exposed to logging before decentralization, engaged in direct negotiations and made legalized agreements with logging firms in exchange for financial and in-kind benefits after decentralization. The objective of this paper is to quantitatively assess the impacts from mechanized logging on communities before and after decentralization.

In theory, decentralization can increase both efficiency and equity in natural resource management, although these benefits are more likely to arise from the presence of democratic processes that encourage local authorities to serve the needs of their constituents (Ribot, 2002)<sup>1</sup>. Decentralization as defined here usually implies a top-down process, although development that includes local empowerment depends on bottom-up processes (Chambers, 1997). Greater local-level participation in natural resource management has been promoted by researchers, NGOs and international organisation as means of improving at the minimum, local management outcomes (Ribot, 2003). Of greatest concern to communities are equity and democracy considerations, specifically, a greater control over livelihoods and a greater share of natural resource benefits (Edmonds et al., 2003).

Community-level management can have ecologically and socially positive effects, for instance in generating revenues for local public developments (Ribot, 2004). Larson and Ribot (2004) document cases of decentralized natural resources that have been effectively managed by local communities. But as Ribot (2004) notes, these project-based approaches occur under close outside supervision and with intensive assistance. Thus, these experiences may not reflect what might occur in a more generalized decentralization setting. Kaimowitz et al. (1998) argue that there is in fact little evidence that forest sector decentralization has benefited forests and the people who depend on them.

Casson and Obidzinski (2002) found that Indonesian communities have benefited, at least financially and in the short-term, from the post-decentralization, mechanized concessions regime compared with the situation before. Resosudarmo (2004) considers the overall effects of decentralized forest management including ecological impacts to be undesirable, with 'mixed' impacts on communities (p.126). Nevertheless, local people gained access to forest resources and increased formal recognition of their forest claims. Edmonds and Wollenberg (2003) stress, however, that it is important to understand what existed previously in order to place the impacts of decentralization on communities in context. Building on these qualitative case studies, this paper contributes to the literature with a quantitative and systematic assessment of decentralization impacts using data collected from a large sample of communities in a single Indonesian province.

A conceptual framework is developed in section 3, incorporating five categories of impact: financial, social, enforcement, rent-seeking and environmental. Two of these categories, enforcement and rent-seeking, have not been explicitly considered before. Using data taken from a survey of 65 communities in the province of East Kalimantan, in section 4, we analyze whether there are any significant differences between the impacts of centralized and decentralized systems of mechanized logging concessions on local communities. These data are based on respondents' perceptions on the impacts of logging. In this section, we also

contribute to the literature by examining the evidence for any trade-offs between environmental and financial provisions in post-decentralization agreements. In addition to investigating the choices that communities made in their negotiations for logging agreements, ones they did not have before decentralization, these trade-offs may also help explain the patterns in post-decentralization financial and environmental outcomes. Section 5 synthesizes the results and section 6 concludes.

## **II. Background**

Under President Suharto in the 1960s, Indonesia's forests, covering at least 40 per cent of the country's land area, were placed under central government control (FWI/GFW, 2002). Small-scale timber harvesting permits (for manual logging) were issued by local governments to smallholders during this time. From 1970 onwards the central government granted large-scale permits known as HPH<sup>2</sup> to firms directly (Ross, 2001). Forest cover declined from 162 to 98 million hectares from 1950 until 2000 (FWI/GFW, 2002). This decline was at least partly due to the expansion of commercial, mechanized logging (World Bank, 2000). Legal small-scale logging was curtailed by central government in 1971<sup>3</sup>, and firms' harvesting rights were given precedence over customary forest rights whenever the two were in conflict (Ross, 2001). Around 20 million people are estimated to live in or near natural forests (Sunderlin et al., 2000). People were resettled away from forest areas, and had restrictions placed on their forest uses (Lindayati, 2001). The police and army enforced restrictions and protected HPH concessions (Casson and Obidzinski, 2002). State forestry laws consequently had little legitimacy in the eyes of local people (FWI/GFW, 2002).

The commercial, mechanised exploitation of forest resources was a significant factor fuelling Indonesia's rapid, though unsustainable economic development from the early 1970s until 1997 (FWI/GWF, *ibid*). Beginning in 1997, the Asian economic crisis (*krismon*) affected Indonesia more strongly than any other country in the region, devastating rural livelihoods

(Sunderlin et al., 2000). Moreover, it severely affected the forest sector, including the profitability of many HPH firms (Casson and Obidzinski, 2002). The crisis was accompanied by related social and environmental upheavals, leading to the demise of the Suharto regime in 1998 (Forrester and May, 1999). At this time, there were widespread demands for political, administrative and economic reforms, commonly and collectively known as *reformasi*.

A political and administrative transformation of Indonesia took place, which gave greater decision-making powers to local governments (Resosudarmo, 2004). In 1999, a new forestry law established the category of 'customary forest', although the legal definition of community rights to forests remained weak (Wollenberg and Kartodihardjo, 2001). The decentralization of the forest sector was, however, a *de facto* process due to local people making decisions in a vacuum left by the loss of central government authority in 1997-98. Hence, *de facto* decentralization occurred faster than *de jure* decentralization (Resosudarmo, 2004). In this paper, 'post-decentralization' will refer to a time period including *reformasi* as well as the formal implementation of decentralization laws, i.e. including all events from 1997-98 until the study period, 2003-04; 'pre-decentralization' will refer to the Suharto period, 1966-97.

The new forestry law allowed district heads to issue timber harvesting permits known as IPPK and HPHH<sup>4</sup>. Following the increase in community forest claims, logging brokers approached and negotiated small-scale logging agreements with communities. Hundreds of these permits were issued by district heads (Casson and Obidzinski, 2002). The new system enabled many timber brokers, already embedded in local illegal logging networks, to expand and mechanize their operations (Limberg, 2004). Consequently, these brokers had their businesses 'legitimised' (Casson and Obidzinski, 2002). In order to expand operations, brokers instigated collaborations with capital owners and timber buyers, forming working partnerships (hereafter called 'firms'). In comparison to manual logging activities, these mechanised operations were able to harvest far higher production volumes and hence,

generate larger cash payments in a given period of time. So while communities derived up to two-thirds *less* in IPPK/HPHH fees per cubic metre (m<sup>3</sup>) compared with manual logging, they tended to receive more money overall (Obidzinski, 2004)<sup>5</sup>.

Due to many IPPK/HPHH concessions apparently falling within the boundaries of HPH concessions (e.g. Barr et al., 2001)<sup>6</sup>, the Ministry of Forestry (MoF) suspended the authority of districts to issue IPPK/HPHH permits in 2000. However, many districts refused and justified their position based on differing interpretations of conflicting laws and regulations, continuing to issue permits at least until 2003 (Palmer, 2006). The MoF estimated the total area of forest allocated for IPPK/HPHH concessions by district governments since the system was established, to be around two million hectares in January 2003 (Resosudarmo, 2004).

