CIFOR in Asia

Celebrating 20 years of research

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Cover photo: Ricky Martin/CIFOR
A local fisherman catching freshwater fish in Situ Gunung Lake, West Java, Indonesia.

CIFOR
Jl. CIFOR, Situ Gede
Bogor Barat 16115
Indonesia

T +62 (251) 8622-622
F +62 (251) 8622-100
E cifor@cgiar.org

cifor.org

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Introduction

Asia's forests host a wealth of treasures and resources that are critical to the livelihoods of people living in and around them, to the economic development of the countries endowed with them, and to the world's ecosystem and climate.

With such high local and global value, the effective, sustainable management of these forests is a challenge with high stakes. And yet human activities continue to drive deforestation and degradation of forests, which in turn threaten the livelihoods of thousands and contribute further to a warming global climate.

Since its inception 20 years ago, the Center for International Forestry Research (CIFOR) has sought to understand how to maintain healthy forests and inform forest management strategies that optimize outcomes for livelihoods, economic development, biodiversity, environmental effects and sustainability. From the Javan leopard to timber used for furniture, plantation policies to community participation, charcoal to carbon storage. CIFOR's work has viewed forests in the context of some of Asia's biggest current challenges: poverty, illegal logging, a growing timber demand, wildlife conservation, and climate change.

This volume showcases a snapshot of CIFOR's 20-year journey with Asia, its forests, and its forest dwellers. It is a celebration of the positive impact that science, knowledge, and collaboration has had, a reminder of the challenges that remain, and a symbol of CIFOR's continued commitment to rigorous, collaborative and innovative research. We welcome the next 20 years of CIFOR in Asia. ■

Landscape of a natural production forest in the concession area of PT. Sumalindo Lestari Jaya 2, in Long Bagun, West Kutai district, East Kalimantan, Indonesia.

Photo by Michael Padmanaba/CIFOR

1 – Understanding forest ecosystems

Tributary of the Kahayan river at Pandawei Forest inventory team in a canoe, Central Kalimantan, Indonesia.
Photo by Christian Cossalter/CIFOR

Kayan Mentarang Research Forest

Annual Report 1995

In Bulungan district, East Kalimantan, lies one of the largest remaining expanses of tropical forest outside of the Amazon. A quick glimpse of this forest reveals clear rushing rivers, sacred hornbills and mountain peaks crowned by cloud forests. The forest is a source of livelihood to local Kenyah and Lun Daye farmers, Punan hunters and gatherers, and indirectly to the Chinese traders and other coastal groups that

periodically ply the rivers and search the forests for the valuable incense wood (*Aquilaria* spp.), birds' nests or bezoar stones. The forest is also a source of revenue to the timber concessions that build roads and log the lower-elevation sites. Isolated and yet not, the villagers living in this forest may own a satellite dish for their TV, but also require five days by boat travel to reach the nearest hospital.

Although distinct in its expanse, the forest in Bulungan shares many of the same challenges facing forests and forest-dependent people anywhere in the world: resource availability, simultaneous pressures for conservation and economic development, and increasing competition for forest use among different interests. CIFOR is addressing these global challenges though its research programmes world-wide but, until recently, has not had the opportunity to begin long-term investigation of the dynamics and complexity of such issues in any one place.

The Government of Indonesia made such long-term research possible by creating the 300,000-hectare Kayan Mentarang Research Forest in Bulungan and granting CIFOR permission and support to conduct long-term research there. The creation of the research forest – the first ever in Indonesia – and the agreement with CIFOR grew out of a provision in the host-country agreement granting access to a long-term research site. CIFOR began the search for an appropriate site in 1994 and, in October 1995, submitted a recommendation to the Indonesian Department of Forestry for an area in Bulungan located between the Kayan and Mentarang rivers. The Minister of Forestry approved the designation in December 1995.

Importantly, the creation of the Kayan Mentarang Research Forest does not change existing land-use zone designations or rights to land and forest products. The agreement gives CIFOR permission to conduct research in the area in partnership with local government, forest users and other researchers. One example of a partnership CIFOR hopes to develop is to join WWF and PHPA in facilitating the creation of a 'model forest', which would be an umbrella arrangement covering both the Kayan

▲ Kenyah woman weaving rattan basket, East Kalimantan, Indonesia.
Photo by Lini Wollenberg/CIFOR

Mentarang Research Forest and Nature Reserve. Together the two areas constitute an expanse of more than 1.7 million hectares. Under the model forest arrangement, a steering group representing diverse government, community, research, educational and private commercial interests would help guide the development of management practices and programmes for improving local peoples' well-being. The steering committee would also guide research and provide an outlet for implementing research findings. ■

Community members from Langap discuss plants with other members of the field team, East Kalimantan.

Photo by Douglas Sheil/CIFOR

Understanding the forest

2001 Annual Report

In 1996, the Indonesian government demarcated a 320,000 ha area of forest in Bulungan District for CIFOR to use as a long-term research area. The International Tropical Timber Organization (ITTO) funded a 3-year project on forest management and sustainability in a large forest landscape that attracted a number of other partners.

Over the years a unique partnership evolved in the district of Malinau in East Kalimantan. Researchers and local groups collaborated to identify and address the needs of the stakeholders by finding the best ways to manage a large forest.

‘The lessons we have learned provided us with baseline information that will support longer-term research,’ said CIFOR’s Kuswata Kartawinata, who led the project. ‘These results are laying the basis for finding negotiated solutions that will last into the future.’

On biodiversity, CIFOR’s research in Bulungan helped define the priorities of the local people and assist in a wide range of processes, from developing reduced-impact logging guidelines to setting forest conservation policy.

‘We have developed a suite of methods to assess biodiversity and landscape information and what matters to local communities,’ said Doug Sheil, CIFOR’s biodiversity specialist.

By using a new technique called multi-disciplinary landscape assessment, project researchers could work out which animals and plants the different groups of local people used or valued and how important these species were to them. These efforts gave special attention to previously marginalized groups such as the Punan, who have traditionally been hunters and gatherers and depend very heavily on the forests. The assessments are now serving the basis for discussions about land use planning. They are also contributing to new forestry practices and regulations that can help to protect those plant and animal species that communities value the most.

For example, regulations that require concession holders to repeatedly slash all undergrowth and climbers after felling are intended to reduce aggressive weeds to encourage regeneration. In practice, it cuts many useful species, including rattan and timber seedlings. This slashing may be more damaging to the forest than the harvesting itself and we are suggesting that this policy be reviewed, said Doug.

On reduced impact logging, techniques developed allowed companies working in Bulungan to harvest 7-9 trees per hectare and still keep damage to the soil and water resources to a minimum. Controlling how trees fall and how they are taken out of the forest reduced damage to the remaining trees by up to half. This means that the logging companies probably do not need to pay for costly regeneration treatments. Lower operational costs actually outweighed the expense of training and supervision. And the forest workers found that with the right planning they

could meet the same daily volume in a shorter time than using conventional techniques.

‘Since several companies such as PT Inhutani II and PT Trakindo Utama were involved in the process from the start they feel completely confident about the reliability of the results,’ said Machfudh, a scientist from Indonesia’s Forestry Research and Development Agency (FORDA) seconded to CIFOR, who was closely involved in the research.

Complementing the biodiversity work was sociological research among the Punan people on their attitudes to forest products. This approach has provided key insights into the way forest dwellers regard forest resources and challenged some long-held assumptions.

‘Most of the people do not collect forest products on their own initiative,’ said Patrice Levang, a French scientist seconded to CIFOR from the Institut de Recherche pour le Développement. ‘Economic dependency on forest products is seldom the result of free choice; it is often the only option available to forest people to generate cash income.’

There are also variations in the degree of dependence on forest products among ethnic groups and individual households. Forest products abound in isolated areas and provide much of the livelihood needs of the Punan hunter-gatherers, while downstream areas have other options available to the local Dayak swidden cultivators like agricultural and off-farm activities. This greater understanding will allow development initiatives to match more closely the attitudes of the forest dwelling communities, and hence greatly increase the likelihood of benefiting them. ■

Fires are used to clear peatland in Indonesia.
Photo by Ryan Woo/CIFOR

Seeing REDD in Indonesia

2007 Annual Report

Every year some 11 million hectares of forest — an area almost the size of Greece — are destroyed. This destruction is having a dramatic impact not just on wildlife and the livelihoods of forest-dwelling people, but on the world's climate. Deforestation and land clearance are responsible for roughly a fifth of the world's greenhouse gas emissions, making them a major cause of global warming.

In some areas, deforestation and land clearance matter more than in others. 'Indonesia is losing almost 2 million hectares of forest a year, but from the point of view of climate change the scale of the problem is worse than these figures imply,' explains CIFOR climatologist Daniel Murdiyarso. The disproportionate impact stems from large expanses of Indonesian peatlands being converted to grow oil palm and other crops. In the process, huge quantities of carbon are being released.

Each year, carbon dioxide emissions from peatlands in Southeast Asia amount to around 2,000 million tons. This amount is equivalent to around half of the total emissions caused by land-use change activities — deforestation in tropical countries being the most significant — and 8 percent of global emissions from the burning of fossil fuels. Ninety percent of Southeast Asian peatland emissions come from Indonesia, making the country the third largest emitter of greenhouse gases after the United States and China.

The scale and significance of peatland conversion to agriculture was highlighted by a series of studies conducted by the Indonesian Forest Climate Alliance and commissioned by the World Bank in 2007. The studies, which involved 12 CIFOR scientists working with researchers from a number of other organizations, investigated how Indonesia might benefit from projects designed to bring about Reduced Emissions from Deforestation and forest Degradation (REDD). The scientists assessed the various approaches required to curb carbon emissions from a range of land uses, including timber production, oil-palm plantations, industrial timber plantations and conservation, on both mineral and peat soils. The findings were discussed at a series of workshops and presented in Bali at the 13th Conference of the Parties to the United Nations Framework Convention on Climate Change.

The magnitude of Indonesia's peatland carbon emissions is a considerable embarrassment to the Government of Indonesia, but Murdiyarso believes that it also represents a considerable business opportunity. 'In REDD negotiations,' explains Murdiyarso, 'Indonesia should be able to use its past emissions as a reference point for future reductions. If it could control peat forest fires, then Indonesia would have much 'hot air' to sell; for

example, to countries buying carbon credits to offset their own industrial emissions.'

Murdiyarso points out that a similar situation prevailed in Russia when the Kyoto Protocol first came into force. Russia's quota for reducing emissions was 17 percent of the global target, second only to the United States. During the following years, Russia experienced an economic crisis. Its emissions fell dramatically — by default rather than design — and it found itself with plenty of 'hot-air' to sell under the Kyoto Protocol's Joint Implementation and Emissions Trading schemes. If Indonesia could curb peatland fires, it could potentially earn billions of dollars from REDD projects.

