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JHM-16

INDUSTRIAL FOREST

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Samarinda, East Kalimantan
Indonesia

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Dear Peter and Friends,

From the clay road newly bulldozed along an easy-rise ridge, the highest in the area, the view is clear from horizon to horizon. A field of starkly black and white tree stumps and debris meets uninterrupted sky. Wisps of smoke rise from embers still smoldering, while shifting breezes fan small fires elsewhere. The low tangle of ravaged and charred vegetation is silent.

This is an eerie scene here in Borneo, where the eye expects patches of sky only over rivers or through gaps in lush green growth, and the ear gauges the time of day and the weather by changes in the mix of buzzes, chirps, and calls from such an assortment of creatures that counting them is a daunting challenge and silence seems like a bizarre invention. This is not a set for a movie warning of a nuclear holocaust, nor is it the result of a catastrophic, accidental forest fire.

Pak Tonny Harnoto points out the young trees with a few leaves poking through the ashes not far from where we stand. This is the beginning of the Sumalindo Lestari Jaya company's industrial tree plantation at Muara Lawa, East Kalimantan. The site, which is planned to cover 33,000 hectares, eventually, is a 2½ day passenger/cargo boat ride, or 8 hours by 110 horsepower speedboat up the Mahakam and Kedang Kepala Rivers from Samarinda. For logs, it's a 12 day float back down to Samarinda's plywood factories and sawmills. Pak Tonny, an enthusiastically healthy Javanese forester, has spent most of the past 10 years logging in Kalimantan. Now he's happy to do something that he feels is more constructive, managing this tree plantation which may soon be typical of commercial projects being developed by timber companies in Kalimantan as part of "integrated" forest industries.

Forestry in Kalimantan generally means logging. But in a few pockets such as this, it has also begun to include planting trees. Facing future shortages of commercial timber supplies, the Indonesian Forestry Department has begun encouraging companies to embark on tree planting schemes, or "industrial forest estates" (Hutan Tanaman Industri, in Indonesian, called HTI for short). They are to be paid for mainly with money collected since 1980 from logging companies as "replanting guarantee funds" (Dana Jaminan Reboisasi, or DJR), a tax on timber removed from Indonesian logging concessions, at US \$4 per cubic meter.

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The terms of Indonesia's selective logging system concession agreements require that companies logging natural forests also plant trees. Until recently, these regulations were largely ignored. But now, many companies' original 20-year forest concessions are about to expire. Indonesia's new Forestry Minister, Hasjrul Harahap, has acknowledged that over the last 20 years since Indonesia began granting forest concessions, most concession-holders have blatantly violated many of the conservation-oriented stipulations of their logging agreements. He has announced that concessions will only be renewed to companies that fulfill the major terms of their concession agreements, including the replanting requirements. Companies without planting projects or plans will, in principle, not only lose their concessions, but also forfeit the money they deposited for the DJR. (Whether this resolve can resist heavy political pressure to overlook delinquencies remains to be seen.)

Companies wishing to make or protect long-term investments in their current concession areas are beginning to get the message, and climbing on the tree-planting bandwagon. Others, interested only in recovering their DJR deposits, are making plans as well.

The attractiveness to private firms of long-term investments in tree planting is limited, however, by the short duration of forest concession periods in Indonesia. There is much speculation that the 20-year terms will soon be extended for "good actor" companies in order to encourage long-term forestry investments and sustainable forest management in the private sector by ensuring that companies investing in replanting and in conservative logging practices will be able to reap the rewards of their investments in the distant future.

There are currently 36 HTI projects in Indonesia approved for drawing on DJR funds. East Kalimantan has 11 of them, and the province's regional forestry office projects that 15 more will be started, covering a total of up to 1,200,000 hectares by the year 2000. National and East Kalimantan policies on approval for HTI locations and plans has recently been refined to try to make sure that HTI will be used for forest rehabilitation rather than for permission to destroy productive and healthy forest -- with windfall profits for timber companies, which often seek to cash in on any opportunity to clearcut. Bapak Soenarsan Sastrosemito, a high-ranking Forest Department inspector from Jakarta who was visiting Sumalindo's HTI when I was there, mentioned that the Forestry Department has withdrawn approval for using DJR funds at 17 sites where land clearing had already begun over the past few years. Recent surveys of these areas showed that these areas were often excellent-quality forest in no way needing "rehabilitation," the major official justification for clear-cutting and replanting.