### **III. Conceptual framework**

In this section, the conceptual framework is presented, based on the following categories of decentralization impact: financial, social, enforcement, rent-seeking and environmental. Overall, we expect that both post-decentralization costs and benefits would be higher than those before decentralization. The challenge of the research is partly to understand which of these two (benefits or costs) predominated.

#### **III.1 Financial impacts (financial and in-kind benefits)**

Until 1997-98, the financial benefits from large-scale, mechanised logging<sup>7</sup> flowed largely to the Suharto family and its patrons (Brown, 1999). Local people living in, or around, HPH concessions received ‘very little’ in terms of cash or in-kind developments from firms before decentralization (Casson and Obidzinski, 2002: 2135). This was despite government regulations mandating that firms establish rural development programmes<sup>7</sup>.

Post-decentralization, in exchange for providing access to commercially valuable timber to firms, communities typically negotiated production-based fees per m<sup>3</sup> of timber

produced, and in-kind benefits (Casson and Obidzinski 2002; Barr et al. 2001). In-kind benefits varied from the building of schools to the provision of seeds. Many communities also negotiated firm employment<sup>8</sup>. Casson and Obidzinski (2002) note that these benefits were ‘much more than local people were able to obtain during the Suharto era’ (p. 2142).

There is a need to distinguish between negotiated and actual payments, which could be potentially quite different due to enforcement problems. Thus, the appropriate measure to be used here is the actual payments received by communities. As table 1 shows, significant differences are expected between financial and in-kind benefits flowing to communities when comparing the pre- and post-decentralization regimes: zero financial benefits and zero to ‘some’ in-kind benefits received before decentralization (this benefit range denoted by ‘0/+’), and; ‘some’ financial and in-kind benefits received after decentralization (denoted by ‘+’). Hence, it is expected that:

- Financial benefits to communities increased with decentralization (I).

Empirically, financial and in-kind benefits received can be observed on the basis of the value of monies received plus the value of in-kind developments, per community (or household, or person). A lack of precise information means that in-kind benefits are valued on the crude basis of the cost of provision only. Employment in the community, where provided, can be valued on the basis of the number of employees, the wage rate and the length of employment. Alternatively, the proportion of households in a community that received financial benefits and/or in-kind benefits could proxy for benefits received in the absence of more precise data.

### III.2 Social impacts (empowerment)

IPPK/HPHH concessions tended to employ mechanised methods of exploitation and operated on a larger scale than the non-mechanised concessions of 1967-71. Collaboration with brokers and contractors led Resosudarmo (2004) to argue that this resulted in less control and empowerment at the local level than people were expecting. Nevertheless, Resosudarmo

underestimated the impact of these interactions on communities' perceptions of their forest rights. Thus, direct negotiations between communities and firms along with the permits issued by local governments were a tangible acknowledgement of customary rights. We attempt to measure the sense of empowerment from these by tracking perceptions of forest ownership<sup>9</sup> from the pre- to the post-decentralization periods. It is expected that:

- The perception of community forest ownership and, in this narrow sense, empowerment, increased with decentralization (II).

### III.3 Enforcement costs

#### i. Enforcement *vis-à-vis* the firm

Many conflicts between communities and HPH firms began in 1997-98 when people were becoming more aware of the economic and political realities of the period (Sudana, 2004). Prior to this period, direct actions against firms were relatively rare because communities were afraid; when people did protest, the police and military tended to intervene on the side of the firm, sometimes using force against communities (FWI/GFW, 2002).

Post-decentralization, communities were vulnerable to firms' failure to comply with agreements (Casson and Obidzinski, 2002). The government's weak enforcement capacity, coupled with vaguely defined property rights implied that forest rights could be claimed either by communities or firms (Engel, López and Palmer, 2006). For firms, this usually took the form of making promises that were not complied with later (Barr et al, 2001).

Communities quickly learnt how to deal with IPPK/HPHH firms, particularly after direct reporting to firms and the local government yielded few results (Limberg, 2004). When other approaches had been exhausted, communities sometimes undertook direct actions against firms such as demonstrations and road blocks. The success of community self-enforcement actions may have depended on a community's ability for collective action (Palmer, 2004; Engel and Palmer, in press). Longer, credible actions may have required



greater collective action within the community and hence, higher levels of household participation, support and organization. Coordination and leadership was usually, but not always provided by community leaders. Direct methods and strategies to enforce agreements imply relatively high opportunity and transaction costs for communities. It is expected that:

- Enforcement costs of blockading to communities increased with decentralization (IIIa).

Empirically, community-firm conflicts can be observed on the basis of the proportion of households in the community participating in an enforcement activity, the nature of the activity and the amount of time the activity consumed.

ii. Enforcement *vis-à-vis* other communities

Economic incentives from community-firm agreements intensified conflicts among communities. There was a dramatic increase in competition over resource claims facilitated by the weak legal basis for community boundaries and forest resource rights (Barr et al., 2001). Sudana (2004) describes how the increase in post-decentralization forest-related conflicts among communities, while rooted in historical relationships among settlements and ethnic groups in the area, was at least partly influenced by the proliferation in agreements. As more communities entered into these agreements, they became more vigilant about delineating community forest borders and enforcing these (Casson and Obidzinski, 2002).

Typically, an inter-community conflict involved the firm working on behalf of, and benefiting one of the communities (see for example, Iwan, 2004). Matters would then either be resolved through negotiation or the conflict would continue, although these kinds of conflicts tended not to be resolved so easily, with possible consequences for inter-community relations<sup>10</sup>. While many of these conflicts have historical origins, these were not necessarily the result of HPH logging before decentralization. Therefore, there were no enforcement costs from these conflicts at that time (denoted by '0' in table 1). It is expected that:

- Enforcement costs from inter-community conflicts increased with decentralization (IIIb).

Empirically, inter-community conflicts can be observed on the basis of the proportion of households per community citing problems with neighbouring communities, the types of problem and whether or not they derived from post-decentralization concessions.

#### III.4 Rent-seeking impacts

There is anecdotal evidence that some groups undertook actions such as road blocks against firms independent of others within the same community, even when the firm had complied (at least partially) with the agreement (Limberg, pers. comm., 2003). These rent-seeking actions (known hereafter as ‘opportunistic blockading’) were generally short-lived and the payoffs relatively small, leading to intra-community conflicts. They may also have given firms disincentives to comply further with agreements made.

In developing countries where there is serious corruption at both the local and national levels, decentralization may allow more local elites to participate in rent-seeking activities<sup>11</sup> (Larson, 2004). Should decentralization lead to the capture of rents by local elites, it may stymie the equitable distribution of these rents (Carney, 1995). Post-decentralization community-firm logging deals spread the culture of rent-seeking from well-established local timber networks consisting of government officials and business elites, leading to the cooptation of community elites, a trend that was apparently widespread<sup>12</sup> (see for example, Barr et al., 2001).