Murdiyarso and his colleagues developed an 'architecture' for future REDD projects in Indonesia. They looked at how to establish baselines; how payments might be distributed among different stakeholders; how risks might be shared between buyers and sellers. The study was only a preliminary analysis, but it helped to inform future demonstration activities funded by the World Bank's Forest Carbon Partnership Facility and designed to explore how to make REDD projects work.

CIFOR also worked closely with Ministry of Forestry and Forestry Research and Development Agency (FORDA) staff to develop the REDD-Indonesia website. This one-stop learning portal in Indonesian is designed to raise awareness about REDD within the government, as well as within NGOs, the media, forest communities and other stakeholders. Since the upgrade and relaunch of the site in April 2011, visits have continued to increase, with more than 5000 visitors downloading thousands of publications on REDD every month. ■

Area near Gunung Lumut where clear-cutting has occurred, most likely for oil palm production.
Photo by Moses Ceaser/CIFOR

Plantations and Rehabilitation of Degraded Land

1998 Annual Report

Plantation forestry, especially on degraded or low-potential sites, is a major focus of research by CIFOR because of the need to meet the world's huge appetite for lumber, pulp and other wood products. Much of this work includes efforts to optimise the productivity of plantation forests.

The challenge for foresters, scientists and industry is to develop planted forests that are economically

viable as well as biologically sustainable. This is already being achieved in many industrialised countries. Yet plantation forestry is still relatively new in many tropical countries, and little is known about local conditions and problems that may limit yields – poor water and nutrient levels in the soil, erosion, genetic stock variation and improper site preparation, for example.

In 1998, field experiments continued at 16 plots in seven countries – Australia, Brazil, China, Congo, India, Indonesia and South Africa – in a project to determine the best methods for plantation harvesting in tropical countries under a wide range of ecological conditions. The results will help site managers select the best management strategies to correct productivity problems at the individual sites, and should be relevant as well to plantation forestry in general.

Among the sites under study are low-performing eucalyptus plantations in China and India. Planted eucalyptus forests are one of the major sources of wood and pulp for both domestic and international demand. But yields at the experimental sites in China and India are well below average for the species. Researchers are testing a variety of treatments they hope will remedy the problem. One focus of research is silvicultural techniques for improving degraded forest lands. A joint study with Kasetsart University in Thailand, for example, is evaluating the ecological impacts of teak plantation thinning at various patterns and intensities, and the effects on intercropping with plants such as coffee. In another plantation study, experiments got underway in 1998 at two 7-year-old eucalyptus plantations in Sao Paulo State, Brazil, that are owned by paper mills. Planned in conjunction with Brazil's EMBRAPA/CNPQ, the study will evaluate how the impacts of soil compaction from harvesting and tilling methods affects site productivity. The findings will have broad implications, because eucalyptus forests make up nearly 40 percent of all tree plantations in Brazil, with about 1 million acres in Sao Paulo State alone.

In a major partnership with China, CIFOR scientists are studying socioeconomic approaches that could help support widespread efforts to

▲ Eucalyptus Plantation in nursery area of ex. Finnida Project, South Kalimantan, Indonesia.
Photo by Tini Gumartini/CIFOR

reclaim degraded lands. Degraded lands in mountainous and hilly areas account for more than 60 percent of China's total land area, and there is a dire need to encourage productive use of this land, especially by small-scale farmers. Tree planting is a highly favored solution, but there is concern about the sustainability of tree planting on such lands. The Chinese Academy of Forestry has produced a number of technological solutions, but a major problem is how to apply these technologies at a wide scale and in ways that are appropriate for selected areas. ■

Rangkong bird in the protected forest in East Kalimantan.
Photo by Yani Saloh/CIFOR

Biodiversity Conservation

1998 Annual report

Today, much of the widespread concern about the loss of tropical forests stems from increased public awareness about their importance as a major repository of biodiversity. Yet reliable scientific knowledge about the nature and extent of biodiversity loss from forest disturbance is still quite limited.

CIFOR research in this area includes studies to determine the impacts of disturbances such as logging, non-timber forest product extraction and forest fragmentation on in situ conservation of biodiversity. A goal is to acquire generalisable data from representative ecoregional research sites that can be used to generate and test spatial and process models.

In a wide-ranging project, researchers from India, Thailand, Indonesia and Malaysia have been working under the auspices of CIFOR and the International Plant Genetic Resources Institute (IPGRI) to investigate how human activities affect the genetic resources of forests. The work is multidisciplinary, involving research components on genetic resources, reproduction ecology of the species studied and socioeconomic aspects of communities in and around the forest sites.

In Malaysia, for example, it was found that although the impacts of logging were evident in all species sampled, the loss of genetic diversity did not exceed 24 percent. Similarly, the impact of harvesting wood for timber and fuel in Thailand was significant only at very high harvesting intensities.

A study in Central Kalimantan demonstrated a significant increase in species inbreeding after logging – results that will be investigated further in a dipterocarp species.

In 1998, with the recruitment of Danish International Development Agency associate expert Dr. John Poulsen, CIFOR launched a new initiative under this project in India's Western Ghats. The study, which entails extensive interviewing of local tribal and nontribal people, will assess landscape-scale impacts of non-timber forest product extraction on the region's flora and fauna, including birds, butterflies, small mammals, trees and herbs.

Other work in India done as part of this project revealed that poorer households are most heavily dependent on the collection of NTFPs, and with many NTFPs entering the market there is a tendency toward unsustainable harvesting, even among indigenous communities that traditionally have relied on these products for their livelihoods. Consequently, the regeneration of some important plant species has been almost completely absent in some areas, thereby eroding the genetic diversity of these species.

In Central Kalimantan, CIFOR scientists are studying the impacts of logging on the diversity of birds and small mammals, as well as on vegetation structure. Initial results from the comparison of biodiversity in logged versus unlogged sites have indicated that selective logging has less significant impacts on species richness and diversity. Patterns of bird community structure, species composition and relative abundance were adversely affected by both logging activity and landscape factors (as gauged by topographic position and wetness).

▲ Community discussing local birds.
Photo by Douglas Sheil/CIFOR

Meanwhile, biodiversity baseline data from integrated surveys in Indonesia, Thailand, the Western Amazon basin and Cameroon are providing insights into the response of biodiversity and carbon sequestration along gradients of land-use intensity. New, generic indicators of these response patterns have been identified through the use of Plant Functional Types (PFTs), which reflect plant adaptation to changing physical environments. A multidisciplinary study conducted in lowland Sumatra, Indonesia, has established potentially useful linkages between vegetation structure, key groups of plant and animal species, PFTs and soil nutrient availability. ■

Landmark findings show mangroves key to fighting climate change

2011 Annual Report

After a flight to a seaside town in Indonesia, a group of scientists travels 20 hours by boat to an inland riverine site where they spend a week, waiting for each day's low tide to clamber across a web of roots and knee-deep mud to reach a remote mangrove forest.

So began the grunt work that led CIFOR to pivotal findings in 2011 — pointing to mangroves as ideal repositories for keeping carbon out of the atmosphere and sequestered in forests — that are having significant implications for local and global policies.

The scientists unfurl measuring tape and jot down the circumferences of trees. They unload some 12 kg of stainless steel rods, bore them into the ground, and pry them out to collect core samples: at 1 meter deep, dirt that is gritty with leaf bits, and at more than 11 meters deep, earth that is black and slick as grease.

Slathered in mosquito repellent to guard against dengue fever and malaria, the scientists work quickly as the tide rises. They swim back to the boats. Back in the laboratory, they analyze the carbon in thousands of soil samples from across Southeast Asia. They crunch their numbers and are astounded by the results: mangroves store three to four times more carbon than most tropical forests.

Mangroves occur along the coasts of some 118 countries, but up to half of them have been destroyed in the past half century.

Scientists conduct research in a mangrove forest in Indonesia.
Photo by Daniel Murdiyarso/CIFOR

▲ A man canoeing among the mangroves, Yoke Village, Papua.
Photo by Mokhammad Edliadi/CIFOR

A spike in greenhouse gases has warmed Earth by 0.7°C over the past century, brewing an ever more turbulent blend of storms, floods, landslides, forest fires, temperature extremes and droughts.

‘Mangroves are being destroyed at an alarming rate and this needs to stop,’ said Daniel Murdiyarso, CIFOR Senior Scientist. ‘There is a lack of awareness of the full implications of mangrove loss for humankind. There is an urgent need for governments to acknowledge their importance and develop better policies to ensure their protection.’

Since the mangrove findings were published in 2011, they have received worldwide attention from the media, general public and scientific community. The findings were fed into the Intergovernmental Panel on Climate Change processes as it revised its guidelines for greenhouse-gas inventories in wetlands.

To further enhance the impact of the findings, CIFOR developed the Tropical Wetlands Initiative for Climate Change Adaptation and Mitigation in collaboration with research institutions, donor communities and regional academic partners. This included networking and capacity building across the globe to assess carbon stocks and greenhouse gas emissions from tropical wetlands.

The topic also received attention at the national level. In Indonesia — home to the biggest area of mangroves in the world, with close to 3 million hectares scattered across the archipelago — CIFOR hosted a journalist workshop on wetlands. Some 17 national journalists attended the workshop and the field trip to a mangrove forest, and more than 30 stories were published in major newspapers across the country. ■

Deeper Insight Into Forest Fires

1999 Annual Report

The recent fires that have ravaged large parts of Indonesia have spurred widespread demands for action to tackle the problem. In 1999 CIFOR and a partner CGIAR institute also based in Bogor, the International Centre for Research in Agroforestry (ICRAF), launched a joint research project that is taking a dramatically different approach from most fire-fighting efforts.

The scientists are working to get at the heart of the problem: Who is setting the fires, and why? Pinpointing the underlying causes will better enable national and regional policy makers to draft regulations and land use reforms aimed at curbing major outbreaks of fire, which often spread out of control as they did in 1997-98 and earlier years.

Field work for this research, funded largely by the U.S. Forest Service and coordinated by CIFOR's Graham Applegate, began in 1999 at eight sites in Sumatra and Kalimantan – the two hardest-hit areas in the 1997-98 fires. The methodology combines social science research with remote sensing and GIS to provide a comprehensive analysis of the origins of the fires, people's motives for setting them, and the social and environmental impacts. Ten sites for the in-depth studies were selected to represent different forest types and land uses, socioeconomic settings and other possible contributing factors to major fires such as the prevailing land tenure systems.