In East Kalimantan, most of the land that fits the definition of being degraded enough to need rehabilitation by total clearing and large-scale replanting was burned in the 1982-1983 fires. Some is land that has been overcultivated by swidden farmers so that it has become alang-alang grassland, virtually useless for forestry or agriculture. Other lands the government classifies as degraded may actually be capable of generating healthy secondary forest, but have only recently been left by shifting cultivators. Only recently has the Forestry Department used an objective standard for "degraded" or "nonproductive" forest land -- land with logging potential of less than 20 cubic meters of timber per hectare.

Under Indonesia's selective logging system, the first-choice means of logging and replanting involves cutting about 50 cubic meters of saleable logs per hectare of primary forest, then nurturing the residual stand (trees left over after logging) so that it can be cut a second time 35 years after the first cut. Young trees, generally the same kinds of indigenous hardwood species ^{as those} cut, are supposed to be interplanted in or near areas where the old trees were cut. Growth of commercially valuable trees may also be encouraged through selectively removing "less desirable" species around them, a thinning-out strategy, to give the commercially valuable trees a competitive edge, with more light and growing space.

However, restoring natural forests after logging is not the priority or purpose of the HTI, which are generally planted with fast-growing species that do not occur naturally in Borneo. The front seat in government and private investment strategies looking for a quick return is providing abundant, cheap raw materials for new wood-demanding industries.

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About a quarter of the land in Sumalindo's planned plantation was selectively logged in 1981 and 1982; in 1983, forest fires burned almost 90 percent of the area the company intends to reclear and plant with fast-growing trees. Although many of the trees survived the fires 5 years ago and a healthy growth of secondary forest is being razed to provide land for the plantation, the Forestry Department considers such commercial plantation development to be "forest land rehabilitation." Government foresters point out that the burned-out forest and secondary growth following the early 1980s fires contain few Dipterocarpus and other hardwood rainforest trees that could eventually become "mother trees," providing enough seeds to support the natural regeneration of the rainforest.

Original project plans call for 79 percent of the Sumalindo plantation to be devoted to 2 Eucalyptus species (degleupta and urophylla) with about 5 percent Acacia mangium, all tropical silviculture mainstays, none of them native to Borneo. Shorea species (Borneo natives including the meranti that dominate rainforest canopies) are supposed to account for 16 percent of the plantation. But at this point, a year after clearing began on the project's first 1600 hectares, Acacia still make up the bulk of the plantings. There have been problems with the Eucalyptus, which suffer from dry weather and have been attacked by fungus.

Bapak Agus Sugiono, Sumalindo's nursery foreman, gave me a tour of 1,300,000 seedlings arrayed in the nursery's new rectangular beds and watered through hoses from a gravity-feed system drawing on the adjacent stream. The seedlings are mainly Acacia and Eucalyptus propagated from seeds bought from Inhutani, Indonesia's government forestry corporation that operates on the islands outside of Java. There are no Shorea or native seedlings yet. If the next few months turn out to be a good fruit season, nursery staff will begin experiments growing native hardwood species from seeds that will be collected from Sumalindo's logging concession of 95,000 hectares, which includes the HTI site.

Albizia trees will be planted for shade on cleared and burned land, 5 meters apart. When these trees are 2 years old, Dipterocarpus trees will be planted between them, 10 meters apart. Later, when the Dipterocarps are old enough to survive in full sunlight, the fast-growing

Albizia trees will be cut down and hauled away, leaving what Sumalindo hopes will be viable pure hardwood stands. But this is not a tried-and-true technique; Dipterocarps generally do best in existing forests, where their growth can be assisted by complex relationships with micro-organisms characteristic of rainforest soils. Experiments are now showing that some of these relationships can be duplicated by artificially inoculating soils around young trees, but it is not yet common practice in Borneo. Although the Sumalindo project will depend mainly on clear-cutting and planting single-species stands, some seedlings will also be planted in pockets of the HTI that will not be cleared; these will be experiments in enrichment planting of natural secondary forest.