Rent-seeking by elites took two forms. First, the firm may have complied with at least some of its payments, which were not subsequently distributed by community leaders. Instead, these were captured by the leaders who then blamed the firm for non-compliance when other community members complained about not receiving their share of payments. Hence, community-firm conflicts might have occurred even when the firm was in partial

compliance with the agreement (hereafter denoted as ‘useless blockading’). At some stage though, people usually realized that their leaders were capturing rents, and instead of blaming the firm, would accuse the leaders of wrong-doing. Second, elite rent-seeking involved leaders accepting ‘special fees’ from the firm in exchange for allowing the firm to avoid compliance with some or all of its contractual obligations. The firm would expect the leaders to try to undermine the community’s willingness and ability to self-enforce contracts (see for example, Suramenggala et al., 2001). In either case, intra-community problems are expected to occur where elite rent-seeking has taken place, which may lead to less incentive for households to engage in collective action should the firm then decide not to comply further with its contractual obligations<sup>13</sup>.

In this framework, it should be noted that while intra-community rent-seeking is not necessarily caused directly by firm behaviour, it is related to the responsibilities of communities in making these agreements and as such did not occur prior to 1997-98. Thus, in this sense they are an impact of decentralization; people use up resources in order to seek rents<sup>14</sup>. Hence, rent-seeking can be considered an ‘unproductive activity’. It is expected that:

- Unproductive activity costs to communities resulting from rent-seeking increased with decentralization (IV).

To empirically distinguish ‘true self-enforcement’ activities against firms from ‘opportunistic blockading’ and ‘useless blockading’, three criteria are adopted:

1. Occurrence of non-compliance by the firm. If there is no evidence for non-compliance but blockading by the community still occurs, then it cannot be ‘true self-enforcement’;
2. Intensity of intra-community conflict. If there is a high intensity of intra-community conflict, then this is more likely to be due to opportunistic or useless blockading, hence indicating rent-seeking within the community.
3. Household participation in community-firm conflict. Lower household participation in community-firm conflict indicates a greater likelihood of opportunistic behaviour.

### III.5 Environmental impacts

Mechanized logging requires the building of roads through forests and the use of heavy equipment, typically leading to widespread forest damage (Ross, 2001). According to Ross, the MoF barely regulated HPH firms, which violated the reforestation regulations with impunity before decentralization. Casson and Obidzinski (2002) describe how HPH firms long harvested timber over the maximum ‘approved’ level and obtained timber from ‘illegal’ sources in order to meet demand. This resulted in erosion, flooding, and drought (FWI/GFW, 2002). These environmental consequences have not taken very long to impact on local communities (see for example, McCarthy, 2000).

After decentralization, large numbers of IPPK/HPHH permits were issued prior to the establishment of a regulatory agency at the local level (Barr et al., 2001). Thus, local governments failed to regulate or monitor the environmental performance of IPPK/HPHH operations (Casson and Obidzinski, 2002; Resosudarmo, 2004). Iskandar et al. (cited in Wollenberg, 2004) found that IPPK firms harvested greater volumes of timber per hectare than HPH firms resulting in more forest degradation.

Barr et al. (2001) concluded that the pattern of forest degradation under decentralization is no different from what it was under centralised management. Overall, it seems that the environmental impacts from IPPK/HPHH concessions were at the minimum similar to and possibly worse than impacts under the centralised system especially for those concessions situated in recently logged-over areas. Table 1 captures some of these costs as a loss of ecological services. Due to data limitations we confine ourselves to local impacts only<sup>15</sup>. The expected direction of effect in the short-term ranges from zero to negative (denoted as ‘0/-’ in table 1). It is expected that:

- Ecological costs to communities neither increased nor declined with decentralization (V).

Empirically, perceptions of environmental damages can be elicited by asking households whether or not there have been any changes in selected environmental indicators, both before and after decentralization, and why these changes might have occurred.

While it is clear that local governments did not and perhaps could not regulate the environmental performance of IPPK/HPHH concessions, there has been relatively little research on the role of communities in effecting changes in the pattern of forest degradation from mechanised logging. Resosudarmo (2004) contends that communities were more concerned with immediate economic need rather than long-term forest management. This may be because communities had little confidence that their new rights would last given political uncertainties. However, some communities have been observed to shape their agreements to minimise some of the local impacts, for example by negotiating for the location of concession areas and the tree species to be harvested (see Palmer, 2004). Trade-offs in contractual provisions are investigated further in the following section.

#### **IV. Empirical analysis**

##### **IV.1. Fieldwork and data**

Fieldwork was undertaken in East Kalimantan province, with community- and household-level surveys in 65 communities<sup>16</sup>. Of the sample, 60 communities had experienced both commercial, mechanised large-scale concessions (involuntarily) before decentralization in 1997-98, and had negotiated mechanised, IPPK/HPHH concessions post-decentralization. The main unit of measurement used in this paper is the community, defined as a group of people with a single agreement that was negotiated for the benefit of all members of the group. Some agreements were shared (see Palmer, 2006). Thus, when analysing contractual trade-offs the unit of measurement is an agreement of which there are 55 in this sample.

The community- and household-level surveys contained similar sections on pre- and post-decentralization logging experiences. Questions included benefits received, perceptions

of and participation in conflicts, along with perceptions of environmental damage costs. More details are given in the relevant sections of this paper. The community-level survey was the more comprehensive one of the two and designed to capture specific responses from group discussions involving community leaders; they were typically the community members who represented the community in negotiations. The responses of other community members, not directly involved in negotiations, were captured using the household survey. This was primarily designed to assist in corroboration and cross-checking of responses given by the leaders. Depending on the size of the community, between five and 20 households (average, 10 households) were randomly sampled in each. Sampling was undertaken on the basis of household lists held by the 'village office', and according to household ethnicity and income levels (see Palmer, 2006).

## IV.2. Empirical results

### *IV.2.1. Financial and in-kind benefits*

The data are analysed for statistical differences between financial and in-kind benefits received by households before and after decentralization. Data for absolute or production-based levels of benefits received by households before decentralization were either unavailable or unreliable. Instead, the differences between the proportions of households within each community claiming to have received benefits before and after decentralization are analysed. After decentralization, all communities negotiated for and received some financial benefits. The percentage of households per community that received financial benefits significantly increased from an average of 1 percent before decentralization to over 90 percent afterwards. 37 communities (62 percent of the sample) negotiated in-kind benefits, not including employment, after decentralization. Thus, for these 37 communities only, perceptions in the provision of in-kind benefits also increased significantly, from 11 percent

to 18 percent of households per community. Unfortunately, a lack of meaningful survey data on household employment excludes these from further analysis<sup>17</sup>.

Only eight communities received any benefits before decentralization. Post-decentralization, these communities received an average of IDR 19,455 (USD 2.16)<sup>18</sup> per m<sup>3</sup> (including the value of in-kind developments), a figure which compares unfavorably with the average for the whole sample, IDR 33,055 per m<sup>3</sup> (USD 3.67). So while the remainder of the sample received no financial benefits from logging before decentralization, this seems to have had little impact on financial benefits levels received afterwards. It should be noted, however, that some communities in this sample benefited a lot more than others with payments received ranging from IDR 2,500 (USD 0.28) to IDR 106,322 (USD 11.81) per m<sup>3</sup>.<sup>19</sup>

#### *IV.2.2 Social impacts - empowerment*

‘Community empowerment’ is measured by investigating whether experiences in making IPPK/HPHH deals had shifted peoples’ perceptions of forest ownership over time. Households were asked ‘who owned the forest?’ before and after decentralization.