Initial results indicate that the problem is indeed complex and varies significantly from province to province. 'The research shows that fire may be used as a helpful tool or as a weapon in different scenarios,' notes Rona Dennis, the remote sensing/GIS coordinator for the project.

At one of the sites in Sumatra, for example, the studies revealed deep-seated conflicts between local people and companies establishing industrial plantations and oil palm estates – tensions that have been exacerbated by inadequate policies for land use planning. The research documented incidents in which local people deliberately set fires to retaliate for the takeover of land previously used for agriculture. In West Kalimantan, one of the study sites lies within a national park, where local people have used fire for hundreds of years to burn away patches of swampy forest for fishing. But today, the research shows, a growing influx of people and the severe dry conditions associated with El Niño, among other things, have made fire outbreaks a major problem in the area.

The CIFOR-ICRAF work draws on the findings of complementary fire research projects by several other organisations. The scientists will eventually integrate the site-specific studies and the island-wide assessments to provide a solid foundation for government-oriented policy analysis and recommendations. ■

Good Prospects for Reduced-Impact Logging in Indonesia

1999 Annual Report

Preliminary results from recent experiments at Bulungan Research Forest are highly encouraging for officials in Indonesia who want to adopt more environmentally sensitive logging practices throughout the country's forests. According to a cost-benefit analysis by Hariyatno Dwiprabowo, reduced-impact logging techniques are less costly and less destructive in comparison with conventional harvesting. 'Although the trial suggested there is still room for improvement, it is a very promising approach for adoption by concessionaires in Indonesia,' he concluded.

Reduced-impact logging consists of timber extraction methods designed to reduce the major ecological damage often caused by conventional logging practices. Studies of reduced-impact logging elsewhere have demonstrated its viability and cost-effectiveness. Results can vary, however, according to local conditions. Therefore, the Indonesian government requested the experiments to test the feasibility of the approach for forests in Indonesia. Major support for the research was provided by the International Tropical Timber Organisation.

In the past, logging in the nation's forests has caused excessive damage to residual stands of trees and left large amounts of residue. Such damage can wreck the ecology and resilience of forests. It reduces wildlife habitats, contributes to erosion and increases the risk of damage from forest fires. Yet timber concessionaires in Indonesia have been concerned that the use of reduced-impact

techniques would increase logging costs because of the need for better planning and supervision of harvests.

CIFOR's chief partner in the field trials was Inhutani II, a government timber concession; forest ecologist Plinio Sist supervised implementation of the reduced-logging techniques. The experiments, done in 100-hectare blocks, were designed to compare conventional logging with reduced-impact harvesting in regard to productivity, amount of residue left in the forest and logging costs, among other things. The cost assessment was based on operational or technical costs, mainly related to preharvest planning and the felling and skidding operations.

The preliminary study showed that, compared with conventional harvesting, the reduced-impact approach improved productivity. Although planning costs were higher because of the need for more accurate inventory and more intensive training, the additional costs were offset by the lower cost of felling and skidding operations resulting from increased productivity in a better planned operation. The reduced-impact harvesting methods also produced a significantly lower volume of log waste (logs not recovered) as a result of proper road layout and correct felling. This translates into more potential revenue for the company. Finally, site damage was reduced in the form of significantly fewer land openings caused by skid trails and log landings. The damage to remaining trees was also found to be less. ■

Pile of logs at a logpond on the side of Mamberamo River, Papua.
Photo by Mokhammad Edliadi/CIFOR

Logging for wildlife

2007 Annual Report

Ask conservationists what they think about logging in tropical forests, and many will paint a grim picture. They will tell you how industrial logging has destroyed vast areas of forest, dramatically reduced biodiversity, and frequently been associated with corruption, violence and the abuse of local communities. In many areas, this is precisely what has happened, and it explains why conservationists are often opposed to logging in tropical forests.

But logging needn't be like this. 'We've found that well-managed logging can be compatible with wildlife conservation,' explains Erik Meijaard, a forest ecologist with The Nature Conservancy and co-author of *Life after logging: Reconciling wildlife conservation and production forestry in Indonesian Borneo*, published in 2005.

▲ The douc langur is one of the many species threatened by logging.
Photo by CIFOR

Life after logging looks at the way in which individual mammal and bird species react to logging. Based on detailed field research carried out by CIFOR scientists in the Malinau watershed in East Kalimantan, and a review of the literature, the book provides the guidance logging companies need if they are to manage their concessions in a way which benefits wildlife without reducing their profits.

'Our study shows that the loss of dipterocarp trees — which are what logging companies take — actually affects few vertebrate species directly,' explains Meijaard. 'It is often the activities associated with logging which cause most of the problems.'

For example, logging roads make forests more accessible to local people and hunters from outside. It seems that hunting, rather than logging, has led to the decline of targeted species like the clouded leopard and Malayan sun bear. The slashing of ground vegetation after logging, insisted upon by law to encourage regeneration, affects the food resources of terrestrial insectivores. And logging activities often cause soil erosion, which leads to

the muddying of rivers and the loss of amphibians and fish.

The species that suffer most from logging tend to be specialists. In evolutionary terms these are often the older species, which evolved at a time of uniform forest cover. For example, yellow muntjac, western tarsier and the Malay civet, all of which are specialist feeders, appear particularly sensitive to logging. In contrast, species such as red muntjac and Malaysian field rat, which evolved more recently in a more open environment, have fared better, as they have a varied diet and are not as fussy about habitat.

Such insights have enabled the researchers to come up with detailed recommendations. They suggest logging companies should design roads in ways that avoid dividing the forest into too many fragments. Sufficiently large areas need be set aside to protect large carnivores, and there should be regulations to control hunting in timber concessions. Certain areas should be left untouched as they are particularly important for wildlife. These include mineral-rich springs and clay soils, abandoned villages and riverside vegetation.

'We're not saying that logged forest will have as high a conservation value as undisturbed forest,' says CIFOR ecologist and co-author Doug Sheil, 'but logging is one way of maintaining large forest landscapes in a way that is economically productive and far more beneficial for wildlife than many other land uses.'

The study has provided logging companies with comprehensive guidelines on reconciling timber production with conservation. The recommendations have also helped to influence and guide a similar study involving the Swedish University of Agricultural Sciences, CIFOR and the Forest Science Institute of Vietnam. ■

A Javan leopard caught on a camera trap in Gunung Halimun-Salak National Park, West Java.
Photo by CIFOR

Hope for the endangered Javan leopard

Forests News Blog, May 2013

Age Kridalaksana, a young Indonesian ecologist in a research station nestled in the thickly forested hills of Gunung Halimun-Salak National Park in Java, gestures excitedly at his computer.

The photos displayed are crisp, the colors striking; the spotted coat and silver-grey eyes instantly recognizable as one of the park's most elusive mammals, the Javan Leopard (*Panthera pardus melas*), recently added to the International Union for the Conservation of Nature's 'Red List' of world's endangered species.

The big cats are usually extremely shy and enigmatic, but this healthy adult male, caught on a camera trap in early 2013 just two kilometers from the research station, seems to revel in his newfound fame. He stretches out, reveals his powerful canines with a huge yawn, then rolls over languidly.

'It's as if he's showing off, like he knows we are there,' Age says.

Gunung Halimun-Salak National Park covers 113,000 hectares and has some of the richest biodiversity in Indonesia. Yet, surprisingly, despite visits from scientists across the world, only a fraction of its 61 mammals species, 700 plants and 244 birds species have been extensively recorded. The numbers of Javan leopard remaining in the wild are still unknown, with estimates ranging from 250 to 700.

That is why Age and colleagues from CIFOR and the Bogor Agricultural University (IPB) are here. With assistance from national park staff, they have been monitoring the size and range of leopard populations and their prey.

This is important, says Age, in part because it helps identify potential threats, like whether hunters or poachers are in the area, and if the big cats are moving closer to areas frequented by people.

'We need to understand how human influence is affecting the distribution of leopards and other species in this area,' he added.

The presence of large predators is also an indicator of the condition of the forests, a sign that the ecosystem is balanced.

But in Java, the forests are changing. Home to half of Indonesia's population and the epicenter of the country's current economic boom, Java is losing more than 2000 hectares of rainforest a year. Large-scale forest-clearing by mining and palm oil companies, as well as small-holder agriculture and tea plantations, is eating away at what little remains.

This includes forest in protected areas. According to an IPB report, between 1989 and 2004, Gunung Halimun-Salak National Park lost 25 percent of its forest from illegal logging and forest-clearing activities.

'If you lose the habitat, then you risk losing your top predators, which can have a devastating effect on the rest of the ecosystem,' said Age. 'Monitoring leopard populations now will help the park manage them and their habitat more effectively in the future.'

For example, national park staff could scale up efforts to protect locations identified as important breeding and feeding areas. Patrols to prevent illegal hunting and encroachment could be better targeted toward areas where humans and wildlife are more likely to come into contact.

So far, the signs have been encouraging. The 30 camera traps dotted throughout the park have captured over 1000 images of barking deer (*Muntiacus muntjak*), common palm civet (*Paradoxurus hermaphroditus*), plantain squirrel (*Callosciurus notatus*), and Malaysian field rat (*Rattus tiomanicus*) — an abundance of prey for a hungry leopard.

To the delight of the scientists, two other leopards — including a relative of the Javan leopard with a black coat caused by a recessive gene mutation — were also captured on film.

'This is very impressive, considering that only a few hours away is the huge city of Jakarta, which encompasses 20 million people,' says Ken Sugimura, a Japanese scientist who leads the CIFOR project.

So far, leopard sightings and incidents of conflict with the 300 communities around the park have been rare.

'So long as their [leopard] habitat is good, I think conflict between wild animals and the surrounding community will not exist,' said Iwan Ridwan, a forestry technician at the park. ■

Village near Mount Halimun
Salak National Park, West Java.
Photo by Aulia Erlangga/CIFOR

2 – Supporting people and forests

Transporting dry litter from pine forests in North Vietnam.
Photo by Christian Cossalter/CIFOR

Poverty dilemma

2004 Annual Report

Poor people are often dependent on forests for their survival. But does that mean that forests, with their wealth of resources, can help people to pull themselves out of poverty? And if they can, then to what extent are poverty alleviation and the conservation of forests compatible? Countries like Vietnam, which is determined to reduce poverty and stem forest loss, urgently need to find answers to these questions.

In their new book 'Poverty Alleviation and Forests in Vietnam' CIFOR social scientists William Sunderlin and Huynh Thu Ba, suggest that the Vietnamese government's decision to link poverty reduction with forests in its new five-year plan makes good sense. However, there are many gaps in our knowledge. 'There is a large forestry literature which makes little mention of poverty,' said Thu Ba, 'and the poverty literature says little about forests.' This book sheds new light on the subject.