According to Sumalindo's plans, Eucalyptus and meranti trees planted at its Muara Wahau HTI could be harvested after only 30 years using cheap clearcut techniques, since they would be growing in pure or similar-use-species stands. The Acacia mangium trees could be cut after only 15 years. At 30 years, the meranti trees would be almost 50 centimeters in diameter and over 22 meters high, yielding about 3 cubic meters of usable wood per tree. But these would still be spindly little sisters to the 90-meter-high, 2-meter-diameter trees Kalimantan's loggers have recently cut from the natural forests. There is, as yet, little evidence to show that large-scale meranti plantings will even grow to a 30-year maturity, since large-scale cultivation is still so new and experimental that it is difficult to predict growth and yield at 30 years under plantation conditions.

Sumalindo's project plans and feasibility studies cover a 60-year period, with the most rapid planting at the beginning of the project. But nowhere in the plans are there any accounts of the project's sensitivity to unknown factors, which is unfortunate considering that much of the technology being used is very experimental in the Kalimantan context. Other HTI have had problems with Eucalyptus die-out, perhaps due to unsuitable soil and water conditions in HTI areas. And Acacia mangium trees, unless they are tended and pruned, tend to turn into large, shiny-leaved bushes rather than tall trees with strong main trunks. (If this happens at Sumalindo's project, the Acacia wood could be suitable only for pulp and woodchip industries, which do not yet exist in the Mahakam River basin, rather than for the plywood and blockboard-making anticipated in the project plans.)

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Over the past year, since land clearing for the Sumalindo plantation began, the HTI has become a key aspect of the economy around Muara Wahau, an area that has also been targeted for rapid settlement and development over the next few years. Land clearing, the nursery, and planting all require a great deal of labor -- according to Sumalindo's plans, over 450 people at a time over the first few years. But there have not been this many people available to work at the isolated plantation site.

The work at the HTI is very labor-intensive. Land clearing and planting have been divided into parts, most of which are contracted out to local work-crew organizers, with the lump sum paid to the crew boss when the contracted work is completed. Land clearing uses heavy equipment only to build roads, which are located so that vehicles can reach within 500 meters of any part of the plantation. Although bulldozing might be a cheaper way to clear the land, Sumalindo is using gentler methods

to avoid soil compaction, which would make it difficult for young trees to grow. Land clearing and planting are done by crews of men and teenage boys. First, a clearing crew of between 10 and 20 people cuts small growth, anything less than 30 centimeters in diameter, with parang (long hacking knives) and occasional axes. These crews are usually enlisted by contractors at the new Transmigration sites that have been settled since 1986 around Muara Wahau. For many of these workers, the HTI wages (about Rp. 50,000 per month, or US \$30) are their families' only cash income. Others come for a few weeks at a time, alternating with periods working on the new hybrid coconut plantation that will eventually provide Transmigrants with a steadier source of cash.

After all the small growth has been cut, a chainsaw crew fells any remaining trees. These men are usually Dayak residents of the village of Miao Baru, a bustling settlement on the edge of the timber concession. Miao Baru's population is mainly ethnic Kenyah and Kayan people from the Apo Kayan plateau near the Sarawak border, who have migrated down to Muara Wahau, a much more accessible area, since 1972. The chainsaws are normally supplied by the contractors, who have worked out various arrangements for dividing payment. Most of the contractors also have small shops selling groceries and other provisions, and make a tidy sum supplying their work crews with daily needs on credit, at highly inflated prices.

Usable timber is removed from the land clearing sites, sawed into boards and posts for plantation buildings with a portable sawmill operated by a contractor. Sumalindo has gotten several trees per hectare for building, but it amounts to only 1 to 3 cubic meters per hectare cleared so far. Because of the company's decision to use only timber from on-site for plantation buildings, construction has been slow, and most workers are still camping out in crude tent-shelters thrown together from a few boards for a floor and sheets of plastic suspended above. Eventually, field workers are supposed to be provided with more substantial shelters.