The results show that perceptions of forest ownership changed dramatically from the pre- to the post-decentralization era. The proportions of households claiming that the community owned the forest (either alone or in conjunction with other institutions) significantly increased from 25 percent before decentralization to 94 percent afterwards. Moreover, the percentage of households saying ‘government’ alone dropped significantly from 40 percent to just three percent, while those stating ‘logging firms’ in conjunction with the government also significantly dropped from 20.1 percent to zero. Households stating firms alone significantly fell from 11.1 to 0.3 percent.

### *IV.2.3 Enforcement costs*

#### *IV.2.3.1 Community-firm conflicts*

Before decentralization, 25 communities in the sample (42 percent) engaged in activities against HPH firms. Of these, only four also received some form of compensation from firms.

Post-decentralization, 40 communities (67 percent) reported having problems of non-compliance with their respective IPPK/HPHH firms. Many communities reported multiple problems rather than a single problem of non-compliance. Overall, the lateness or non-payment of fees was the most common problem with 53 percent of those communities reporting problems, followed by the failure to replant logged forests (37 percent) and the non-provision of in-kind benefits contained within the agreement (33 percent).

Of these, a further 26 (43 percent of the total sample, and 65 percent of those reporting problems in the community surveys) undertook one or a combination of actions against firms: 18 undertook demonstrations, 16 confiscated equipment, two blocked roads and two confiscated timber. Where action was taken, communities claimed to have stopped firm activities in half of these cases. 11 out of these 26 cases where action was taken experienced conflict with firms before decentralization as well. Of the 25 pre-decentralization conflict cases, 14 (56 percent) reported no serious problems with their respective IPPK/HPHH firms necessitating direct action after decentralization. Thus, there seems to be little evidence linking experiences of actions taken pre- and post-decentralization. Moreover, contrary to what was expected, there were almost equal proportions of communities in the sample involved in enforcement actions before and after decentralization. Therefore, enforcement costs were incurred by communities before decentralization even though these activities were not necessarily successful in claiming compensation from HPH firms.

Overall, an average of 34 percent of households per community participated in actions against IPPK/HPHH firms, compared to 18 percent before decentralization. Possibly, greater community empowerment after decentralization and the acknowledgement of community



rights made people less afraid to participate in actions against firms. In section IV.2.5, we attempt to distinguish ‘true’ enforcement activities from ‘opportunistic’ and ‘useless’ blockading.

#### IV.2.3.2 Inter-community conflicts

From the community-level surveys, 33 communities (55 percent) reported having one or more problems with other communities. Of these, 30 (91 percent) reported conflicting forest claims; nine reported logging impacts from other communities’ firms (27 percent); seven reported problems over logging payments (21 percent); and, seven reported problems with firm transgressions over borders (21 percent) as a cause of inter-community conflict.

As with the other types of conflict, the relative levels of conflict are difficult to gauge, although there seems to be little evidence of actual violence between members of different communities. A measure of the intensity of these conflicts is derived from household responses. Where problems were less likely to have been resolved and of greater severity, a higher rate of recall is expected in those cases compared to communities where the problems were minor or had been resolved already. A majority of households (i.e. 51 percent or more) indicated problems with neighbouring communities in 28 communities, or 47 percent of the sample. This compares with the 33 community-level responses indicating such problems. However, it should be noted that in only nine cases (15 percent of the sample), did zero households indicate that there were no inter-community problems whatsoever. By comparison in 27 community-level responses (45 percent of the sample), community leaders indicated that there had been no inter-community problems<sup>20</sup>.

#### IV.2.4 *Rent-seeking costs*

In 21 cases out of 60 (35 percent), community leaders reported intra-community problems, typically complaints about the distribution of fee monies within the community. Since many

leaders were understandably reluctant to discuss problems within their own communities, a similar question was asked of households on problems relating to the distribution of rents.

In only 13 cases (22 percent of sampled communities) did no households complain at all. In 32 cases (53 percent), a majority of households (i.e. 51 percent or over) indicated distributional problems within their respective communities. Of these 32 cases, 100 percent of sampled households indicated such problems in only seven communities. 19 of the 21 communities that indicated intra-community problems in the community survey also had household response rates of 51 percent or more indicating such problems.

There are difficulties in comparing problems among communities in terms of severity and the difficulties in corroborating responses. Nevertheless, the fewer people who responded to this question in the affirmative, the less likely those problems were serious, unresolved or had long-lasting impacts.

#### *IV.2.5 'True' self-enforcement', 'opportunistic' or 'useless' blockading?*

We attempt to empirically distinguish 'true' community self-enforcement activities against firms from 'opportunistic' and 'useless' blockading. 'True enforcement' is a community response to firm non-compliance, while an 'opportunistic' activity is one undertaken by rent-seeking community members when the firm has at least partly complied with its agreement. 'Useless' blockading may also occur when the firm is in compliance; in these cases rent-seeking community leaders preferred to keep the benefits for themselves and blamed the non-distribution of these to the wider community on firm 'non-compliance'.

To identify 'true' enforcement actions, data for the intensity of intra-community conflict are combined with data for firm compliance and household participation in community-firm conflicts, as shown in figure 1. 'Compliance' is a discrete variable defined as a contract that has not been broken by the firm, as noted by community leaders. Table 2 shows how we attempt to distinguish among the different types of blockading.

Beginning with the 20 cases where firms complied with the agreements (as reported by community leaders), 17 of these are located in the lower-left quadrant. As expected, there was no (participation in) blockading, in addition to low levels of intra-community conflict. With an average payoff of IDR 42,842 (USD 4.76) per m<sup>3</sup>, these cases incurred no enforcement costs and little rent-seeking costs. In the lower-right quadrant, there are three cases of firm compliance with high intensities of intra-community conflict. The two cases with zero household participation received an average fee of IDR 50,722 (USD 5.64) per m<sup>3</sup>, while the third case may have involved opportunistic blockading given a low but positive rate of household participation. This community received IDR 17,500 (USD 1.94) per m<sup>3</sup>.

Of the 40 communities reporting firm non-compliance, there are 26 cases of non-compliance (as reported by community leaders) where communities undertook blockading against firms, i.e. with household participation. Six of these cases are in the upper-left quadrant of figure 1, with relatively high household participation rates (50 percent or more) in community-firm conflicts but relatively low levels of intra-community conflict (50 percent or less). Two cases are located in the lower-left quadrant with low rates of household participation, in addition to low levels of intra-community conflict. These eight cases received an average fee of IDR 43,322 (USD 4.81) per m<sup>3</sup>, including the value of in-kind benefits. This high average payoff suggests that despite low household participation in two cases, self-enforcement was effective in securing benefits from firms. These eight communities are most likely to represent cases of 'true' self-enforcement.