▲ Village scenery, Vietnam.
Photo by Terry Sunderland/CIFOR

During recent decades, Vietnam has undergone a remarkable transformation. By abandoning the centrally planned economy and encouraging private enterprise, relatively free trade and foreign investment, the government has dramatically reduced poverty levels. In the mid-1970s, seven out of 10 Vietnamese were classified as poor; now, the proportion is less than a quarter. However, that still means over 20 million people live below the poverty line.

'It is clear that the vast majority of the people who have risen out of poverty during recent years were only just below the poverty line before, and most

were living in or close to urban areas,' explained Sunderlin. 'There is still a very high incidence of deep poverty, most concentrated in remote and relatively inaccessible regions.' With the exception of the far north-west, where there has been rapid and recent deforestation, the highest levels of poverty tend to be found in areas which still have relatively good stands of natural forest.

The book concludes that people in remote areas tend to be poor because they lack access to markets and good infrastructure. The remoteness of these regions also means that forests have been subject to less exploitation than in the lowlands and near cities. People in remote areas are sometimes highly dependent on forests for their survival, and indeed many non-timber forest products lend themselves well to exploitation by the poor.

But does this help policy-makers design poverty alleviation strategies? 'The fact that forest resources are so important to the poor in forested areas means that they must be part of the picture,' said Sunderlin. 'We believe there is enough evidence to show that forests can play a role in improving and supporting livelihoods.' He added that more research is urgently needed if policy-makers are to gain a clear understanding of how forests can help reduce poverty.

According to Rob Swinkels, the World Bank's senior poverty economist in Hanoi, Poverty Alleviation and Forests in Vietnam has helped to kindle an important debate. 'I think its main contribution has been to get foresters to think about poverty, and poverty people to think about forests,' he said. 'It has certainly helped to inform our work with the government on the sort of policy changes which need to take place in Vietnam.' ■

Narayan Sitaula, an ACM facilitator who works for New Era, discusses forest user group in the Middle Hills of Nepal.

Photo by Carol J.P. Colfer/CIFOR

Research into empowering the disadvantaged

2002 Annual Report

Put simply, the ACM approach involves three broad processes: collaboration, learning together and collective action. There is a strong emphasis on identifying areas of uncertainty, learning as part of the management process, resolving conflicts and planning for the future together.

Traditional forestry management tends to be inflexible and autocratic, and an approach that is well-

recognized as not effectively meeting all stakeholder needs. As such, for the past two decades governments have moved increasingly to a community-based forest management approach. However, research shows that even collaborative management can isolate and disadvantage some people. A new approach — adaptive collaborative management (ACM) — is designed to address these difficulties and improve outcomes for all forest-users.

Community-based forest management in Nepal, for example, has led to improvements in the conservation of forests and the management of soil and water. ‘But there has been a negative side too,’ said Don Gilmour, a member of the international steering committee which has acted as an independent think-tank to CIFOR’s ACM program. ‘The benefits as far as improving livelihoods are concerned are not so obvious, and it seems that poor groups such as low-caste families may now have less access to forest products than in the past.’

‘The key question is: how do you implement big programs in a way that recognizes the need for social learning, for adaptiveness?’ said Gilmour. He believes that an ACM approach might do just that by focusing attention on equity, power relations and the need to involve all sectors of society in the decision-making process.

Nepal is one of 11 countries where CIFOR’s ACM research program has helped communities to reflect on their forestry problems. ‘We wanted to get away from scientists and experts dictating to people what they should do,’ explained program leader, Ravi Prabhu. ‘We wanted to find mechanisms which would stimulate forest users to work out a sustainable future for both themselves and their forests.’

When CIFOR’s Nepal ACM team began its research in the Middle Hills it was immediately apparent that most forest user groups had an autocratic management structure dominated mostly by high-caste men. Women, the poor and the lower castes were seldom consulted on forestry issues. The ACM process encouraged social learning — coming up with a shared vision and devising a monitoring system with different ethnic groups and castes discussing their perceptions and priorities in

▲ A woman carrying a basket walks by in Pokhara, Nepal.

Photo by Pablo Pacheco/CIFOR

detail. This led to the formulation of action plans that, after discussion and revision, were finalized in each user groups’ general assembly.

Many of the goals chosen by the communities will take years to realize, so it is too early to make a definitive judgment on the true value of the ACM approach in Nepal. However, initial reactions have been very positive.

Don Gilmour commented that ‘the ACM process has provided the quality add-ons that were needed in order to sustain community-based forest management. It has encouraged greater attention to issues such as equity and the building of social capital.’

For example, the Bamdibhir Forest User Group set up an income-generating group to make and sell bamboo handicrafts. The aim was to help women and the poor by selecting five members to participate in the new enterprise. However, one poor, low-caste woman was left out and she objected strongly. Using information from an equity tracking mechanism devised by the group as part of the ACM monitoring process, she managed to show that middle-income women had been favored ahead of the poor. She was subsequently given the opportunity to join the enterprise. ■

Dayak collecting fruits which have medical properties, West Kalimantan.

Photo by Alain Compost

Seeking Wide Acceptance of Tropical Plantations for Multiple Benefits

2000 annual report

Large-scale plantations have expanded rapidly in Southeast Asia over the past 15 years, as logging and deforestation have depleted natural forests that were once the region's sole source of wood for industry. A number of challenges must be overcome, however, to make plantation forests in the tropics viable and attractive to investors.

Some of the constraints stem from biophysical problems such as nutrient-poor soils and the need to restore degraded land to productivity. CIFOR's Plantations Programme conducts a wide range of research to tackle technical problems such as these. Equally important, it is addressing social and environmental factors associated with the expansion of plantations, such as conflicts between companies and local communities over access to land.

One component of research is seeking ways of making tropical plantations mutually acceptable to various stakeholders — to companies, which need the steady supply of wood; to local communities, whose residents want access to land and forest resources needed for their livelihood; and to governments and conservation groups seeking an alternative to the continuing loss of natural forests.

In Riau, Sumatra, CIFOR and Bogor Agricultural University are working with a large plantation company, PT Riau Andalan Pulp & Paper, to explore management options that would

▲ Women in Krui (Lampung) are paid to carry damar from the forest to their village, Lampung, Indonesia.

Photo by Lini Wollenberg/CIFOR

simultaneously meet timber production goals, provide local economic benefits and protect local wildlife, which includes threatened populations of elephants and several primate species.

Plantations in Indonesia are required to set aside 15 percent of their concessions as conservation areas or corridors. Yet this allows for very limited conservation of biodiversity. Adding to the problem, local people — displaced by the plantations and denied company jobs — are cutting down trees in the conservation areas and corridors, degrading wildlife habitats.

System dynamics modelling and other tools have suggested alternative ways for the company to plan and manage the corridors to reduce illegal logging while allowing local people to collect firewood, medicinal plants and other products for their livelihood. The studies have also demonstrated that conservation efforts could be strengthened at low marginal cost to the company.

In another stream of plantations research, CIFOR is continuing its work to develop effective criteria

and indicators for assessing the sustainability of plantations. These efforts are modelled on the centre's widely influential C&I for natural and community-managed forests. In 2000, a three-year C&I development and testing project at plantations in India and Indonesia ended, and the results of both case studies were published by the end of the year.

The programme also made headway in 2000 in a project that aims to ultimately help maximise the production of round wood by smallholders — known in the industry as 'outgrower' schemes. Because the competition for land in Southeast Asia and other tropical regions is intense, there is growing interest in establishing smaller scale plantations on marginal agricultural land. Through a series of case studies in Indonesia, Malaysia and the Philippines, CIFOR and several research partners have been investigating the kind of conditions and partnerships that are needed to increase support for this approach. A report on the preliminary findings of the work was under preparation at the year's end.

Batak women discussing the importance of different landscapes, Palawan, Philippines.
Photo by Manuel Boissière/CIRAD/CIFOR

The view from the forest

2006 Annual Report

All too often, the people who decide what's good for forest communities are not the communities themselves, but outsiders who have little understanding of how the communities see the world. That's precisely what's happened to the small Batak community on the island of Palawan in the Philippines. 'There have been many development projects, but they haven't always responded

to the real needs of the local people,' explained Manuel Boissière, an ethno-botanist seconded to CIFOR by the Centre de coopération internationale en recherche agronomique pour le développement (CIRAD). 'When the projects have failed, those running them have accused the Bataks of being lazy, instead of blaming themselves for their lack of understanding.'

In 2006, Boissière and CIFOR colleague Nining Liswanti joined forces with local researchers to explore the complex relationships between the indigenous Bataks and their forest environment, and their uneasy relationship with the dominant migrant communities in Tanabag District. Using Multidisciplinary Landscape Assessment (MLA), a methodology developed by CIFOR, the researchers explored what matters most to the Bataks in terms of landscape, resources and environmental services.

The forests are profoundly important to the Bataks both as a source of food and a means of earning a living. Hunting, gathering non-timber forest products (NTFPs) and swidden cultivation are practiced with great sensitivity towards the environment. But the forests — and the Bataks — are threatened by the activities of outsiders. 'They were particularly worried about people cutting trees, collecting NTFPs like rattan and honey — which provide them with an income — and fishing with poisons,' explained Boissière.

But can research such as this make any practical difference? Philippe Guizol, a CIRAD forester seconded to CIFOR, believes it can. Guizol is leading an EU-funded project, 'Levelling the Playing Field', which seeks to establish processes that will encourage rational decision-making about forest management and resolve conflicts between different interest groups. Tanabag District is one of the research sites, and it was Guizol who invited CIFOR's MLA team to provide an assessment of the Bataks' perceptions and priorities.

'The MLA exercise has given us a much better understanding of what matters to the Bataks,' explained Guizol. 'It has also revealed how marginalized they are.' As such, the MLA team recommended that researchers and decision-makers go to the Batak villagers and deal with them

▲ Shifting cultivation in the Batak village of Kalakwasan, Palawan Province, Philippines.

Photo by Manuel Boissière/CIRAD/CIFOR

alone, rather than in the company of the dominant migrant community.

The MLA research also suggests that the Bataks need to be consulted on matters which, at first sight, don't appear to involve them. For example, migrant communities are exploring ways of improving their incomes by growing crops. This may involve building a new dam which will draw its supplies from the watershed where the Bataks live. 'This means that the Bataks will need to be involved in any negotiations about downstream agricultural developments,' explained Guizol, 'and it raises the possibility that they might be rewarded for protecting the forests upstream.'