After all of the cut vegetation has dried for about a month, a crew of burners, usually from the Transmigration sites, torches the debris a few hectares at a time. Originally, areas of up to 200 hectares at a time were burned, but as the year has progressed, wet weather and schedule delays have prevented such extensive burns. Contractors are paid a flat rate of Rp. 105,000 per hectare for land clearing (about US \$62) or about Rp. 10,500,000 for a contract block of 100 hectares. In theory, it would take a crew of 40 men and 6 chainsaws about a month to clear 100 hectares; in fact it has taken 2 to 3 months for each block because crews have been smaller than expected and many men drop out before completing a contract block.

Tree planting is supposed to start immediately after the first rain following burning off debris, after the land has had time to cool, with both Eucalyptus and Acacia trees planted 3 meters apart. But over the past year there have been problems with seedling supplies and with finding enough planters to keep pace with land clearing. So almost half of the land that was originally cleared has had to be re-cleared before planting to eliminate new growth, particularly of vines that would strangle seedlings. In other cases, bad scheduling has meant that planters move in on land still smoking, even before the first



Planting a tree
in the debris

rain, with the result that many of the trees planted die almost immediately and the area must be replanted. *Planting Costs about Rp. 25,000 per hectare.*

Young women from both Miao Baru and the Transmigration sites staff the tree nursery. Recent migrants from Java and the eastern Indonesia island of Flores work beside Dayak teenagers from Miao Baru. They live in a slapped-together camp beside the nursery, although a tin-roofed lodging is being built for them. The nursery staff fill plastic bags with a soil and fertilizer mixture, plant sprouts in them, water the young plants, and select seedlings at about 3 months ready for planting in the prepared fields. These women are employed directly by Sumalindo rather than through contractors, in large part to guarantee that the seedlings will get the constant attention they need. The wage for this work is Rp. 2750 per day (about US \$1.60), the highest wage for women anywhere in the area, and one of the few I've heard of anywhere in Indonesia where women routinely earn more than male laborers on the same project.

Despite the need for cash that drives people around Musara ~~Wahzu~~ to work at Sumalindo's HTI, most people I spoke with, both those working at the site and those who aren't, believe people seeking this work must be fairly desperate for money to subject themselves to the rigors of life on the new plantation. Field workers at the HTI expect to get malaria.

No one knows if the area had malaria parasites before land clearing began for the HTI; no one stayed in the area long enough, before, to find out. However, Sumalindo's logging and road building activities for the plantation have drastically changed drainage patterns on the land, blocking normally flowing water and increasing the amount of stagnant water, conducive to mosquito breeding. Contract field workers also tend to locate their camps near this water, since there is no other water supply for bathing and drinking. Though some people sleep with mosquito nets, the primitive camp conditions make all of the field workers extremely vulnerable to contracting malaria, and this is the main reason for quitting work at the HTI. The project employs a paramedic and has a small dispensary. Malaria accounts for the greatest number of medical

complaints. The paramedic normally gives malaria victims a big dose of chloroquine, sends them to rest, and suggests that they come back if attacks don't stop. But those who go to "rest" at the camps often begin work again while they are still extremely weak; others return to the Transmigration project or Miao Baru, where they usually get no further treatment.

All workers at the HTI, whether employed by contractors or directly by Sumalindo, are registered for government-sponsored workers' insurance through ASTEK, the state insurance company. This provides some compensation in case of serious injury and to families in case of death at work. It also ensures medical treatment for work-related illnesses. Workers at the HTI know that chronic malaria will affect them for life, if they get it.