The remaining 18 cases (as reported by community leaders) are located in the right side of figure 1. With the exception of one case, they have low (50 percent or less, but greater than zero) proportions of participating households and high intensities of intra-community conflict. In the same quadrant, there are another two cases that were not even claimed by community leaders as being community self-enforcement actions and hence, were more likely to be opportunistic actions by households. These 20 communities received an average fee of

IDR 24,405 (USD 2.71) per m<sup>3</sup>. The lower rates of household participation for these 18 cases along with higher levels of intra-community conflict indicate that rent-seeking of one form or another may have taken place in these communities. The relatively low fee suggests that these communities were not effective in self-enforcing their agreements.

As figure 1 illustrates there are a number of cases where firm non-compliance occurred but with apparently no actions taken against firms (as reported by community leaders). In the lower-left quadrant, there are three (overlapping) cases with zero household participation (average payoff, IDR 29,289 (USD 3.25) per m<sup>3</sup>), which was either due to there being no conflict between the parties or perhaps a low community ability to organise. In the lower-right quadrant there are eight cases of firm non-compliance with zero household participation due to there being no conflict between the parties. With a relatively low average fee of IDR 28,031 (USD 3.11) per m<sup>3</sup>, and relatively high intensities of intra-community conflict, rent-seeking may have been prevalent within these communities.

This analysis cannot distinguish among the motivations for actions on the right-hand side of figure 1. The incorporation of other variables into the analysis might help to identify the motivations for community-firm conflicts. Opportunistic blockading, for example, might be identified by having relatively lower household participation rates. In order to test the presence of multi-variable clusters in the sample, factor analysis is used. The idea is to identify underlying variables, or factors that explain the pattern of correlations within a set of observed variables. In addition to the intensity of intra-community conflict and household participation in community-firm conflicts, two other closely related variables are included in the analysis: the duration of the longest conflict with the firm and the frequency of community-firm conflicts that took place in each community.

The correlation matrix indicates significance at the 0.05 level for almost all combinations of factors<sup>21</sup>. The exceptions are intensity of intra-community conflict with both duration of the longest community-firm conflict and household participation in community-

firm conflicts. Overall, the factor analysis is unable to shed much light on understanding the motivations underlying community behaviour in many of the non-compliance cases on the right-hand side of figure 1. Nevertheless, duration and participation seem to be strongly, positively correlated. This suggests that longer enforcement activities against firms generally have higher household participation, thus supporting the idea that longer enforcement actions require higher participation and hence, greater collective action to be sustained.

#### *IV.2.6 Environmental costs*

##### *IV.2.6.1 Changes in perceptions of environmental impacts from decentralization*

Households were asked about their perceptions of changes (positive, negative, no change) for five selected environmental indicators in two specified periods, before and after decentralization: river water quality (for washing and drinking); flooding and water levels; hunting; collection of forest products; and, agriculture. Then, for responses of 'positive' or 'negative', they were asked why they thought there had been a change.

An average of almost 80 percent of respondents per community indicated a negative change in water quality from logging, both before and after decentralization. An increased incidence in flooding was indicated by over 75 percent of respondents before decentralization, and 70 percent afterwards. Over 60 percent indicated that hunting had been adversely affected both before and after. Statistical differences between local environmental impacts as perceived by communities are tested. Thus, for all indicators, each pair is the proportion of households in each community that perceived the specified environmental impacts before and after decentralization. The results show that there are no statistically significant differences between changes resulting from HPH and IPPK/HPHH logging on water quality, flooding and hunting. Thus, perceptions of these impacts remain unchanged with decentralization.

An average of 75 percent of respondents per community indicated negative logging impacts on forest product collection before decentralization, falling to 52 percent afterwards;

the mean difference of 23 percent is statistically significant. Perceived negative impacts of logging on farming also significantly declined with decentralization, from 30 to 17 percent. Since HPH firms typically prevented communities from entering concession areas and utilizing the forest, households may have been more likely to state that they had negative impacts on farming and forest product collection due a lack of accessibility to the forest, rather than changes in the actual indicators. An average of 8.8 and 9.4 percent of households per community responded that IPPK/HPHH activities positively impacted on farming and forest product collection, respectively. Logging opens up forest, which makes cultivation of the land easier and enables easier access to forest products. Note, however, that unimpeded access was almost certainly an unintended as well as an unsustainable side-effect of logging.

With the exception of farming and forest products, environmental impacts did not appear to have become better or worse from the household perspective. However, the relative severity of impacts cannot be inferred from these data nor can it be compared across communities. 36 communities indicated that their IPPK/HPHH concessions were either partially or fully located in old HPH areas. Of these, 28 concessions had been logged previously, which introduces the element of impacts from 'logging on logging'. Thus, in comparison to what has been shown, more households could be expected to respond in the negative when questioned about these environmental impacts. There are a number of possible explanations for these results. First, communities have been known to deliberately underestimate logging damages from IPPK/HPHH operations because they think that by providing support for the system, it could continue without government interference (see Limberg, 2004). Moreover, many communities were clustered in similar areas, and it was very difficult for some respondents to be able to differentiate among the impacts from a proliferation of concessions. Other reasons include the fact that some communities were located far from their concessions, while others resided upstream from logging activities.

Finally, communities may have been able to negotiate some environmental controls in their agreements in order to limit local logging impacts.

#### IV.2.6.2 Trade-offs between the environment and other contractual provisions

Did communities make or were they forced to make any trade-offs between financial and environmental provisions when negotiating IPPK/HPHH agreements? 35 out of 55 (64 percent) agreements in the sample contained some kind of environmental provision. The commonest provisions included reforestation and a limit on the diameter of trees to be cut<sup>22</sup>.

Table 3 compares the contracts with and without environmental provisions. To test whether there are any statistically significant differences between the two types of contracts, the independent samples t-test is used. For first promised fee, a high value for the t-test ( $p = 0.218$ ), implies that there is no significant difference between the two group means. The results are similar for renegotiated fees, promises of in-kind developments, employment and agricultural developments as well. In other words, there are no significant differences in contract provisions between the contracts containing any environmental provisions and those containing none at all. Therefore, there is no statistical evidence of any negotiation trade-offs between the environment and other contractual provisions.

For actual fee payments, the t-test indicates that a significant difference between the two group means (see table 3). With respect to the proportions of communities experiencing compliance with in-kind developments, job provision and agricultural developments, the t-tests indicate no significant differences between the two groups. Hence, as before, there is no statistical evidence of trade-offs in actual contract outcomes as a result of environmental provisions in community-firm agreements except that actual payments are slightly higher for contracts containing environmental provisions.