Guizol believes that the MLA research could also influence the authorities in the district capital, Puerto Princessa. 'The research has revealed how important these forests are for the livelihoods of the Bataks, and this is now recognized by the mayor,' Guizol said. He hopes that the authorities will accept that conservation should mean working with the people who live in the area, rather than expelling them from their forest homes. ■

Money does grow on trees in Sumatra

2001 Annual Report

Growing fewer trees can increase the profitability of plantations. This was the startling conclusion reached by CIFOR researcher John Poulsen in 2001.

‘Plantation managers just want to make a profit and you can’t blame them for that,’ said Poulsen. ‘Companies must think in the short term, which goes against the concept of long-term sustainability. Even so, our research shows them that they can increase the profitability of their plantations and still reduce the impact on the environment and the local people.’

As deforestation continues, tropical plantations are becoming more important as a source of industrial wood and fuel throughout the tropics. They also reduce pressure on the remaining forest. However, monoculture plantations reduce biodiversity and local peoples access to resources. So two of CIFOR’s programs, Plantations and Biodiversity, began to look at ways to balance profitable production with environmental conservation.

CIFOR capitalized on its extensive experience with tropical plantation research by collaborating with the Bogor Agricultural University and the large plantation company PT Riau Andalan Pulp and Paper in Riau, Sumatra, Indonesia. In Indonesia, plantations must set aside 15 percent of a concession as conservation area.

An oil palm plantation adjacent to intact forest in Jambi
Photo by Iddy Farmer/CIFOR

▲ Palm fruit at a palm oil plantaion in Nagan raya, Aceh province, Indonesia
Photo by Dita Alangkara/CIFOR

‘We found that setting aside 25 percent of the area as natural forest captured about 80 percent of the regional tree species,’ said Poulsen. ‘But to have any real benefits, especially for wildlife, these patches need to connect with each other.’

In new plantations, Poulsen said the natural forest that is set aside must be carefully sited and well connected by corridors of natural forest. In existing plantations, the remnants of natural forest that still exist must be conserved and reconnected. The good news is that profitability actually increased as more of the concession was set aside, up to the threshold of 25–30 percent. Corridors of natural trees created between the remnants acted as windbreaks. These protected the plantation trees from damage that was expensive to remedy. Plantation trees closer to the corridors also had much less insect damage because the corridors acted as reservoirs for predators that fed on the major pest insects. This increased production.

These two effects alone increased the profitability of the plantation, but corridors can have many more benefits. The mature vegetation in the corridors along rivers and streams reduced run-off

and sediment in the water. They can reduce fire damage to the growing trees and also stop weeds invading the plantation area. The 25–30 percent natural forest area also retained up to 90 percent of the original primate species and reduced the production risks, such as sudden outbreaks of disease, normally associated with monocultures.

As well as the environmental advantages, these effects directly benefited the local people, with the indirect benefit to the concession owners of reducing opposition to the plantations. The local people had clear water. The density of the ten most important tree species used by the local communities also increased with the area of forest corridor, so locals could continue to use the forest to collect products such as honey, firewood and medicinal plants, and hunt animals. ‘We even showed that siting corridors away from roads drastically reduces illegal logging,’ said Poulsen. ‘The impact of the work is obvious. Natural forest remnants and corridors in plantations can be used to maintain biodiversity, increase profitability, retain environmental services and minimize social tensions.’

Since the approach is cost effective and can even increase profitability, Poulsen said it would be much easier to convince the industry to adopt it. ‘The research does not argue for plantations but it deals with the real situation. Many governments will plant large-scale industrial plantations despite their possible negative social and environmental impact. So it is critical for us to work with governments and the private sector to find ways to reduce these effects,’ said Poulsen.

‘Linking long-term sustainable ways of working that conserve environmental services, yet still yield immediate economic benefits, will encourage the industry to adopt the methods.’ ■

A farmer plants sengon (*Paraserianthes falcataria*) in Central Java.

Photo by Levania Santoso/CIFOR

▲ Teak forest plantation in Jepara, Central Java, Indonesia.

Photo by Murdani Usman/CIFOR

‘Perum Perhutani had been trying to work collaboratively with local communities for many years, but without much success,’ Santoso explained. ‘The problem stemmed from the fact that the communities had little or no bargaining power and lacked the confidence to say what they thought.’

In Indonesia — the project also has sites in Malaysia and the Philippines — researchers from CIFOR, CIRAD and a local university began by encouraging each community to create a common vision and design a micro-project. This didn’t have to be forest-related; the aim was to help villagers act collaboratively, communicate better and improve their negotiating skills. Discussions were eventually broadened to include Perum Perhutani. These focused on how they could manage the forests collaboratively, to the benefit of both the company and the local communities.

In areas where state forests are located within village administrative areas, PHBM partnerships allocated 25 percent of the profits of timber harvesting to local communities. In three villages with rich teak resources, the project helped to establish new rules and regulations governing the sharing of the

benefits from the forests. As a result, the forests are now better managed and farmers’ incomes have risen significantly.

However, in one village, Glandang, the teak had all been cleared just after the fall of the Suharto regime and the villagers lacked the capital to plant trees. A third party — Accor Indonesia, the hotel group — was encouraged to join the partnership. Accor paid for the planting of some 70,000 sengon trees (*Paraserianthes falcataria*) on empty land. When the trees are harvested in 2015, Perhutani will take 40 percent of the profits, the Glandang farmers’ group 30 percent, and Accor 30 percent. The hotel group will use the profits to set up an education fund for scholarships and for replanting.

But is this any more than a successful, small-scale development project, empowering villagers with the help of an altruistic donor? According to the project leader, Philippe Guizol of CIRAD, it is.

‘There is a strong research element, which is helping us to develop indicators to monitor environmental mediation in developing countries and get a better understanding of the dynamics of collaboration,’ he said. ‘For instance, it provides interesting insights into a three-way relationship, and shows how the introduction of a third party has helped to reinforce the original agreement.’ Now that the villagers and Perhutani see how attractive the project is to outsiders, they are much more appreciative of their collaboration and determined to make it work.

‘There are lots of projects in Java doing much the same thing, in terms of empowering villagers,’ says Santoso, ‘but we have established a process which enables communities to develop a sophisticated capacity to run their own affairs. This will help us to develop guidelines which will be applicable elsewhere.’ ■

Research through development: A Javanese success story

2007 Annual Report

‘Farmers used to look up to field officers as though they were little gods,’ CIFOR researcher Levania Santoso said, ‘but now they see themselves as equal partners in a collaborative forest management scheme.’

The field officers work for Perum Perhutani, the state-owned company that manages almost 3 million hectares in Java, including 600,000 hectares of teak plantations. The scheme is locally known as Pengelolaan Hutan Bersama Masyarakat (PHBM).

In the mid-2000s, farmers from four Javanese villages involved with Perum Perhutani benefited from ‘Levelling the Playing Field’, a project managed by CIFOR and the Centre de coopération internationale en recherche agronomique pour le développement (CIRAD). The project sought to give local people the skills they needed to negotiate successful partnerships with more dominant players, such as government agencies and private companies. The aim was to make forest management not just sustainable, but fair in the sense that it recognized the demands of local people.

What Future for the Rattan Gardens of Indonesia?

2000 annual report

Haji Sulaiman lives in an area of South Kalimantan, Indonesia, where villages have cultivated rattan for a century or more. As in a lot of the local households, rattan production offered him and his family a good living. Heavy demand from Japan made the manufacture of rattan mats (lampit) an important home industry, and Sulaiman even invented a machine that cuts holes in split rattan, which earned him a major government award.

In 1987, encouraged by the local government, he borrowed money to expand production. By 1991, however, he was bankrupt and his lampit business was closed, while the debt remains to be paid off.

His situation reflects the dramatically uneven status of rattan production in Kalimantan, and Indonesia overall, over the past two decades. Once a critical source of livelihood for many small farmers, rattan 'gardens' have been undermined by very low prices. The lampit industry, for which Indonesia was once the main supplier, has virtually collapsed.

A consortium of researchers from CIFOR and several partner organisations has been studying the dynamics that made the once thriving rattan gardens now a marginal economic activity in many areas. A combination of factors is involved.

▲ Rattan trader in Muara Siram, East Kalimantan, Indonesia.
Photo by Ramadhani Achdiawan/CIFOR

Beginning in the 1980s, the government introduced a series of policies that banned the export of rattan and restricted foreign investment in rattan manufacturing, ostensibly to protect the resource and promote a domestic processing industry. The ban sharply decreased prices and demand; raw material prices have changed little in nominal terms since 1987, and have decreased in real terms. Local rattan producers lost, while the artificially low prices gave domestic processors essentially a subsidy for the cost of raw material.

Meanwhile, many rattan gardens have been displaced by plantations and other land uses, farmers are shifting to different activities and widespread forest fires have destroyed large areas of rattan.

The scientists are working to determine what policies and conditions might reverse the clock and once again make rattan gardens an attractive means of livelihood, especially in villages where the people have few income alternatives. Could a revival of the industry be supported, and if so, how? Or are rattan gardens basically outdated and uneconomic in today's changing environment?

Ecological benefits are cited among the arguments in favour of restoring rattan gardens, which usually exist within larger forest ecosystems. 'Rattan gardens are of high importance for biodiversity compared with oil palm or rubber plantations', explains CIFOR researcher Rita Mustikasari, who is conducting rattan studies in several provinces of Indonesia. 'Rattan is a climbing plant that needs big trees in which to grow'. Thus, rattan gardens function as secondary forests that provide habitat for many different forest products.

In social terms, rattan gardens also offer a number of benefits. They are a form of 'savings plan' for many villagers, who can harvest them when needed as a source of ready cash for school fees, emergencies or other household needs.

In a paper presented at an international workshop in 2000, the researchers argue that the rattan gardens of Kalimantan are basically resilient and 'could be more economically competitive if provided with a level playing field'. Among the policy reforms they suggest is reducing barriers that have depressed prices for the raw material. ■

Rattan farmer, East Kalimantan, Indonesia.
Photo by Brian Belcher/CIFOR

Land-use planning meeting, Laos.
Photo by Jean-Christophe Castella/CIFOR

Swidden cultivation landscape in the Nam Khan River basin, Northern Laos.
Photo by Guillaume Lestrelin/IRD

Role-playing and 3D mapping help communities get involved in landscape planning

2012 Annual Report

Well-intentioned plans are too often abandoned and forgotten when villagers are left out of the land-use planning process.

Conversely, by placing a 3D map (complete with familiar landmarks) in the middle of a table and asking residents what they would do as a developer, conservationist or village leader, it suddenly becomes easier to incorporate local views into the process.