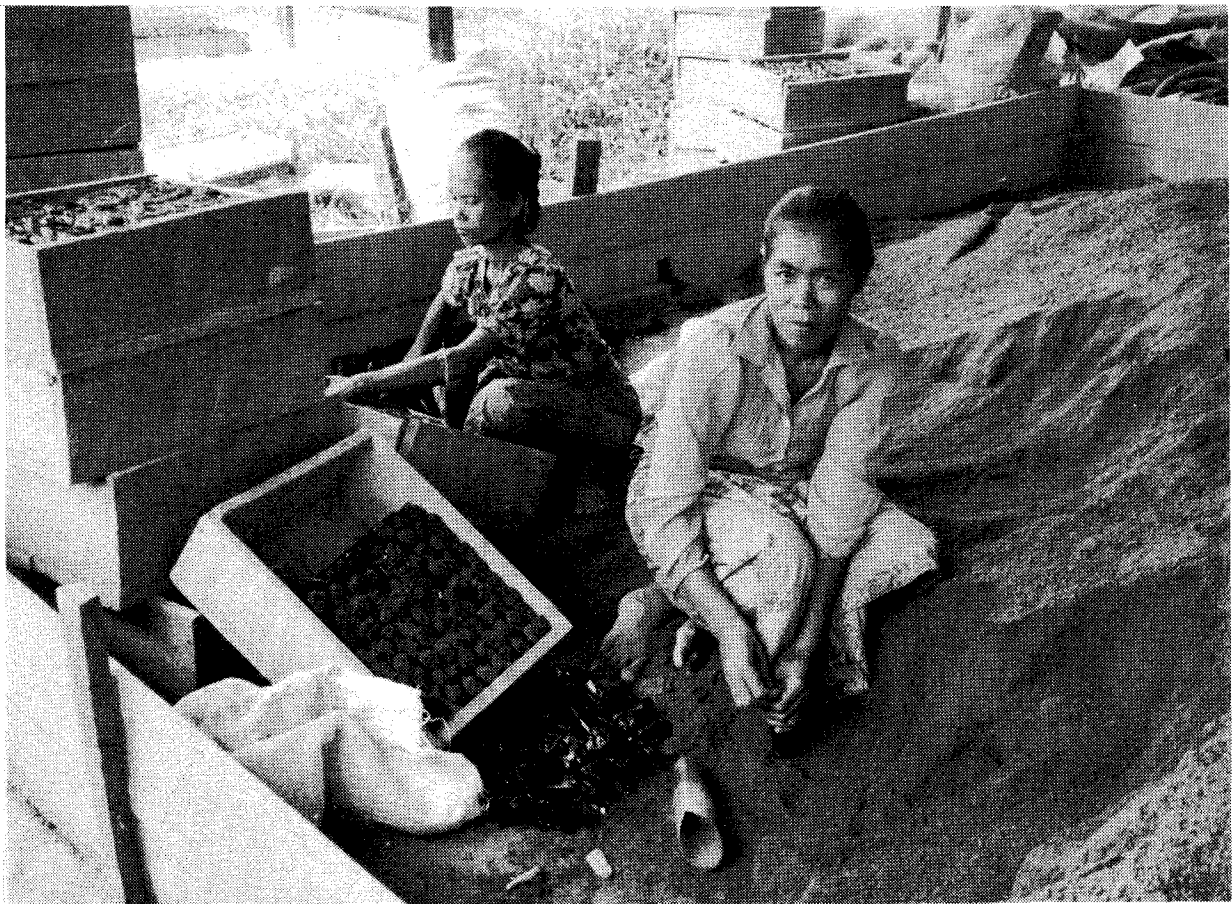
Transmigration project development staff have ambivalent feelings about the relationship between Sumalindo's HTI and the Transmigration project. They blame the HTI for the neglect of much of the cropland cleared for new settlers to grow their own food, while young men go to work for cash at the HTI. The cleared but uncultivated land is often overgrown by alang-alang grass, the scourge of cleared former rainforest land throughout the tropics.



Planting Acacia mangium trees on cleared land that is already being overgrown with creepers. This area will need extensive weeding if the trees are to survive. About 1100 trees are planted per hectare.

Wages from work at the HTI may save several hundred recent Transmigrant families from ruin, however, and keep them from having to return home to wherever they came from, in desperation. For the first year after Transmigrants arrive at the Muara Wahau projects, they are expected to plant staple food and garden crops on the hectare of cropland and the quarter-hectare houseyard cleared and protected until cultivation with a leguminous cover crop. Transmigrants are given a basic food supply for their first year, and by the time that runs out, new settlers are supposed to have harvested a rice crop and be providing for their other food needs from the garden. Cash needs are supposed to be met through work on the PTP VI coconut plantation until the mature trees produce saleable coconuts.