In summary, while there is no evidence of a trade-off between promised fees and environmental provisions, there is some evidence that the contracts containing environmental

provisions were more likely to have higher actual financial pay-offs compared with those that did not. Thus, communities that negotiated contracts containing environmental provisions may have had a greater capacity to self-enforce agreements than those with none. This result supports the findings of Engel and López (2004), and Engel, López, and Palmer (2006) that the ability of communities to establish *de facto* property rights over the forest is a prerequisite to obtaining any kind of benefits at all.

There is little evidence of significant differences between perceptions of environmental impacts resulting from contracts containing environmental provisions and those that did not. Table 3 indicates that the differences between the group means for water quality, flooding and forest products for contracts containing environmental provisions and those containing no provisions are not statistically significant. The differences for negative impacts on hunting and farming are statistically significant, although actual impacts on farming appear to be worse for those agreements containing environmental provisions in contrast to all other environmental indicators. Possibly, the inclusion of environmental provisions in the contract also reduced community access. Overall, since most environmental indicators are not significantly different, communities that negotiated environmental provisions in their contracts were definitely not worse-off than those that did not negotiate these.

## **V. Synthesis and discussion**

This paper sought to analyse the impacts of decentralization on communities in Indonesia, which are summarized in table 4. With regard to benefits, in contrast to one percent of households before decentralization, almost all households received some financial benefits afterwards. A significantly higher proportion of households also received some in-kind benefits. However, at the community level, there was wide variation in the levels of fees received. Negotiations for IPPK/HPHH concessions clearly empowered many households,



which we quantified in terms of ‘perceived forest ownership’. The proportion of households indicating community forest ownership alone significantly increased from 21 percent before decentralization to 82 percent afterwards. Significantly fewer households indicated that firms or the government ‘owned’ the forest in 2003-04 compared to the pre-decentralization era.

One notable feature of community empowerment after decentralization has been the trend towards community enforcement of property rights over forest and forest borders vis-à-vis other communities and firms. The benefits from community-firm logging agreements provided a clear incentive for communities to assert their forest claims. Conflicts between communities over land claims and borders occurred in around half of the sample post-decentralization. Though many of these conflicts originated well before decentralization, the freer political environment and sudden rush to capitalize on forest claims through IPPK/HPHH deals caused these to erupt into the open. Contrary to expectations, the proportion of communities that participated in community-firm conflicts remained unchanged, from 42 before to 43 percent after decentralization as indicated in table 4. Thus, enforcement costs incurred by communities before decentralization were higher than expected. Post-decentralization, a third of households on average per community participated in activities against firms, double the proportion pre-decentralization. Community empowerment and an acknowledgement of community forest rights may have made people less fearful in standing up for their perceived rights. However, high community monitoring and enforcement costs meant that the first and sometimes the only priority of many communities was to ensure that the firms complied with financial promises.

The sudden influx of cash into materially poor communities after decentralization led to a surge in rent-seeking activities, usually by members of well-placed community elites. While rent-seeking could not be observed directly, we attempted to qualify these costs, through questions on rent distribution within communities. High levels of intra-community conflict as a result of problems about the distribution of rents indicates that rent-seeking was a

serious problem in at least half of all surveyed communities (see table 4). In communities where these problems were most acute, bitterness, anger and jealousy were apparent from household interviews. It is possible that in some of the smaller, more remote communities, this rent-seeking behaviour may have long-term consequences for social capital such as a breakdown of trust and community collective action.

We attempted to distinguish between ‘true’ enforcement actions and those that may have been driven by rent-seeking (‘opportunistic blockading’ and ‘useless blockading’). ‘True’ actions are more likely to have occurred in communities with higher household participation. Moreover, the result from the factor analysis suggests that actions of a longer duration are strongly correlated with higher household participation. Conflicts took place in three communities that were not identified as self-enforcement actions in the community surveys and hence, were almost certainly ‘opportunistic’ actions. It might be expected that the relative ease of shutting down firm activities would have given different groups within the community the incentive to ‘go it alone’. In the data, this would have been observed as higher household participation, similar to observing a high proportion of community members undertaking a single collective action. Nevertheless, multiple groups competing to extract rents from a firm would almost certainly lead to a higher intensity of intra-community conflict, unlike a collective action undertaken by the whole community. The nearly empty quadrant in the top-right of Figure 1 shows that this incentive did not appear to exist in the communities surveyed.

‘Opportunistic’ or ‘useless’ blockading might have provided a disincentive for firms to comply further. Consequently, this precludes the use of firm compliance data for distinguishing among the possible community motivations underlying actions taken against firms where rent-seeking appeared to be prevalent. Therefore, with the exception of those eight communities recording low intensities of intra-community conflict, we cannot conclude whether or not the remaining communities recording household participation in blockading

activities actually undertook ‘true’ self-enforcement activities against firms. It seems likely, however, that had they taken place, rent-seeking in whatever form undermined the incentive for many households in these communities to participate in the enforcement activity. This is supported by the data for fee monies received. The eight communities that we identified as undertaking ‘true’ self-enforcement actions (in the upper-left quadrant of figure 1) received an average of IDR 43,322 (USD 4.81) per m<sup>3</sup>, while all the non-compliance cases in the bottom-right quadrant of figure 1 only received, on average, IDR 24,405 (USD 2.71) per m<sup>3</sup>.

Comparing environmental impacts before and after decentralization, there were, as expected, no significant differences between perceptions of negative changes from logging on water quality, flooding or hunting (see table 4). There were, however, significantly fewer perceived negative impacts on forest product collection and farming from IPPK/HPHH operations compared with HPH operations. Overall, local ecological damages remained pervasive from IPPK/HPHH concessions, although it is unclear from a survey of this type whether the impacts from these have intensified or not since decentralization. The measure of damages according to peoples’ perceptions is obviously limited in that it does not say anything about absolute environmental impacts. Moreover, while the survey attempted to distinguish among impacts from two different periods in time by asking about changes in each period, there are clear problems in separating out the effects from HPH and IPPK/HPHH based on peoples’ perceptions. In areas where several communities are located and where concessions overlap, informal discussions with community members suggest that while negative changes were perceived both before and after decentralization, forest damage from logging may in fact have gotten worse over time.

The ability of many communities to have some say in where concessions were to be located, in addition to insistence on logging rules may have tempered some local impacts. There is, however, little statistical evidence of a trade-off between environmental and financial provisions. It seems that communities could negotiate relatively high fees at the

same time as environmental provisions. Thus, some communities not only benefited financially from logging but also limited local logging damages at the same time.

## **VI. Conclusions**

The impacts of decentralization have hitherto been mainly researched through the case study approach. While describing financial gains and environmental costs from post-decentralization concessions in Indonesia, studies such as Casson and Obidzinski (2002) and Resosudarmo (2004), for example, did not attempt to quantitatively assess these impacts on communities. More generally, research undertaken on the impacts of decentralization in natural resource management has neither, until now, readily attempted to quantify these.