This role-playing tool, devised by CIFOR scientists and partners, helps village communities see the long-term advantages of careful landscape management. The method was initially tested in 2011 in 28 villages that border the Nam Et – Phou Loey National Protected Area in Laos, one of the few remaining sanctuaries for tigers in the country. 3D mapping has since been picked up by 10 different districts and is being implemented in about 300 villages.

The results, so far, are very promising, said Jean-Christophe Castella, one of the researchers.

In the past, villagers often ended up implementing plans that they did not understand and that were doomed to fail. ‘In former styles of land-use planning meetings, local people would usually just sit at the back of the meeting room waiting for it to end,’ Castella said.

When leaders from all of the local villages are in the same room together, demarcating their borders on the 3D maps, they are able to resolve territorial disputes and arrive at a group consensus, he said.

The learning tools address barriers such as the language gap between planners and communities, low map and reading literacy, and limited community understanding of the impacts of land-use plans. The meetings also help train local people in negotiation skills so they are better equipped to discuss future land use and resource management plans in their area.

Mr Monsay Laomouasong, the Governor of Viengkham district in Luang Prabang Province, where the initial trials took place, was pleased with the results so far. ‘This approach puts the keys of development in the hands of local communities and avoids engaging them in endless assistance programs,’ he said. ■

Something for (almost) nothing in Kalimantan

2001 Annual Report

In west Kalimantan, local villagers have been producing valuable charcoal from trees that grow untended in abandoned areas. *Vitex pubescens*, a tree that springs up on land after fires or on abandoned farms, yields a charcoal that is as good as that from mangrove trees. Rice does not grow well on the land and farmers find weeding the rough fields too labour-intensive. But establishing small local industries to grow *Vitex* for charcoal offers a way of making the land productive again.

The idea of developing a *Vitex* industry originally came in the late 1990s from a local NGO, said CIFOR researcher Wil de Jong. 'We work with Yayasan Dian Tama (YDT) and they involved the local Tanjungpura University in Pontianak to explore how the local farmers can best profit from these grasslands,' he says.

The collaboration capitalized on the strengths of each partner to multiply its impact. YDT is the pivotal organization; they run the research with the university and CIFOR collaborated to provide the scientific input. YDT used the good rapport they had with the local people and their contacts in the regional government; CIFOR made connections to outside parties. ACIAR funded the project.

A *Vitex pubescens* sapling grows in the midst of *imperata* grass

Photo by Wil de Jong/CIFOR

▲ Villagers unload a kiln

Photo by Yayasan Dian Tama

The technology needed to produce the charcoal is relatively simple and inexpensive; at most, communities have to invest in constructing kilns. After four years, one hectare of *V. pubescens* could yield up to 18 tonnes of charcoal, which would earn farmers several hundred dollars when sold to charcoal factories in Pontianak, the closest city.

Four villages participated in field trials, helping researchers answer questions about planting methods, seed stock, fertilizer requirements and labor needs. Recognizing the strong market potential, farmers worked with the researchers to find ways to cultivate the trees in small plantations and the best way to produce the charcoal. The activity was very attractive to swidden farmers in West Kalimantan because it allowed them to grow the tree alongside their regular fields without much

extra work. Another advantage is that *V. pubescens* tolerates fire much better than many other tree crops, reducing the risk that farmers will lose their investment. A positive side effect is that the trees actually form a barrier to the wildfires that plague the area.

'This research is improving the life of the community, so I am making an effort to disseminate the positive impacts of these activities to a large number of parties,' said Donatus Rantan, leader of the project at YDT.

Apart from its local impact, the collaboration has greater potential. These grasslands are common in Indonesia and other countries, so the results of this work will have wide-reaching implications, said de Jong. ■

In China, Bamboo Grows More and More Important

2000 annual report

The bamboo industry in China has grown fourfold in only 15 years, bringing considerable social and economic changes. Since 1994, CIFOR and scientists from several forest research institutions in China have been conducting the most in-depth study ever done of bamboo production in China and how it supports rural development. The results have proven so useful that Chinese officials have consulted the scientists repeatedly on policy questions and technical aspects of bamboo production.

The project had been scheduled to end in 2000. But growing concern about the environmental effects of the rapid bamboo expansion led instead to the launch of an additional phase of research to examine that issue. A new national partner in China, the Department of Science and Technology of Zhejiang Province, has joined the project, which aims to determine what policy interventions will allow continued economic development from bamboo without destroying the environment. The findings have widespread implications because as many as 5.6 million Chinese depend on the bamboo sector for full- or part-time work.

The newest phase of the project builds on research that began in China's Anji County in the 1990s as part of broader research to better understand bamboo production, processing and marketing under different conditions. About a third of the mountainous county, which is in Zhejiang Province,

is covered in bamboo, and almost two-thirds of all households grow at least some bamboo along with other crops.

Bamboo is often viewed as a secondary product, or 'poor man's timber'. So the scientists were surprised to find that bamboo production in Anji County was booming — by as much as 50 percent in places, making some farmers relatively rich. The research linked the dynamic situation with a spate of policy changes China had been introducing since 1978, involving land reform, trade liberation and free-market measures. Farmers were given greater control over what and how much to produce, while new investment and export policies stimulated both domestic and international demand for bamboo products.

Comparing the situation with conditions in areas where the levels of policy reform and socioeconomic development varied, the research team learned that a significant factor determining how much local people benefited from bamboo production was what kinds of products they produced. In general, farmers in China had traditionally produced raw bamboo (culms) for the pulp and paper industries, with processing left to the state. Under the reforms, many areas diversified into higher value products such as bamboo shoots, which brought some households unusually high incomes.

The strong demand for bamboo and bamboo products undoubtedly will continue. Recent government restrictions on the logging of natural forests in China have given rise to expanded markets for panel board, flooring and other bamboo derived building materials.

To take advantage of the boom, people in some areas have been cutting down natural forests and

▲ Bamboo farmer, Tianlin County, China.
Photo by Nick Hogarths/CIFOR

other vegetation to plant bamboo. Because most of China's forests are on hillsides, erosion has increased. The monoculture nature of intensive bamboo production has also raised mounting concerns about potential biodiversity loss, the increased use of fertilizers and other ecological risks. The latest phase of research will examine environmental issues such as these and potentially helpful policy reforms. Findings from this project and other studies in China are providing new insight into the extensive reforms in China since 1978 and their impact on the country's forests. ■

Farmer with bamboo harvest.
Photo by Manuel Ruiz Perez/CIFOR

Women add finishing touches to wooden furniture made in a small workshop in Jepara, Central Java.
Photo by Murdani Usman/CIFOR

Research in support of the furniture industry

CIFOR Infobrief, June 2013

Abdul Latif, the son of farmers in Sinanggul village in Mlonggo, Jepara, has been working in the furniture industry since he graduated from high school about 16 years ago. A graduate from a language academy with a major in English, Latif now owns and manages a small furniture-making

workshop in his hometown. He officially opened his business, CV Mebel Jati Jepara, on 13 October 2011. He has 10 regular employees, and takes on up to 60 employees when orders are at their peak. His main orders now come from Europe, especially France.

Latif joined the Jepara Small-scale Furniture Producers Association (APKJ) in 2010, which was initiated as part of the Furniture Value Chain (FVC) project run by CIFOR and supported by the Australian Centre for International Agricultural Research. Born out of research carried out in collaboration with Indonesia's Forestry Research and Development Agency, the Faculty of Forestry of Bogor Agricultural University, Jepara District Government and the University of Melbourne, APKJ sought to build the capacity of Jepara's small-scale furniture makers by conducting training in various areas, including business management and online marketing.

Through his participation in this association, Latif has been able to broaden his network and increase his access to market information. His involvement also exposed him to the Indonesian government's Timber Legality Assurance System (TLAS) and its implementing regulation.

To comply with the requirements of this new regulation, Latif kept records of his suppliers' business documents and his company's transactions. Usually, small-scale furniture producers do not record their business transactions because of poor management practices and the multiple tasks that owners must perform. The TLAS compliance process taught him that business administration is as important as meeting deadlines for orders, and he has since recruited a manager.

The process was difficult, he reported, because of the number of criteria and his unfamiliarity with the system. But it paid off: on 4 April 2013, his company was granted a legality certificate under the TLAS, making him the first small-scale furniture producer to achieve compliance.

APKJ has emerged as an effective forum for improving its members' capacity to manufacture better-quality furniture, to deal with management issues and to reduce the time to delivery. APKJ has also improved cohesion among small-scale furniture producers and acts as a forum where they can interact, broaden their influence and set targets. APKJ has been able to negotiate with other associations in Jepara, such as the Indonesian Furniture Industry and Handicrafts Association and the Jepara Wood Traders Association. The Jepara District Head has acknowledged the important role of APKJ.

Members of APKJ stated that since joining, they have been exposed to greater opportunities either through improved market access or through the adoption of innovations, such as the use of an internet portal to market their furniture. Half of the APKJ champions accessed loans from Bank Rakyat Indonesia after participating in a financial training course run under the FVC project. Loans granted were in the range of 10–50 million Indonesian rupiah.

In particular, the 120 members of APKJ have noticed economic outcomes related to the project and the association. An impact assessment that compared the performance of members and non-members found that more members are improving in several aspects of their business. In total production, sales and profits, more than 85 percent of APKJ members had seen improvements in the 5 years before the study, compared with only 60–74 percent of non-members.

Under the FVC project, a strategic plan for the furniture industry in Jepara was also created. This plan, titled 'A roadmap for the furniture industry 2013–23', is designed to guide the development of the furniture industry in Jepara, and Jepara District Regulation on this has been drafted. ■

Scientists gather mangrove samples for weighing in a study on above-ground and below-ground biomass in mangrove ecosystems, part of the Sustainable Wetlands Adaptation and Mitigation Program (SWAMP), Kubu Raya, West Kalimantan, Indonesia.
Photo by Kate Evans/CIFOR

3 – Research for more effective policies

Acacia mangium logs harvested from the PT Riau Andalan Pulp and Paper concession area in Kampar District, Riau.
Photo by Ryan Woo/CIFOR

Studying the impacts of forestry research

2010 Annual Report

In the late 1990s, CIFOR researchers identified a major problem for Indonesia's natural forests: pulp and paper companies were expanding their processing capacity at a much faster rate than they were bringing plantations online.

CIFOR's research, led by policy scientist Chris Barr, provided civil society organizations with the data and analysis they needed to campaign

for reforms of the pulp and paper industry. The Ministry of Forestry introduced a decree to increase the rate at which pulpwood plantations were established. As a result of these and other measures, companies such as Asia Pulp & Paper (APP) and Asia Pacific Resources International Ltd (APRIL) began to increase the areas they set aside for conservation and to accelerate their plantation programs.