But the budget for several hundred hectares of new coconut plantation development has failed to materialize, eliminating wage work opportunities on the plantation for over 300 families depending on it after free food allocations run out during their second year at the project. To make matters worse, the local governments where many of these new settlers came from often failed to provide emigrants with promised seeds to plant gardens in their new home. (This contribution from the local governments in Transmigrants' places of origin is normally part of the "package" provided for program participants to start a new life as pioneers in Kalimantan.) Thus, many families who arrive in Muara Wahau with few resources of their own are delayed in planting gardens



Javanese Transmigrant women fill plastic bags with soil mixture at the nursery.

until they can get seeds elsewhere, often difficult with little money in a completely unfamiliar, isolated area without much of an agricultural market. Cash is absolutely essential for these people to survive, and many of them have sought work at the HTI almost immediately after arriving at Muara Wahau.

Not all of the Transmigrants working at the HTI are there because they have no other choice, however. The flight of men to the HTI has caused problems, especially for the women left behind at home. In many households where men have gone to work at the HTI, food growing has fallen completely on the shoulders of women remaining at the Transmigration site, many of them already overburdened caring for young children in an unfamiliar environment without the usual support of an extended family. Walking around one of the older Transmigration villages, the houses of men who have gone to work at the HTI are distinctive by the sparseness of their gardens and general lack of care. Ibu Sitifatimah, whose husband now works at the HTI, says that the Rp. 50,000 that he earns at the HTI each month barely covers rice and minimal other expenses. She has had 3 children since arriving at Muara Wahau from Java in 1986, and appears exhausted as she explains that when her husband comes home once a month with his pay, he generally sleeps feverishly the whole time, while Sitifatimah struggles to take care of him until he is well enough to leave again. Her husband, like many of those who have gone to work at the HTI, has neglected the obligation to work 2 weeks per month



Kenyah Dayak woman from Miao Baru waters Acacia mangium ready for transplanting.

on the coconut plantation developed by state enterprise PTP VI as part of the Transmigration "package." (See JHM-15 relative to another PTP VI project in East Kalimantan.) If Transmigrant families work on the coconut plantation, workers are paid Rp. 2000 per day until the trees begin to yield; once the trees begin to produce saleable crops, each family will, in principle, earn ownership of 2 hectares of coconut trees 15 years after they start paying off debts to PTP VI. Ibu Sitifatimah fears that by neglecting both food crops and cash crops in favor of working at the HTI, her husband's choice may jeopardize the family's long-term prospects at the Transmigration site.

At this point, viable development of the HTI and of the Transmigration project are intimately intertwined, due to the HTI's need for workers and the Transmigrants' need for paid work. However, only in the past couple of months has there been willing recognition by project managers on either side of the need for coordination between them. By demanding long contract work periods, the HTI and its contractor/bosses made it necessary for Transmigrants working at the HTI to choose between improving their situations by working at the Transmigration site and earning a cash income. By simply hiring most field workers through intermediaries (the contractor/bosses) Sumalindo itself came under little pressure to protect workers' health and enable them to maintain a reasonable standard of living at the HTI site, or a complementary standard of living at home, at the Transmigration site. Likewise, until recently Transmigration authorities were unwilling to acknowledge that new settlers brought in by their projects were unable to survive on the opportunities provided by their program. Over the past 2 years in particular, since the Muara Wahau projects began, the Transmigration program has been hard-pressed, particularly by international funders such as the World Bank, to make the newest Transmigration projects, with their emphasis on cash crops, appear viable. Admitting that new settlers were unable to make a living under the conditions provided by the project, in part due to broken promises about what the project would provide, would be an admission of bureaucratic failure.

A few months ago, Indonesia's President Soeharto proclaimed that Transmigration and the forestry sector were to be mutually supportive. Suddenly, it was alright, even encouraged by national policy, for Transmigrants to provide a necessary work force for reforestation. Old proposals for forestry- and agro-forestry-based Transmigration projects are being unearthed and discussed as ways of rescuing Transmigration projects in trouble. But with this new interest have come questions of whether Transmigrants working on forestry projects should be given a permanent, long-term interest in the trees they plant, rather than being treated as only casual labor by the timber companies that employ and depend on them.