In this paper, a conceptual framework was formulated and the expected directions of effect with decentralization were derived for five defined categories of impact. The results from a sample of 60 communities show that communities did indeed benefit financially from decentralization, albeit with large variation across the sample. In addition, we analysed the costs of enforcement (*vis-à-vis* firms and other communities) and attempted to assess the many and varied impacts of rent-seeking within communities. Neither of these impacts had been quantitatively researched before, at least not in the Indonesian context. The results show that many communities incurred real costs, which should be set off against the financial and in-kind benefits. While there were environmental impacts from post-decentralization concessions, these may not be significantly worse than under the centralized regime. Furthermore, we show that decentralization led to households becoming significantly empowered as a result of their IPPK/HPHH experiences. While the MoF still has formal ownership over and land title to all of Indonesia's forests, this finding suggests that people already feel that they own the forest regardless. Overall, a minority of sampled communities benefited very well from IPPK/HPHH deals, particularly those in the lower-left quadrant of figure 1 that received high financial payoffs and experienced firm compliance with

agreements and hence, incurred zero enforcement costs with respect to firms. The majority of sampled communities, however, reported numerous problems. In particular, a third of the sample located in the lower-right quadrant in figure 1, experienced firm non-compliance, low community participation to ensure compliance and high rates of intra-community conflict. In these communities, it is likely that decentralization has brought relatively low financial payoffs at high social cost.

This paper also analysed the possible trade-offs between the environmental and financial contractual provisions that were negotiated by communities. Again, this is the first time such an analysis has been attempted and the results suggest that there is in fact little evidence for communities trading off one set of provisions against the other. Instead, communities that negotiated environmental provisions in their agreements on average also received higher payments than those that did not. Hence, communities that negotiated contracts containing environmental provisions had a greater capacity to self-enforce agreements than those with no such contractual provisions. It should be noted, however, that IPPK/HPHH logging almost certainly created negative environmental externalities that were not internalized by communities negotiating these agreements, such as those associated with carbon storage and biodiversity.

Given how *de facto* decentralization occurred during the economic crisis and the growing empowerment of Indonesia's rural and indigenous communities, it is possible that these changes would have happened even if Suharto had stayed in power. Moreover, even if the 'official' decentralization of Indonesia's forest sector not occurred, it is likely that large-scale logging would have remained uneconomic in many parts of Indonesia due to the effects of the economic crisis in the late 1990s. This suggests that small-scale concessions may have occurred anyway in order to meet timber demand. Had Suharto stayed in power, he may have, at some stage, been forced to distribute logging and other natural resource rents to the Outer Islands in order to preserve his position. With millions of people suddenly dropping below the

poverty line, the sheer impact of the economic crisis in 1997-98 was such that the Suharto regime may have had no alternative but to allow them to share in these rents. While it is almost impossible to separate out the effects of the decentralization reforms and those of the economic crisis, it is unlikely that the latter varied widely across the communities sampled in East Kalimantan, hence making little difference to the results presented in this paper. The legitimization of the forest claims of some of the most vulnerable and poorest groups in Indonesian society came about through state decentralization reforms and this is having long-term ramifications both for state-society relations and Indonesia's forests.

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## Tables and Figures

**Table 1: Impacts of mechanised logging on communities: a framework for analysis**

Type of impact on community (Related hypothesis)		Empirical indicators in survey results	Expected direction of effect		
			Pre-decentralization	Post-decentralization	
Benefits	Financial (I)	Total value in IDR per community, IDR per household, proportion of households receiving fee	0	+	
	In-kind (I)	Type and total value in IDR per community, proportion of households aware of benefits, proportion of households with company employment, wage rate (IDR per day), length of logging operation (days)	0/+	+	
	Social ('empowerment') (II)	Proportion of households indicating perception of forest ownership	0	0/+	
Costs	Social ('cohesion and trust')		0	0/-	
	Enforcement (III)	Conflict with firm (IIIa)	Proportion of households participating in activity against firm, type of activity, length of conflict (days)	0	0/-
		Conflict with other village (IIIb)	Proportion of households indicating conflict from forest border/claims	0	0/-
	Rent-seeking (cost of unproductive activity) (IV)		Proportion of households indicating problems over distribution of financial and in-kind benefits	0	0/-
	Ecological costs (local impacts) (V)		Proportion of households indicating negative effects on water quality, flooding, hunting, forest products, farming from specified concession	0/-	0/-
<b>Overall</b> (most positive outcome/most negative)			+/-	+++/-	

**Note:** IDR denotes Indonesian Rupiah; '+' denotes positive outcome, '-' negative outcome. (That is, a '-' on costs, implies an increase in costs and thus a negative effect on overall outcomes.)

**Table 2: True' self-enforcement', 'opportunistic' or 'useless' blockading?**

Type of blockading	Empirical measure		
	Initial firm compliance	Level of household participation in community-firm conflict	Level of intensity of intra-community conflict
True self-enforcement	No	High	Low
Opportunistic	Yes	Low	High
Useless	Yes	High	High



**Table 3: A comparison of contracts with and without environmental provisions**

	Contracts containing environmental provision	Contracts containing no environmental provision	Difference
Number of contracts	35	20	
Average first fee promised (IDR per cubic meter) <sup>1</sup>	47,897	38,762	9,135
Average fee including renegotiated fee (IDR per cubic meter) <sup>1</sup>	44,615	42,357	2,258
Percentage of contracts containing social developments	79.0	71.4	7.6
Percentage of contracts containing jobs for community members	87.2	76.2	11.0
Percentage of contracts containing agricultural development <sup>2</sup>	34.2	42.9	-8.7
Average actual payment (IDR per cubic meter)	38,698	22,300	16,398**
Average actual payment as % of first fee (as % of final, renegotiated fee): fee compliance level.	80.8 (86.7)	57.5 (52.6)	23.3 (34.1)
Percentage of social development promises complied with <sup>2</sup>	76.7	86.7	-10.0
Percentage of employment terms complied with <sup>3</sup>	85.3	87.5	-2.2
Percentage of agricultural promises complied with <sup>3</sup>	15.4	11.1	4.3
Percentage of environmental promises complied with <sup>3,4</sup>	53.8	-	-
Average percentage of households indicating negative impact on water quality <sup>5</sup>	76.4	82.2	-5.8
Average percentage of households indicating negative impact on flooding <sup>5</sup>	67.2	77.7	-10.5
Average percentage of households indicating negative impact on hunting <sup>5</sup>	60.1	72.3	-12.2*
Average percentage of households indicating negative impact on forest products <sup>5</sup>	48.1	58.7	-10.6
Average percentage of households indicating negative impact on farming <sup>5</sup>	20.9	10.7	10.2*

**Note:** For all fees used conversion rate IDR 9,000 = USD 1.00. 1 - First and renegotiated fees considered if applicable. 2 - Unfortunately a lack of data for agricultural developments meant that it was not possible to include a valuation of these benefits, and here they have been treated as a discrete variable. 3 - Includes contracts only partially complied with. 4 - 'Environmental compliance' is measured only from community level responses about company non-compliance in general. None of the responses were verified by checking concession areas. Any replanting fees are accounted for. 5 - Per contract. For shared agreements, these include all sampled households for communities sharing. \*difference between contracts containing environmental provisions and those not containing provisions is significant at 0.10 level; \*\* difference is significant at 0.05 level.