In the mid-2000s, CIFOR impact assessment scientist David Raitzer further investigated the extent to which this research has led to changes in behavior and policy by looking at three main pathways: increases in the area of forest land set aside for conservation by companies; increases in the use of fiber from plantations; and the extent to which companies did not expand their processing capacity as a result of CIFOR's research. He interviewed 31 informants in the industry, government and civil society, and they confirmed that Barr's research has had a considerable influence.

For example, APP and APRIL have set aside large areas of forest land for conservation. They have also rapidly increased the amount of land under plantations, partially as a response to the ministerial decree, and partially as a response to the demands of buyers and creditors influenced by advocacy. APRIL officials credited CIFOR and advocacy by non-governmental organizations (NGOs) with virtually all improvements in sustainability made since 2001; and the NGOs confirmed that Barr's research was essential to obtaining environmental commitments from APP and APRIL.

In Papua, CIFOR's research contributed to a reconsideration of the extent and pace of land being allocated for oil palm and timber plantations, as communities learned more about their social, environmental and economic impacts.

Boven Digoel is a district in Papua province that had become a target for investment in oil palm plantations and industrial timber estates. CIFOR's research there, published in 2011, found that oil palm development contributed to the economy through tax revenues and employment. However, the plantations were perceived to cause significant environmental damage and conflicts over land.

As a result of CIFOR's study, the Boven Digoel district government postponed authorization of large-scale initiatives until more is known about how to manage their impacts.

CIFOR research also contributed to a reduction by nearly two-thirds of a plan to convert 2 million hectares of indigenous people's land into an industrial agriculture and biofuels estate in Papua's Merauke District. The research, which involved consultations with villages and participatory mapping of the land by local communities, helped to resolve existing conflicts between clans over land tenure. The research outputs have been used extensively by tribal leadership to inform their participation in discussions related to large-scale land acquisition for timber plantations and other estates. The leader of the Malin-Anim tribal community sent a letter to CIFOR indicating that the project greatly improved their understanding of the value and fragility of their natural resources, and strengthened their resolve in negotiations with plantation investors.

The campaigns and reforms that benefited from CIFOR's research helped to save large areas of pristine forest from destruction, either directly through conservation commitments, or indirectly through the substitution of plantation wood for natural forest wood and the reduction in demand for wood from natural forests. This has protected biodiversity and valuable watershed services, such as the provision of clean water for agriculture and human consumption. It has also ensured that large quantities of carbon that would have been released into the atmosphere, had the forests been felled, remain safely locked up. Indeed, the main economic benefits of CIFOR's pulp and paper research largely derive from the reduction in carbon emissions through averted forest loss. ■

Collecting debris of Chinese fir (*Cunninghumiana anceolata*) for firewood.
Photo by Christian Cossalter/CIFOR

Community forestry and devolution

2003 Annual Report

Giving local people a greater say in forest management

Virtually every developing country has introduced devolution policies for its natural resources. The rationale for devolution is relatively simple. By transferring the authority to manage natural resources such as forests to local communities,

central governments aim to cut costs. At the same time local communities should gain better access to the resources they need and have a greater say in how they are used. Local involvement should mean that the forests are better managed, as they are being looked after by people who are close to the resource and have a strong vested interest in its survival.

This is the theory. In practice, however, devolution has often failed to deliver what it promises, as a three-year study in Asia, coordinated by CIFOR and commissioned by the International Fund for Agricultural Development (IFAD), has revealed. ‘One of our key findings,’ explained Eva Wollenberg, co-editor of *Local Forest Management: The Impact of Devolution Policies*, ‘is that when forest departments promote devolution they promote their own interests in timber production and forest conservation, often to the detriment of local communities.’

A team of researchers analyzed the impact of devolution in China, India and the Philippines. Community control and access to forest products increased most in China. Here devolution provided some villagers and farmers with significant benefits and greater authority to manage forests and harvest forest products. In China devolution has led to an increase in forest area, and forest departments were found to be generally sympathetic to villagers’ needs, although little attention was given to the unequal impacts of devolutionary policies.

A very different picture emerged from India, where the reality of devolution has not matched the rhetoric promoting it. The researchers found that in some states the forest departments have actually used Joint Forest Management — one of the instruments of devolution — to gain greater control of the forests.

Take, for example, Orissa. Here non-timber forest products contribute up to 40 percent of rural household income, and forests are critical to the welfare of the rural poor. Over many decades, local communities have responded to forest degradation by setting up their own community forest management mechanisms. These have often been very effective and helped to restore degraded forests, although their existence has generally been ignored by the state authorities.

▲ Non-timber forest products are particularly important for impoverished, predominantly tribal forest-dwellers in India. Women may earn a significant portion of household income by stitching plates made out of sal leaves. Recent moves by the Forest Department in Orissa to clamp down on the sal-leaf trade could adversely affect the poor.

Photo by Charlie Pye-Smith/CIFOR

When Orissa introduced Joint Forest Management in 1993, it stipulated that 50 percent of the income from forests should go to the Forest Department and the rest to committees which it established. As far as the villagers were concerned, this meant that they were forced to relinquish half their forest-related income. And instead of local communities determining how best to manage the forests, as they had in the past, the Forest Department began telling them what to do.

‘Devolution policies promoted through forest departments are ultimately limited by the departments’ bureaucratic structures and mandates,’ suggested Wollenberg. ‘Instead of only going through forest departments, donors need to think about supporting agencies with the capacity to empower communities. They should also support community groups and NGOs working on their behalf, and community federations such as the ones that exist in Nepal and Orissa.’ ■

Aerial view of a river in Papua.
Photo by Mokhamad Edliadi/CIFOR

Decentralization: Good for the forests?

2004 Annual Report

When the Indonesian government embarked on a program of decentralization in 1999, there were high hopes that the shift in power away from the center would make decision-makers more accountable to the public, render the whole business of government more transparent, and lead to better and more equitable resource management. The extent to which these hopes have been realized was explored by a two-year project

in the early 2000s: ‘Can decentralization work for forests and the poor?’

The project, carried out in five provinces, was run as a partnership between CIFOR, FORDA, and universities and NGOs in the provinces. The Australian Centre for International Agricultural Research (ACIAR) and the UK Department for International Development (DFID) funded the project.

In Jambi, the project found that there had been very little public consultation during the drafting of forest-related local regulations, leading to increased conflict between local communities and companies involved in plywood and pulp production. As a result, the local government agreed that there should be greater public consultation during the drafting of new laws, and asked CIFOR and its research partner to provide support.

In South Sulawesi, the research raised awareness about the problems associated with revenue sharing and deforestation. As a result, the District Head’s office pledged significant funds for a local forestry development project to implement the research findings. In East Kalimantan, the research inspired local stakeholders to establish a multidisciplinary working group on forest and land rehabilitation, with support from the head of the district.

In Papua, the project led to the production of a documentary film, *Suara Masyarakat Papua* (The Voice of the People), in which local villagers shared their views about how forest management could work in favor of the poor. The film was shown to wide acclaim at the Jakarta International Film Festival, the 3rd Congress of Papua’s Adat Council and the World Conservation Congress in Bangkok.

Partly based on the findings of this project, CIFOR published *Decentralization of forest administration in Indonesia in 2006*, which makes it clear that decentralization had few benefits as far as forests were concerned. In many provinces, the pace at which forests were being cleared — either legally or illegally — increased when district governments were given the power to allocate small-scale logging concessions.

‘Decentralization happened very quickly and it was poorly planned and poorly implemented,’ CIFOR policy scientist Chris Barr explains. ‘There was certainly a transfer of authority from the center to the districts, but many of the governance problems that were apparent when the center managed the forest estate have simply been replicated at the local level.’

While decentralization led to a significant increase in local government receipts from forestry activities, the local communities, who have most to lose when forests disappear, often received little or no payments for the exploitation of ‘their’ forests. However, decentralization has at least helped to make local communities more visible. ‘In the past, during the Suharto era, they were completely ignored,’ explains CIFOR social scientist Moira Moeliono, ‘but now their voices are being heard. They are no longer docile, as they were in the past, and both local and central governments now recognize that the issue of community land rights needs to be addressed.’

There are some significant lessons to be learned from Indonesia’s experience and the book offers a number of recommendations. If Indonesia is to avoid a ‘tragedy of the commons’, governments at every level will need to move beyond the ongoing tug-of-war over the economic rents associated with timber production. Instead, say Barr and his co-authors, they must focus on how responsibility for managing existing and degraded forests should be shared so that the forests, and those who depend on them for their livelihoods and survival, benefit both now and in the future. ■

Shifting the balance of power

2008 Annual Report

Local communities are often threatened by the activities of outsiders, and all too frequently their needs and opinions are ignored. This often leads to conflict. The 'Levelling the Playing Field' project has explored how local communities can compete on an equal footing with more powerful groups, such as plantation companies and government ministries. According to an independent evaluation, the project has successfully developed a system of mediation that can shift the balance of power in forested areas.

The 4-year project, jointly managed by CIFOR and the Centre de coopération internationale en recherche agronomique pour le développement (CIRAD), helped to broker environmental agreements among local communities and more powerful players, such as government ministries and private companies, at six sites in **Indonesia, Malaysia and the Philippines**. In each country, a local university was involved in the research.

'Although the issues varied from site to site, the approach was always the same,' said project leader Philippe Guizol. 'It involved giving local people the skills and confidence needed to work together and negotiate partnerships with outside groups.'

Local people were encouraged to identify their priorities, develop small-scale projects to gain experience in acting collectively, and establish democratic organizations to represent their interests. They then entered negotiations with the companies or government departments managing local resources, and developed written agreements on how to manage the resources in the future and how to share the benefits.

▲ Measuring mangrove areas in the Hutan Bakau Pantai Timur reserve, Indonesia.

Photo by Petrus Gunarso/CIFOR

The project significantly improved forest management and local incomes at several sites. For example in four villages in Java, farmers' organizations were encouraged to negotiate a deal with Perum Perhutani, a state owned company that manages 600 000 hectares of teak plantations. In the past, the company had tried to work with local villages but with little success, largely because the villagers had little bargaining power and were reluctant to make their voices heard.

The negotiations led to establishing new rules, defining the rights and duties of each partner, and agreeing how to share the benefits from the teak plantations. For example, three of the four villages now receive 25 percent of the timber revenue, whereas in the past they received nothing.

'In Java, at the Perum Perhutani site, we arrived at just the right time,' Guizol said. 'Both the local people and the company were fed up with conflicts over the plantations and the company was keen to engage constructively with local villagers.'