Transmigration planners and consultants are trying to work out ways to coordinate with HTI managers so that Transmigrants could get steady but part-time work with Sumalindo, and devote the rest of their time to developing the Transmigration site. They want Sumalindo to agree to give priority to employing people who have not received work on the coconut plantation as promised, rather than Transmigrants seeking work at the HTI because its wages are better than those at the coconut plantation, and they can work for wages full-time rather than just a few days a month. The Transmigration people also want Sumalindo to provide malaria prophylaxis and proper shelter for all workers. Ideally, Transmigration

managers would like Sumalindo to agree not to employ any Transmigrants from the government project full-time, and keep the contractors from doing so as well. They hope this will avoid the neglect of food crops that is now common among households where members are gone, working at the HTI. However, this provision was still under negotiation when I was at Muara Wahau.

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Sumalindo's plans to develop its industrial timber plantation bring up a number of issues relating to more general questions of environmental and land use management in sparsely populated areas of Borneo that were, until recently, primary forest. What should be done with the land that was badly burned in the fires of the early 1980s, 3.7 million hectares of it? How much of it should be rehabilitated as forest, and what kind of forest? If it is true that natural regeneration alone would take centuries to produce a high-quality rain-forest in many areas because of the lack of Dipterocarp family seeds, due to the destruction of old trees by fire, what are the alternative forms of rehabilitation that make sense for each area?

Now that the old forest is gone, there is pressure from many sides to use the land more intensively, in the interests of spreading settlement, increasing foreign exchange earnings, making individual and corporate fortunes, and strengthening political control by central authorities in remote regions. Desires of local people in these areas to develop the land on their own behalf are often overwhelmed by large-scale plans backed with big budgets from outside. A patchwork of land use alternatives is emerging, reflecting actual land use by local populations (with or without blessing of government authorities), and competition for land between companies, between timber, mining, or "land development" companies and local populations, between politicians, and between bureaucracies. In hashing out long-term land use plans for the burned region, the Forestry Department has scored points for itself by maintaining that the most rational future use for most of the land will remain in the forestry sector. But many foresters wonder if large-scale monoculture of exotic, low-value wood species is too much of a gamble for the future productivity of large areas of land. They are aware that if huge industrial wood plantations fail to grow as planned, they could end up with large expanses of Imperata cylindrica (alang-alang) grassland and scrub much more difficult to rehabilitate than the secondary forests they are clearing for the plantations. A few investment-minded foresters in Kalimantan are also beginning to realize the economic risks of foregoing opportunities to rehabilitate natural mixed hardwood forests that will be much more valuable for timber and other diverse products than the monoculture of "junk species" usually chosen for large-scale planting.

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A few notes on some business aspects of the HTI may help to give some idea of the financial commitment involved in setting up and paying for an industrial timber plantation, and provides some indication why the largest companies expressed interest in developing HTI first.

If DJR money is accumulated at US \$4 per cubic meter of timber cut, and companies can count on getting about 50 cubic meters of timber per hectare from the first cut on primary hardwood forest, this means that they are paying about US \$200 per hectare logged into the replanting guarantee fund. The fund will pay out Rp. 600,000 (now worth

about US \$350) for each hectare planted as part of a HTI. Even with high initial investment costs for developing plantations, most of the companies using the DJR for plantation forestry expect to make money in the end, with the sale of wood from the plantation, or wood products, in the future. Sumalindo is no exception; the company is not known for losing money.

Sumalindo is part of Indonesia's many-tentacled Astra business group, controlled mainly by the Soeryadjaja family, which has close connections with leading political figures in Jakarta. Sumalindo controls 8 logging concessions in East Kalimantan, covering almost a million hectares, one of the largest logging interests in the province. Logs from these concessions are processed at Sumalindo's plywood factory and sawmill just outside of Samarinda. The Astra group has recently submitted a proposal to develop a pulp mill and woodchip factory, which would be the Mahakam River's first, and a HTI for pulpwood nearby, just upriver from Samarinda. Sumalindo also plans to begin logging a huge concession in Irian Jaya (Indonesia's easternmost province, in western New Guinea) and may send some of the logs from there for processing at its Kalimantan plants. Sumalindo is using DJR money collected on logs from 3 of its East Kalimantan concession areas to develop the tree plantation at Muara Wahau, releasing the the company from some replanting requirements at the other 2 concessions.

Sincerely,

Judith Mayer



Inspecting some of the first Acacia mangium trees planted at Sumalindo's industrial forest project. These trees are less than a year old.