**Table 4: Summary of results for impacts from decentralization**

Type of impact		Expected direction of change from decentralization (Impact on community well-being)	Results: before and after decentralization
I. Financial and non-monetary benefits		Increase (+)	Household perceptions of financial benefits received increased significantly from a mean of 1% of households per community, to 94%, while perceptions of in-kind benefits received also increased significantly, from a mean of 11% of households per community to 18%.
II. Social indicators	a. Empowerment	Increase (+)	The mean proportion of households indicating community forest ownership alone significantly increased from 21% to 82%.
III. Enforcement costs	a. Conflict with firm	Increase (-)	The numbers of communities claimed to have undertaken activities against firms remained unchanged from 25 (42%) to 26 (43%). The proportion of households participating in enforcement actions increased from 18% to 34%. Eight of the 26 post-decentralization cases are identified as ‘true enforcement’ with little intra-community conflict, and high household participation rates in six cases. The remaining 18 may be opportunistic or useless blockading due to rent-seeking, or ‘true enforcement’ undermined by rent-seeking. Another three possible ‘opportunistic’ cases were reported.
	b. Conflict with other community	Increase (-)	33 communities (55%) reported problems with other communities after decentralization. Household majorities in 28 cases (47%) indicated similar problems. Households reported no problems whatsoever in only nine communities (15%).
IV. Rent-seeking costs		Increase (-)	21 communities (35%) reported distributional problems. Household majorities in 32 cases (53%) reported similar problems. Blockading against companies with low household participation rates (below 50% of households) was present in at least 18 of these cases. Households reported no problems whatsoever in 13 cases (22%).
V. Environmental costs		No difference	There were no significant differences between perceptions of negative impacts before and after decentralization for water quality, flooding or hunting. Improved access to forests post-decentralization resulted in significantly less negative perceptions for impacts on forest products and farming.

**Note:** ‘+’ denotes a positive effect on overall benefits from decentralization; ‘-’ denotes a negative effect on benefits (or an increase in costs).

## Endnotes

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<sup>1</sup> For efficiency and equity arguments see, for example, Baland and Platteau (1996). However, efficiency and equity gains from decentralization may be dependent on the degree and form of power transfers to local institutions (see Ribot, 2003).

<sup>2</sup> *Hak Pengusahaan Hutan*, a large-scale timber extraction concession licence.

<sup>3</sup> McCarthy (2000) asserts that small-scale, non-mechanized logging by local communities occurred on a wide scale after 1971 despite attempts to outlaw it. Institutionalised relationships at the local level limited the power of the state to implement laws, especially in remote districts. Some community members also involved in covert agreements with HPH firms, resulting in an informal, local timber economy based on non-mechanised logging (Casson and Obidzinski, 2002).

<sup>4</sup> *Izin Pemungutan dan Pemanfaatan Kayu* (license to extract and use timber), and *Hak Pemungutan Hasil Hutan* (license to collect forest products). Both types of permit were used as a means of operationalizing small-scale timber concessions (Palmer, 2004).

<sup>5</sup> Casson and Obidzinski (2002: 2142) also describe how the community incentive to participate in the IPPK/HPHH permit system over the ‘illegal’ system derives from the opportunity to ‘legitimately’ benefit from logging. The very fact of being able to obtain a legal recognition of their forest claims also factored in the widespread popularity of the IPPK/HPHH permit system.

<sup>6</sup> HPH concessionaires were supposed to follow the Indonesian Selective Cutting and Planting System (*Sistem Tebang Pilih Tanam Indonesia*, or TPTI), over rotation times spanning decades. Selective logging usually resulted in some timber stocks remaining in HPH concession areas.

<sup>7</sup> Known as *Pembinaan Masyarakat Desa Hutan* or PMDH (‘development of villages in forest areas’).

<sup>8</sup> Logging activities may have had positive economic impacts on other, local industries, e.g. sawmills, at least in the short-term (Casson and Obidzinski, 2002).

<sup>9</sup> Note that while households were asked for their perceptions regarding ‘forest ownership’, communities only received use rights over forest resources as a result of decentralization. However, survey respondents tended to make little or no distinction between ownership and use rights.

<sup>10</sup> There may be social costs associated with inter-community conflicts over forest claims that might affect community relations and future cooperation. While it is acknowledged that such costs might arise both in the short and the long-term, an explicit quantification of these was unfortunately outside the scope of this study.

<sup>11</sup> Rent-seeking by national elites may decline with decentralization, so the net effect is unclear.

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<sup>12</sup> Hoddinott (2002) argues there is an even higher risk of rent capture of benefits by local elites to the detriment of the poor in fractionalised communities where trust and/or social capital is weak.

<sup>13</sup> Intra-community rent-seeking affects equity among community members, a concept that is very strong among communities, irrespective of religion (Palmer, 2006). Thus, internal divisions and conflicts, unless quickly and amicably resolved could lead to longer-lasting impacts on social capital, i.e. a reduction in cohesiveness, trust and the ability for collective action (see for example Hoddinott, 2002). Again, these costs were outside the scope of this study.

<sup>14</sup> While there were almost certainly rent-seeking costs before decentralization, particularly at the national level (see for example Brown, 1999), this analysis focuses on costs incurred at the local level only.

<sup>15</sup> Local non-use values and other externalities are not considered due to being outside the scope of this study.

<sup>16</sup> Communities were selected as randomly as possible on the basis of previous research and government data, e.g. permit lists. In each of the three districts surveyed, at 22 communities were sampled, spread over as many sub-districts as possible and according to time and budget constraints. However, the difficult circumstances in the field meant that there was an element of selectivity bias in the sample (for more information see, Palmer, 2005). A total of 65 community-level and 687 household interviews were conducted in Malinau, Bulungan and Kutai Barat between September 2003 and January 2004, using a research team consisting of seven people.

<sup>17</sup> While community employment with IPPK/HPHH operations was not extensive due to contractors preferring to bring in employees from outside, the surveys were unable to capture logging employees by firm. In some communities, people worked locally for HPH firms or even in different areas altogether and the survey results could not always distinguish among these.

<sup>18</sup> The exchange rate used here and in the remainder of this paper is IDR 9,000 = USD 1.00

<sup>19</sup> The determinants of this variation in received payoffs is examined in Engel and Palmer (in press).

<sup>20</sup> These differences in community and household responses are due to a combination of differing levels of household awareness of such problems and the leaders' perceptions of the severity of these problems.

<sup>21</sup> All data were suitable for use in the factor analysis. Detailed results can be seen in Palmer (2006).

<sup>22</sup> Provisions for non-timber plantations such as rattan gardens and palm oil plantations are classified here as 'agricultural developments'. These are to be distinguished from 'reforestation', an activity that was supposed to be undertaken by firms and hence, is defined here as an 'environmental rule'.