The independent evaluation concluded that the research at all six project sites sent out the same message: that sustainable forest management is only likely to be achieved with the participation of local communities. If there is conflict, it is much harder to manage forests and plantations well.

Guizol said that the methodology developed by the Levelling the Playing Field project could prove particularly useful if, as anticipated, countries rich in forests host a wave of projects designed to tackle climate change by reducing emissions from deforestation and forest degradation (REDD).

'If REDD projects are going to succeed,' said Guizol, 'then it's vitally important that local communities are not marginalized and that projects don't create conflicts by threatening their livelihoods. One way of doing that is through environmental mediation of the sort we've developed with Levelling the Playing Field.'

Web links: http://www.cifor.cgiar.org/lpf/_ref/index.htm. ■

Old teak trees in Cepu, Indonesia.

Photo by Christian Cossalter/CIFOR

Influencing plantation policy

2005 Annual Report

Research by CIFOR scientists Christian Cossalter and Chris Barr, described in the 2004 Annual Report, examined China's ambitious program to develop a plantations-based wood-pulp industry. The researchers found that although the Chinese government was encouraging the development of some 6 million hectares of fast-growing pulpwood plantations, there would be significant shortfalls in domestic supply for some time to come. This meant China was likely to continue importing wood fiber, possibly harvested from natural forests in countries like Indonesia.

In 2005, the researchers were invited by the World Bank to conduct a more detailed analysis of plantation development and industrial wood demand in just one province, the Guangxi Zhuang Autonomous Region. The research, a collaborative effort between CIFOR, the Guangxi Provincial Forestry Bureau and the Guangxi Forest Survey and Design Institute, has had a significant influence on a major World Bank loan for plantation development.

'During recent years, the province has seen a rapid expansion in its production of both fiberboard and paper, mirroring the trends throughout China as a whole,' explained Cossalter. Since the mid-1990s, China's production of medium-density fiberboard, or MDF, has risen some 30-fold, and Guangxi is now one of the largest producers. China has also dramatically increased its pulp and paper production; once again, Guangxi has been a significant player.

A plantation of Chinese fir, *Cunninghamia lanceolata*, in Zhejiang, China.

Photo by Christian Cossalter/CIFOR

▲ Transporting logs of Chinese fir (*Cunninghamia lanceolata*), Xiayang Forestry Farm, China.

Photo by Christian Cossalter/CIFOR

'On paper, you might expect the fiberboard and wood-pulp industries to be competing for the same wood supply,' said Cossalter, 'but our research showed that they are tapping into different resources.'

This is because some 90 percent of the MDF is manufactured for the local market, where price matters more than quality. MDF manufacturers use small, low-quality products that come from wood waste and from thinning pine plantations. In contrast, producing high-quality paper requires high-quality pulp produced from larger diameter eucalyptus logs. So there is little overlap in demand.

The worrying news for the MDF industry, highlighted by the research, is that the rapid growth of a modern paper industry in Guangxi is leading to a rapid expansion in eucalyptus plantations, and these are frequently being established on wasteland and old pine forests — the very resource on which the MDF industry depends.

These and other findings of the research have encouraged the World Bank to revise the specifications for its USD 100 million loan to the Guangxi Forestry Bureau. Originally, the intention was to use most of the loan to establish new eucalyptus plantations. 'As a result of the research, the focus has now changed,' Cossalter explained. 'The amount of land which will be devoted to eucalyptus has been cut by half, and the new plantations will not only serve the pulp and paper industry but other sectors such as the MDF manufacturers as well.'

The Guangxi Forestry Bureau had originally planned to spend most of the loan on state farms, but there will now be a much stronger focus on providing assistance for farmers and village groups to establish new plantations. This will be of considerable benefit to local livelihoods in some of the poorer rural areas. This is a good example of research that really makes a difference. ■

A police officer stands guard as others check one of 62 confiscated containers of illegal timber, at Tanjung Priok port.

Photo by Mast Irham/EPA/Corbis

Reducing money laundering in the forestry sector

2008 Annual Report

Illegal logging costs governments some USD 15 billion a year in lost assets, lost revenues and unpaid taxes. Tens of thousands of people are involved in felling and transporting illegal timber, but most of the profits end up in the hands of a few big players, who launder their

ill-gotten gains through the banking system. Research by CIFOR financial analyst Bambang Setiono has raised awareness about the close links between money laundering and forest crime.

It has been clear for many years that the forestry laws in Indonesia, though adequate on paper, have failed to have a significant impact on the hugely profitable trade in illegal timber. Setiono recognized that a new approach was needed. Illegal loggers, like drug traffickers, need to convert the profits they make into assets that have a veneer of respectability, such as real estate, stocks and shares, or oil palm plantations.

Working closely with Yunus Husein, then the head of the Indonesian government's Reporting and Financial Transaction Analysis Centre (PPATK), Setiono proposed that banks should be required by law to inform the government of any suspicious transactions. In 2003, the government introduced a new law, classifying forestry and environmental crimes as 'predicate offences' for money laundering charges.

In 2004, Setiono and Husein managed to get illegal logging onto the agenda of the Asia/Pacific Group on Money Laundering (APG).

'Before this, the APG had focused its attention on traditional money laundering offences, such as drug dealing, currency smuggling and people trafficking,' Setiono said. 'But at an APG workshop in Brunei, we highlighted the significant role money laundering plays in illegal logging.' Following the workshop, the APG asked PPATK to organize a special working group on illegal logging to help member countries in the region to introduce and enforce anti-money laundering laws.

The APG Typologies Report published in 2008 included a section on anti-money laundering and illegal logging for the first time. The message was clear: 'Effective money laundering legislation and preventive measures provide strong tools to detect

the profits and investigate and prosecute the persons behind illegal logging and prevent financial markets from abuse,' the report said.

Besides influencing the APG, Setiono's research has had a significant effect on other organizations. For example, the World Bank began taking the issue more seriously and the Indonesian Working Group on Forest Finance started helping to raise awareness about the significance of Indonesia's money laundering law. The Indonesian police and PPATK have used the law to investigate several cases of illegal deforestation, and in 2008 it led to the conviction of one of Indonesia's leading timber barons.

In 2009, the Central Bank of Indonesia put in place a regulation requiring commercial banks to implement anti-money laundering programs. But it became clear that the banks needed assistance in implementing this regulation. CIFOR quickly stepped in to help and recommended procedures for banks to apply due diligence mechanisms for customers operating in forest-related businesses.

The recommendations stress that banks need particularly to monitor financial transactions related to the forestry sector and to ensure the identity of the real owners of forest-based companies. They also specify the documentation that should be requested by banks to substantiate claims made by companies regarding the sources of their revenues, including the use of geographic information system technology.

These recommendations were followed up in 2010 with the development of guidelines for law enforcement and audit agencies on how best to crack down on money laundering and corruption in the forestry sector. The guidelines were published in 2011. ■

Staff receive training in tracking timber, in Berau, East Kalimantan.
Photo by Agung Prasetyo/CIFOR

A future for Indonesia's forests?

2005 Annual Report

Indonesia's forests are disappearing at an alarming rate. Every year, timber-related industries consume the equivalent of some 50–60 million cubic meters of round wood. Yet the sustainable yield from natural forests earmarked for production is around 8–9 million cubic meters a year, while plantations currently yield less than that. Another 7 million or so cubic meters are probably harvested legally — but not sustainably — from land cleared for new plantations. This still leaves an enormous gap

between demand and legal supply. The result is rampant illegal logging, significant loss of income for government and the destruction of resources used by local communities.

In 2005, Indonesia's Ministry of Forestry, CIFOR and DFID's Multistakeholder Forestry Programme (MFP) collaborated on a report on industrial revitalization — one of the five priorities identified by the Ministry for the period 2004–09.

‘Three significant studies had already been undertaken during the previous year, related to timber supply and the need to restructure the country's timber industries,’ explains CIFOR policy scientist Chris Barr, ‘and senior managers at the Ministry of Forestry asked us to provide a synthesis of their findings and recommendations.’

Working closely with FORDA, the Ministry's research branch, CIFOR gathered together analysts who had been involved in the three studies and hired economist Timothy Brown to coordinate the work of the synthesis team. The team decided to present its findings in the form of future scenarios.

‘Researchers have been telling policy-makers for years that the country is losing 2 million hectares of forest a year, but this hasn't had great impact,’ explains Brown. ‘We decided to look forward and use economic arguments to show what the implications of these losses will be in 10 or 20 years — for the industry, employment, tax revenues and the landscape.’

The synthesis team came up with three contrasting scenarios. The first of these — business-as-usual — shows that if current trends continue, illegal logging, forest degradation and declining industrial output are inevitable. The second scenario envisages an increase in plantations and imports. This is an improvement on the business-as-usual scenario, but even with a strong plantations program and a significant increase in imports, illegal logging will continue to be a major problem for at least another 15 years.

The third scenario — favored by the authors — envisages an increase in both plantations and imports, accompanied, crucially, by significant restructuring of the industry's processing capacity.

▲ Hills scenery at Situ Gunung, West Java, Indonesia.
Photo by Ricky Martin/CIFOR

This shows that illegal logging can be brought under control within a reasonably short period of time, but that will only happen if timber-dependent industries reduce their production.

When the report was presented by FORDA to Minister M.S. Kaban in September 2005, it was warmly received. According to David Brown, an economist with MFP, the Minister recognized that the report represented a credible, quantitative assessment of Indonesia's timber industry, and the need to restructure it.

At the meeting it was agreed that CIFOR, FORDA and MFP would organize a national seminar on forest-industry restructuring. This was held in Jakarta in December 2005, and among those who attended were representatives from the ministries of forestry, industry and trade, as well as key individuals from five provincial forestry offices, various industry groups, civil society organizations and donor agencies. ■

This volume showcases a snapshot of CIFOR's 20-year journey with Asia, its forests, and its forest dwellers. It is a celebration of the positive impact that science, knowledge, and collaboration has had, a reminder of the challenges that remain, and a symbol of CIFOR's continued commitment to rigorous, collaborative and innovative research. We welcome the next 20 years of CIFOR in Asia.

RESEARCH
PROGRAM ON
Forests, Trees and
Agroforestry

This research was carried out by CIFOR as part of the CGIAR Research Program on Forests, Trees and Agroforestry (CRP-FTA). This collaborative program aims to enhance the management and use of forests, agroforestry and tree genetic resources across the landscape from forests to farms. CIFOR leads CRP-FTA in partnership with Bioversity International, CATIE, CIRAD, the International Center for Tropical Agriculture and the World Agroforestry Centre.

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